

# **Development at West Kowloon Cultural District**

**Monthly Environmental Monitoring and Audit (EM&A) Report  
for January 2021**

**08 February 2021**

In accordance with the Environmental Permit, Condition 3.4, this Monthly EM&A Report has been certified by the Environmental Team Leader (ETL) and verified by the Independent Environmental Checker (IEC) as complying with the requirements as set out in Sections 1, 10, 11, 12 and 13 of the EM&A Manual.

**Certified by:**



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**CK Wu**

Environmental Team Leader (ETL)

West Kowloon Cultural District Authority

**Date**

10 February 2021

**Verified by:**



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**Claudine Lee**

Independent Environmental Checker (IEC)

Meinhardt Infrastructure & Environment Ltd

**Date**

10 Feb 2021

This Report Consists of :


**Part-1: EM&A at M+ Museum and  
Lyric Theatre Complex**

**and**

**Part-2: EM&A for Foundation, Excavation  
and Lateral Works for Integrated  
Basement and Underground Road  
in Zone 2A**

# **Part-1: EM&A at M+ Museum and Lyric Theatre Complex**





## M+ Museum and Lyric Theatre Complex

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# Executive summary

Mott MacDonald Hong Kong Limited (MMHK) was commissioned to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for the construction of M+ Museum Main Works (Contract No.: CC/2015/3A/022) and Lyric Theatre Complex including the Foundation Works (Contract No.: CC/2015/3A/014), L1 Contract (Contract No. CC/2017/3A/030) and L2 Contract (Contract No. CC/2017/3A/031) at West Kowloon Cultural District (WKCD) (The Project) as part of the WKCD development. The Project Proponent is the West Kowloon Cultural District Authority (WKCDA). The construction works and EM&A programme for M+ Museum and Lyric Theatre Complex commenced on 31 October 2015 and 1 March 2016 respectively.

The overall works for the WKCD fall under two separate categories of Designated Project (DP) of the Environmental Impact Assessment Ordinance (EIAO), namely an “engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100 000” (Item 1 of Schedule 3) and “an underpass more than 100m in length under the built areas” (Item A.9, Part I, Schedule 2). An Environmental Permit No. EP-453/2013/B (EP) was issued with respect to the “Underpass Road and Austin Road Flyover Serving the West Kowloon Cultural District” which specifically includes the abovementioned category of DP under Item A.9, Part I, Schedule 2 of the EIAO.

This Monthly EM&A Report presents the monitoring works at M+ Museum and Lyric Theatre Complex (L1 and L2 Contract) from 1 January to 31 January 2021.

## **Exceedance of Action and Limit Levels**

One Action Level exceedance (due to noise related environmental complaint) with no Limit Level exceedance of construction noise, was recorded in the reporting month. There was no breach of Action or Limit levels for Air Quality (1-hour TSP and 24-hour TSP) and in this reporting month.

## **Implementation of Mitigation Measures**

Construction phase weekly site inspections were carried out on 4, 14, 18 and 25 January 2021 for M+ Museum and 6, 15, 20 and 25 January 2021 for Lyric Theatre Complex (L1 and L2 Contract) to confirm the implementation measures undertaken by the Contractors in the reporting month. The outcomes are presented in Section 4 and the status of implementation of mitigation measures in the site is shown in **Appendix J**.

Landscape and visual impact inspections were conducted as part of the abovementioned weekly site inspections during the reporting month. No adverse comment on landscape and visual aspects was made during these inspections.

## **Record of Complaints**

One environmental complaint was recorded in the reporting month.

## **Record of Notifications of Summons and Successful Prosecutions**

No notifications of summons and successful prosecutions were recorded in the reporting month.

## **Future Key Issues**

### ● M+

The major site works for M+ Museum scheduled to be commissioned in the coming month include:

- 2/F and B2 fit out
  - 2/F MEP modification works for PPEL
  - Tower UF Solar Panels installation
  - Overall area MEP flushing out/ rectifications
  - 3F landscaping works rectification
- CSF
  - Defect rectifications
- WKCDA Tower
  - MEP Post-OP installation
  - GF paving
  - Post-OP weather-tight works (indoor)

The major site works for L1 scheduled to be commissioned in the coming month include:

- Excavation and Lateral Support works
- Extended basement structure construction
- Box culvert outfall to Victoria Harbour (PIW & Cofferdam B works)
- Austin Road West Lay-by (PIW Works)
- Cofferdam at the M+ Museum to LTC interface on the waterfront

The major site works for L2 scheduled to be commissioned in the coming month include:

- LTC construction
  - Structure
    - Falsework and Formwork Erection
    - Reinforcement work
    - Concrete work
  - ABWF & MEP Work
- DSC Cofferdam (Cofferdam A)
  - Remedial work to Existing Puddle Flange in pump cell
  - Construction of valve chamber
  - Lay Pipe bedding
  - Install DCS pipes/valve/fitting
  - Construct RC thrust blocks
- Modification to Existing Pump Cell
  - ABWF works
- Extended Basement
  - ABWF & MEP Work
- Vibration Isolation Spring System Installation
  - Install Spring

Potential environmental impacts due to the construction activities, including air, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.

# 1 Introduction

## 1.1 Background

Mott MacDonald Hong Kong Limited (MMHK) was commissioned to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for the construction of M+ Museum Main Works (Contract No.: CC/2015/3A/022) and Lyric Theatre Complex including the Foundation Works (Contract No.: CC/2015/3A/014), L1 Contract (Contract No. CC/2017/3A/030) and L2 Contract (Contract No. CC/2017/3A/031) at West Kowloon Cultural District (WKCD) (The Project) as part of the WKCD development. The Project Proponent is the West Kowloon Cultural District Authority (WKCDA). The construction works and EM&A programme for M+ Museum and Lyric Theatre Complex commenced on 31 October 2015 and 1 March 2016 respectively.

The overall works for the WKCD fall under two separate categories of Designated Project (DP) of the Environmental Impact Assessment Ordinance (EIAO), namely an “engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100 000” (Item 1 of Schedule 3) and “an underpass more than 100m in length under the built areas” (Item A.9, Part I, Schedule 2). An Environmental Permit No. EP-453/2013/B (EP) was issued with respect to the “Underpass Road and Austin Road Flyover Serving the West Kowloon Cultural District” which specifically includes the abovementioned category of DP under Item A.9, Part I, Schedule 2 of the EIAO. The captioned projects include part of the abovementioned underpass road located within the site boundary also falls under this same category.

The M+ Museum development aims to provide an iconic presence for the M+ Museum, semi-transparent vertical plane, housing education facilities, a public restaurant and museum offices. At ground and lower levels, generous access will be provided to the park and other West Kowloon Cultural District facilities, alongside a public resource centre, theatres, retail and dining, and back-of-house functions.

The 1,200-seat Lyric Theatre Complex will be Hong Kong's first world-class facility for dance performances, including ballet, contemporary and Chinese dance forms. In the run up to the opening of further major performing arts venues in the WKCD, it will also be used for a wide variety of performing arts events including drama, opera and musical performances. The Lyric Theatre Complex will act as a platform for Hong Kong's leading arts organisations and be a new major venue to show programmes from Asia and worldwide.

The Monthly EM&A Report is prepared in accordance with the Condition 3.4 of the Environmental Permit No. EP-453/2013/B. This Monthly EM&A Report presents the monitoring works at M+ Museum and Lyric Theatre Complex (L1 and L2 Contract) from 1 January to 31 January 2021. The purpose of this report is to summarise the findings in the EM&A of the project over the reporting period.

## 1.2 Project Organisation

The organisation chart and lines of communication with respect to the on-site environmental management structure together with the contact information of the key personnel are shown in **Appendix A**.



### 1.3 Status of Construction Works in the Reporting Period

During the reporting period, construction works at M+ Museum undertaken include:

- M+
  - Defects Works (Timber finishes/ furniture installation, make good, landscaping works at G/F & 3/F (planting), cleaning works, hand-over)
- CSF
  - Defects Works (make good, furniture installation, cleaning works, hand-over)
- RDE
  - MEP installation works
  - T&C, ABWF works & make good
  - G/F paving works
  - FSD & BD inspection

During the reporting period, construction works at L1 undertaken include:

- Excavation and Lateral Support works
- Extended basement structure construction
- Box culvert outfall to Victoria Harbour (PIW & Cofferdam B works)
- Austin Road West Lay-by (PIW Works)
- Cofferdam at the M+ Museum to LTC interface on the waterfront

During the reporting period, construction works at L2 undertaken include:

- LTC construction
  - Structure
    - Falsework and Formwork Erection
    - Reinforcement work
    - Concrete work
  - BS Installation
- DSC Cofferdam (Cofferdam A)
  - Remedial work to Existing Puddle Flange in pump cell
  - Construction of valve chamber
  - Lay Pipe bedding
  - Install DCS pipes/valve/fitting
- Modification to Existing Pump Cell
  - ABWF works
- Vibration Isolation Spring System Installation
  - Install Spring

The Construction Works Programme of M+ Museum and Lyric Theatre Complex (L1 and L2 Contract) is provided in **Appendix B**. A layout plan of the Project is provided in **Figure 1**. Please refer to **Table 4.4**, **Table 4.5** and **Table 4.6** on the status of the environmental licenses.

## 1.4 Summary of EM&A Requirements and Alternative Monitoring Locations

The EM&A programme requires environmental monitoring of air quality, noise, landscape and visual as specified in the approved EM&A Manual.

### 1.4.1 Summary of EM&A Requirements

A summary of impact EM&A requirements is presented in **Table 1.1**.

**Table 1.1: Summary of Impact EM&A Requirements**

| Parameters         | Descriptions   | Locations  | Frequencies                   |
|--------------------|--|--|-------------------------------|
| Air Quality        | 24-Hour TSP  | AM1 - International Commerce Centre                  | At least once every 6 days    |
|                    | 1-Hour TSP   | AM1 - International Commerce Centre                  | At least 3 times every 6 days |
|                    | 24-Hour TSP  | AM2 - The Harbourside Tower 1                        | At least once every 6 days    |
|                    | 1-Hour TSP   | AM2 - The Harbourside Tower 1                        | At least 3 times every 6 days |
| Noise              | Leq, 30 minutes  | NM1- The Harbourside Tower 1                         | Weekly                        |
| Landscape & Visual | Monitor implementation of proposed mitigation measures during the construction stage | As described in Table 9.1 and 9.2 of the EM&A Manual | Bi-weekly                     |

### 1.4.2 Alternative Monitoring Locations

In the context of the monitoring activities at M+ Museum and the Lyric Complex, three monitoring stations had been considered, including AM1 (International Commerce Centre), AM2 (The Harbourside Tower 1) for air monitoring, and NM1 (The Harbourside Tower 1) for noise monitoring. Other monitoring locations (i.e. AM3 to AM5 and NM2 to NM5) were so far away from M+ Museum and the Lyric Complex and could not be representative for impact monitoring.

The Harbourside management office formally rejected our proposal of setting up air quality and noise monitoring equipment on its premises at the podium level of Tower 1 (AM2/NM1) on 10 November 2015. Nevertheless, suitable air quality monitoring location at AM2 was identified on the ground floor in front of The Harbourside Tower 1, which is at the same location as that of baseline monitoring for consistency. No management approval is required at the ground floor for conducting the air monitoring. However, the electricity supply at AM2 was suspended from 31 August 2016 and was no longer available. In order to have a more secure electricity supply, an alternative air monitoring location (AM2A) was identified at Austin Road West opposite to The Harbourside Tower 1, which is close to Lyric Theatre Complex site entrance. This alternative air monitoring location was approved by EPD on 28 September 2016. Due to works programme, the air monitoring location AM2A has been relocated to the alternative monitoring location AM2B at the 1st floor of Gammon's site office, which was approved by EPD on 21 February 2019.

Alternative noise monitoring location was identified at The Arch (NM2); however, The Arch management office formally rejected our proposal of setting up noise monitoring equipment on its premises on 23 November 2015. On the other hand, noise monitoring at G/F of Harbourside could not be representative. However, approval from the management office of the International Commerce Centre has been granted on 29 February 2016 for conducting noise monitoring at the

alternative noise monitoring location identified at the podium floor (NM1A) which is free from screening to the construction activities.

In short, 2 air quality monitoring stations and 1 noise impact monitoring station were confirmed for the impact monitoring.

The Environmental Quality Performance Limits for air quality and noise are shown in **Appendix C**.

The Event and Action Plan for air quality, construction noise, and landscape and visual are shown in **Appendix D**.

The EM&A programme followed the recommended mitigation measures in the EM&A Manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in **Appendix J**.

## 2 Impact Monitoring Methodology

### 2.1 Introduction

For air quality and noise, the monitoring methodology, including the monitoring locations, monitoring equipment used, monitoring parameters, and frequency and duration etc., for air quality and noise are detailed in this Section. The environmental monitoring schedules for the reporting period and the tentative monitoring Schedule for the coming month are provided in **Appendix E**.

For landscape and audit impact, the relevant EM&A monitoring requirements and details are also presented in this Section.

### 2.2 Air Quality

#### 2.2.1 Monitoring Parameters, Frequency and Duration

**Table 2.1** summarizes the monitoring parameters, frequency and duration of the TSP monitoring.

**Table 2.1: Air Quality Monitoring Parameters, Frequency and Duration**

| Parameter   | Frequency                       | Duration   |
|-------------|---------------------------------|------------|
| 24-hour TSP | At least once in every six-days | 24 hours   |
| 1-hour TSP  | At least 3 times every six-days | 60 minutes |

#### 2.2.2 Monitoring Locations

Currently, the works under the captioned project are confined in the western part of the WKCD site. Therefore, only the monitoring stations AM1 and AM2B were set up at the proposed locations in accordance with updated EM&A Manual. Location of the monitoring station is given in **Table 2.2** and shown in **Figure 1**.

**Table 2.2: Air Quality Monitoring Station**

| Monitoring Station | Location                            |
|--------------------|-------------------------------------|
| AM1                | International Commerce Centre (ICC) |
| AM2B               | 1st Floor of Gammon's Site Office   |

#### 2.2.3 Monitoring Equipment

Continuous 24-hour TSP air quality monitoring was conducted using High Volume Sampler (HVS) (Model: TE-5170) located at the designated monitoring station. The HVS meets all the requirements stated in of the EM&A Manual. Portable direct reading dust meter was used to carry out the 1-hour TSP monitoring. **Table 2.3** summarizes the equipment used in the impact air quality monitoring. Copies of the calibration certificates for the HVS, calibration kit and portable dust meters are attached in **Appendix F**.

**Table 2.3: TSP Monitoring Equipment**

| Equipment                          | Model  |
|------------------------------------|--|
| <b>24-hour TSP monitoring</b>      |  |
| High Volume Sampler                | TE-5170 (Serial No.: 0767 and 8919)          |
| Calibrator                         | TE-5025A (Orifice I.D.: 2454)                |
| <b>1-hour TSP monitoring</b>       |  |
| Portable direct reading dust meter | Sibata LD-3B (Serial No.: 245833 and 276015) |

Calibration of the HVS (five point calibration) using Calibration Kit was carried out every two months. The HVS calibration orifice will be calibrated annually. Calibration certificate of the TE-5025A Calibration Kit and the HVS are provided in **Appendix F**.

The 1-hour TSP monitoring should be determined periodically (e.g. annually) by the HVS to check the validity and accuracy of the results measured by direct reading method.

#### 2.2.4 Monitoring Methodology

##### **24-hour TSP Monitoring**

##### **Installation**

The HVS was installed at the site boundary. The following criteria were considered in the installation of the HVS.

- A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
- The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
- A minimum of 2 metres separation from walls, parapets and penthouse was required for rooftop sampler.
- A minimum of 2 metres separation from any supporting structure, measured horizontally was required.
- No furnace or incinerator flues or building vent were nearby.
- Airflow around the sampler was unrestricted.
- The sampler has been more than 20 metres from any drip line.
- Permission was obtained to set up the sampler and to obtain access to the monitoring station.
- A secured supply of electricity is needed to operate the sampler.

##### **Preparation of Filter Papers**

- Glass fibre filters were labelled and sufficient filters that were clean and without pinholes were selected.
- The filters used are specified to have a minimum collection efficiency of 99 percent for 0.3 µm (DOP) particles.
- All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C with relative humidity (RH) < 50% and was not variable by more than ±5 %. A convenient working RH was 40%. All preparation of filters was done by Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory.

## Field Monitoring Procedures

- The power supply was checked to ensure the HVS works properly.
- The filter holder and the area surrounding the filter were cleaned.
- The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
- The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
- The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges.
- The shelter lid was closed and was secured with the aluminium strip.
- The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
- A new flow rate record sheet was set into the flow recorder.
- The flow rate of the HVS was checked and adjusted at around 1.3 m<sup>3</sup>/min. The range specified in the EM&A Manual was between 0.6-1.7 m<sup>3</sup>/min.
- The programmable timer was set for a sampling period of 24 hours, and the starting time, weather condition and the filter number were recorded.
- The initial elapsed time was recorded.
- At the end of sampling, the sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
- It was then placed in a clean plastic envelope and sealed.
- All monitoring information was recorded on a standard data sheet.
- Filters were sent to a Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory for analysis.

## Maintenance and Calibration

- The HVS and its accessories are maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
- HVSs were calibrated upon installation and thereafter at bi-monthly intervals. The calibration kits were calibrated annually.
- Calibration records for HVS and calibration kit are shown in **Appendix F**.

## 1-hour TSP Monitoring

### Field Monitoring

The measuring procedures of the 1-hour dust meter are in accordance with the Manufacturer's Instruction Manual as follows:

- Turn the power on.
- Close the air collecting opening cover.
- Push the "TIME SETTING" switch to [BG].
- Push "START/STOP" switch to perform background measurement for 6 seconds.
- Turn the knob at SENSI ADJ position to insert the light scattering plate.
- Leave the equipment for 1 minute upon "SPAN CHECK" is indicated in the display.
- Push "START/STOP" switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.
- Pull out the knob and return it to MEASURE position.
- Setting time period of 1 hour for the 1-hour TSP measurement.
- Push "START/STOP" to start the 1-hour TSP measurement.

- Regular checking of the time period setting to ensure monitoring time of 1 hour.

### Maintenance and Calibration

- The 1-hour dust meter would be checked at 3-month intervals and calibrated at 1-year intervals throughout all stages of the air quality monitoring.
- Calibration records for direct dust meters are shown in **Appendix F**.

### Weather Condition

- Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix H**.

## 2.3 Noise

### 2.3.1 Monitoring Parameters, Frequency and Duration

**Table 2.4** summarizes the monitoring parameters, frequency and duration of noise monitoring. The noise in A-weighted levels  $L_{eq}$ ,  $L_{10}$  and  $L_{90}$  are recorded in a 30-minute interval between 0700 and 1900 hours.

**Table 2.4: Noise Monitoring Parameters, Period and Frequency**

| Time Period                                     | Parameters   | Frequency       |
|---|--|-----------------|
| Daytime on normal weekdays<br>(0700-1900 hours) | $L_{eq}$ (30 min), $L_{90}$ (30 min) & $L_{10}$ (30 min) | Once every week |

### 2.3.2 Monitoring Location

Currently, the works under the captioned project are confined in the western part of the WKCD site. Therefore, only the monitoring station NM1A was set up at the proposed location in accordance with updated EM&A Manual. Location of the monitoring station is given in **Table 2.5** and shown in **Figure 1**.

**Table 2.5: Noise Monitoring Station**

| Monitoring Station | Location                            |
|--------------------|-------------------------------------|
| NM1A               | International Commerce Centre (ICC) |

### 2.3.3 Monitoring Equipment

Integrating Sound Level Meter was used for noise monitoring. It was a Type 1 sound level meter capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level ( $L_{Aeq}$ ) and percentile sound pressure level ( $L_x$ ). They comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). **Table 2.6** summarizes the noise monitoring equipment model being used.

**Table 2.6: Noise Monitoring Equipment**

| Monitoring Station | Equipment Model                  |  |
|--------------------|----------------------------------|--|
|                    | Integrating Sound Level Meter    | Calibrator                             |
| NM1A               | Rion NL-52 (Serial No. 01010406) | LARSON DAVIS CAL200 (Serial No. 11333) |

### 2.3.4 Monitoring Methodology

#### Field Monitoring

- The microphone of the Sound Level Meter was set at least 1.2 m above the ground.
- Free Field measurement was made at the monitoring locations.
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
  - frequency weighting: A
  - time weighting: Fast
  - time measurement: 30 minutes intervals (between 0700-1900 on normal weekdays)
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1 kHz. If the difference in the calibration level before and after measurement was more than 1 dB, the measurement would be considered invalid and has to be repeated after re-calibration or repair of the equipment.
- During the monitoring period, the  $L_{eq}$ ,  $L_{10}$  and  $L_{90}$  were recorded. In addition, any site observations and noise sources were recorded on a standard record sheet.
- A correction of +3dB(A) was made to the free field measurements.

#### Maintenance and Calibration

- The microphone head of the sound level meter and calibrator is cleaned with soft cloth at quarterly intervals.
- The sound level meter and calibrator are sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.
- Calibration records are shown in **Appendix F**.

#### Weather Condition

- Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix H**.

## 2.4 Landscape and Visual

### 2.4.1 Monitoring Program

**Table 2.7** details the monitoring program (as proposed in the WKCD EIA report) for landscape and visual impact during the construction phase.

**Table 2.7: Monitoring Program for Landscape and Visual Impact during Construction Phase**

| Stage        | Monitoring Task   | Frequency | Report                                  | Approval              |
|--------------|---|-----------|---|-----------------------|
| Construction | Monitor implementation of proposed mitigation measures during the construction stage. | Bi-weekly | ET to report on Contractor's compliance | Counter-signed by IEC |

During the landscape and visual impact monitoring, any changes in relation to the landscape and visual amenity should be monitored with reference to the baseline conditions of the site. In addition, mitigation measures were proposed in the WKCD EIA report to minimise the landscape and visual impacts during the construction phase. The proposed mitigation measures as shown in Table 9.1 and Table 9.2 of the EM&A Manual should be checked for proper implementation.



## 3 Monitoring Results

### 3.1 Impact Monitoring

Construction impact monitoring for air quality, noise and landscape and visual impact was undertaken in compliance with the EM&A Manual during the reporting month.

### 3.2 Air Quality Monitoring

#### 3.2.1 1-hour TSP

Results of 1-hour TSP at the monitoring location AM1 and AM2B are summarised in **Table 3.1**. Graphical plots of the monitoring results are shown in **Appendix G**.

**Table 3.1: Summary of 1-hour TSP monitoring results**

| Monitoring Station | Monitoring Date | Start Time | 1-hour TSP ( $\mu\text{g}/\text{m}^3$ ) |            |            | Range ( $\mu\text{g}/\text{m}^3$ ) | Action Level ( $\mu\text{g}/\text{m}^3$ ) | Limit Level ( $\mu\text{g}/\text{m}^3$ ) |
|--------------------|-----------------|------------|---|------------|------------|------------------------------------|---|--|
|                    |                 |            | 1st Result                              | 2nd Result | 3rd Result |                                    |   |  |
| AM1                | 05-Jan-21       | 8:22       | 68                                      | 75         | 82         | 50-88                              | 273.7                                     | 500                                      |
|                    | 11-Jan-21       | 8:22       | 69                                      | 77         | 85         |                                    |   |  |
|                    | 16-Jan-21       | 8:32       | 62                                      | 58         | 50         |                                    |   |  |
|                    | 22-Jan-21       | 8:27       | 71                                      | 78         | 85         |                                    |   |  |
|                    | 28-Jan-21       | 8:33       | 72                                      | 80         | 88         |                                    |   |  |
| AM2B               | 05-Jan-21       | 8:38       | 70                                      | 77         | 84         | 70-90                              | 274.2                                     | 500                                      |
|                    | 11-Jan-21       | 8:36       | 71                                      | 78         | 86         |                                    |   |  |
|                    | 16-Jan-21       | 8:48       | 79                                      | 86         | 80         |                                    |   |  |
|                    | 22-Jan-21       | 8:43       | 73                                      | 80         | 88         |                                    |   |  |
|                    | 28-Jan-21       | 8:47       | 74                                      | 82         | 90         |                                    |   |  |

#### 3.2.2 24-hour TSP

Results of 24-hour TSP at the monitoring location AM1 and AM2B are summarised in **Table 3.2**. Graphical plots of the monitoring results are shown in **Appendix G**.

**Table 3.2: Summary of 24-hour TSP monitoring results**

| Monitoring Station | Monitoring Date | Start Time | Monitoring Results ( $\mu\text{g}/\text{m}^3$ ) | Range ( $\mu\text{g}/\text{m}^3$ ) | Action Level ( $\mu\text{g}/\text{m}^3$ ) | Limit Level ( $\mu\text{g}/\text{m}^3$ ) |
|--------------------|-----------------|------------|---|------------------------------------|---|--|
| AM1                | 05-Jan-21       | 08:20      | 29  | 29-62                              | 143.6                                     | 260                                      |
|                    | 11-Jan-21       | 10:20      | 62  |                                    |   |  |
|                    | 16-Jan-21       | 08:30      | 40  |                                    |   |  |
|                    | 22-Jan-21       | 08:25      | 48  |                                    |   |  |
|                    | 28-Jan-21       | 08:30      | 60  |                                    |   |  |
| AM2B               | 05-Jan-21       | 08:36      | 60  | 60-143                             | 151.1                                     | 260                                      |
|                    | 11-Jan-21       | 08:34      | 86  |                                    |   |  |
|                    | 16-Jan-21       | 08:46      | 64  |                                    |   |  |
|                    | 22-Jan-21       | 08:40      | 87  |                                    |   |  |

|           |       |     |
|-----------|-------|-----|
| 28-Jan-21 | 08:45 | 143 |
|-----------|-------|-----|

No exceedance of 1-hour and 24-hour TSP (Action or Limit Level) was recorded in the reporting period.

### 3.3 Noise Monitoring

The construction noise monitoring results at the monitoring location NM1A are summarized in **Table 3.3**. Graphical plots of the monitoring data and the station set-up of a free-field measurement are shown in **Appendix G**.

**Table 3.3: Summary of noise monitoring results during normal weekdays**

| Monitoring Date | Start Time | End Time | L <sub>eq</sub> (30 mins)*, dB(A) | Limit Level for L <sub>eq</sub> (dB(A)) |
|-----------------|------------|----------|-----------------------------------|---|
| 05-Jan-21       | 09:24      | 09:54    | 68                                | 75                                      |
| 11-Jan-21       | 09:05      | 09:35    | 68                                |   |
| 22-Jan-21       | 09:30      | 10:00    | 68                                |   |
| 28-Jan-21       | 09:36      | 10:06    | 68                                |   |

Remarks:

\* +3dB (A) correction was applied to free-field measurement.

One Action Level exceedance (due to noise related environmental complaint) with no Limit Level exceedance of construction noise, was recorded in the reporting month.

### 3.4 Landscape and Visual Impact

Landscape and visual impact inspections were conducted as part of the weekly site inspections on 4 and 18 January 2021 for M+ Museum, and 15 and 25 January 2021 for Lyric Theatre Complex (L1 and L2 Contract) during the reporting month. As reviewed by the registered Landscape Architect, no adverse comment on landscape and visual aspects was made during these inspections.

The landscape and visual mitigation measures were implemented during the reporting period. The summary of implementation status of the environmental mitigation measures is provided in **Appendix J**.

## 4 Site Environmental Management

### 4.1 Site Inspection

#### 4.1.1 M+ Museum

Construction phase weekly site inspections were carried out on 4, 14, 18 and 25 January 2021. The joint site inspection with IEC, ET, ER and Contractor was held on 25 January 2021. All observations have been recorded in the site inspection checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary.

The key observations from the site inspections and associated recommendations are summarized in **Table 4.1**.

**Table 4.1: Summary of Site Inspections and Recommendations for M+ Museum**

| Inspection Date | Parameter     | Observation / Recommendation   | Contractor's Responses / Action(s) Undertaken       | Close-out (Date) |
|-----------------|---------------|--|---|------------------|
| 04-Jan-21       | Air Quality   | The contractor was reminded to maintain in high standard of housekeeping to prevent emission of fugitive dust. | The stockpile has been treated and flattened.       | 07-Jan-21        |
| 18-Jan-21       | Water Quality | The contractor was reminded to provide mitigation measures to prevent the discharge of wastewater.             | The contractor has cleaned up the surrounding area. | 25-Jan-21        |

#### 4.1.2 Lyric Theatre Complex

Construction phase weekly site inspections were carried out on 6, 15, 20 and 25 January 2021 (L1 and L2 Contract). The joint site inspection with IEC, ET, ER and Contractor was held on 20 January 2021. All observations have been recorded in the site inspection checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary.

The key observations from the site inspections and associated recommendations are summarized in **Table 4.2 and Table 4.3**.

**Table 4.2: Summary of Site Inspections and Recommendations for L1**

| Inspection Date | Parameter     | Observation / Recommendation   | Contractor's Responses / Action(s) Undertaken  | Close-out (Date) |
|-----------------|---------------|--|--|------------------|
| 30-Dec-20       | Water Quality | Chemicals were observed on ground without drip tray, the contractor was reminded to provide a drip tray.   | The contractor has ensured that the wastewater treatment facilities could function properly. | 12-Jan-21        |
| 06-Jan-21       | Water Quality | Oil leakage was observed on the ground. The contractor was reminded to clear the oil stain.                | The contractor has cleaned up the oil stain.   | 07-Jan-21        |
| 06-Jan-21       | Water Quality | The contractor was reminded to ensure the wastewater treatment facilities could function properly.         | The contractor has ensured that the wastewater treatment facilities could function properly. | 12-Jan-21        |
| 25-Jan-21       | Water Quality | The contractor was reminded to remove the algae in the wastewater treatment facility before its operation. | The contractor has cleared the algae.  | 26-Jan-21        |

**Table 4.3: Summary of Site Inspections and Recommendations for L2**

| Inspection Date | Parameter     | Observation / Recommendation  | Contractor's Responses / Action(s) Undertaken | Close-out (Date) |
|-----------------|---------------|---|---|------------------|
| 20-Jan-21       | Air Quality   | Stockpiles were observed at the steel deck.   | The contractor has removed the stockpiles.    | 24-Jan-21        |
| 25-Jan-21       | Air Quality   | Stockpiles were observed, the contractor was reminded to clean them up regularly.       | The contractor has cleaned up the stockpiles. | 29-Jan-21        |
| 25-Jan-21       | Water Quality | The contractor was reminded to reinforce concrete bunding to prevent effluent overflow. | -   | Ongoing          |

## 4.2 Advice on the Solid and Liquid Waste Management Status

The Contractors have been registered as a chemical waste producer for the Project. Construction and demolition (C&D) material sorting will be carried out on site. A sufficient number of receptacles were available for general refuse collection.

### 4.2.1 M+ Museum

As advised by the Contractor, no inert C&D material was disposed of as public fill to Chai Wan Public Fill Barging Point, Tuen Mun Area 38, Tseung Kwan O Area 137 Public Fill and Tseung Kwan O Area 137 Sorting Facility respectively in the reporting month. 218.0 tonnes of general refuse were disposed of at SENT landfill. 0.0 tonne of metals, 0.0 tonne of paper/cardboard packaging, 0.0 tonne of plastic and 0.0 tonne of timber was collected by recycling contractors in the reporting month. 0.0 tonne of inert C&D material was reused on site. 0.0 tonne of inert C&D material was reused in other projects. 0.0 tonne of chemical waste was collected by licensed contractors in the reporting period.

The cumulative waste generation records for M+ Museum are shown in **Appendix I**.

#### 4.2.2 Lyric Theatre Complex

As advised by the Contractors (L1 and L2 Contract), 705.84 tonnes and 175.55 tonnes of inert C&D materials were disposed of as public fill to Tseung Kwan O Area 137 Public Fill and Tuen Mun Area 38 Public Fill respectively in the reporting month, while 497.0 tonnes of general refuse were disposed of at SENT and WENT landfill. 835.1 tonnes of metals, 0.0 tonne of paper/cardboard packaging, 0.0 tonne of plastics and 0.0 tonne of timber were collected by recycling contractors in the reporting month. 0.0 tonne of inert C&D material was reused on site. 0.0 tonne of inert C&D materials was reused in other projects and 0.0 tonne of inert C&D material was imported for reuse at site. 0.0 tonne of inert C&D material was disposed to sorting facility and 0.0 tonne of chemical waste was collected by licensed contractors in the reporting period.

The actual amounts of different types of waste generated by the activities of construction works at Lyric Theatre Complex in the reporting month are shown in **Appendix I**.

#### 4.3 Status of Environmental Licenses and Permits

The environmental permits, licenses, and/or notifications on environmental protection for this Project which were valid during the period are summarised in **Table 4.4** and **Table 4.5** and **Table 4.6**.

##### 4.3.1 M+ Museum

**Table 4.4: Status of Environmental Submissions, Licenses and Permits for M+ Museum**

| Permit / License No.<br>/ Notification /<br>Reference No.               | Valid Period |           | Status         | Remarks  |
|---|--------------|-----------|----------------|--|
|   | From         | To        |                |  |
| Chemical Waste Producer Registration                                    |              |           |                |  |
| WPN5213-217-G2347-53  | 04-Oct-18    | --        | Valid          | --   |
| Billing Account Construction Waste Disposal                             |              |           |                |  |
| 7031993   | 03-Oct-18    | --        | Account Active | --   |
| Construction Noise Permit   |              |           |                |  |
| GW-RE0762-20  | 14-Sep-20    | 6-Mar-21  | Valid          | --   |
| Wastewater Discharge License  |              |           |                |  |
| WT-00033363-2019  | 21-Mar-19    | 31-Mar-24 | Cancelled      | Contractor notified EPD on 28 Dec 2020 that the license will be terminated after 31 Dec 2020 |
| Notification under Air Pollution Control (Construction Dust) Regulation |              |           |                |  |
| 437339  | 12-Sep-18    | --        | Notified       | --   |

### 4.3.2 Lyric Theatre Complex

**Table 4.5: Status of Environmental Submissions, Licenses and Permits for L1**

| Permit / License No.<br>/ Notification / Reference No.                  | Valid Period |           | Status         | Remarks |
|---|--------------|-----------|----------------|---------|
|   | From         | To        |                |         |
| Chemical Waste Producer Registration                                    |              |           |                |         |
| WPN5213-217-G2347-39  | 17-Feb-16    | --        | Valid          | --      |
| Billing Account Construction Waste Disposal                             |              |           |                |         |
| 7029925   | 22-Jan-18    | --        | Account Active | --      |
| Construction Noise Permit   |              |           |                |         |
| GW-RE1056-20  | 7-Dec-20     | 27-May-21 | Valid          | --      |
| Wastewater Discharge License  |              |           |                |         |
| WT-00030694-2018  | 11-Apr-18    | 30-Apr-23 | Valid          | --      |
| Notification under Air Pollution Control (Construction Dust) Regulation |              |           |                |         |
| 429708  | 16-Jan-18    | --        | Notified       | --      |

**Table 4.6: Status of Environmental Submissions, Licenses and Permits for L2**

| Permit / License No.<br>/ Notification / Reference No.                  | Valid Period |           | Status         | Remarks                               |
|---|--------------|-----------|----------------|---------------------------------------|
|   | From         | To        |                |                                       |
| Chemical Waste Producer Registration                                    |              |           |                |                                       |
| WPN5213-217-G2347-39  | 17-Feb-16    | --        | Valid          | This license/ permit is share with L1 |
| Billing Account Construction Waste Disposal                             |              |           |                |                                       |
| 7032787   | 02-Jan-19    | --        | Account Active | --                                    |
| Construction Noise Permit   |              |           |                |                                       |
| GW-RE1056-20  | 7-Dec-20     | 27-May-21 | Valid          | This license/ permit is share with L1 |
| Wastewater Discharge License  |              |           |                |                                       |
| WT-00030694-2018  | 11-Apr-18    | 30-Apr-23 | Valid          | This license/ permit is share with L1 |
| Notification under Air Pollution Control (Construction Dust) Regulation |              |           |                |                                       |
| 448474  | 27-Aug-19    | --        | Notified       | --                                    |

## 4.4 Recommended Mitigation Measures

The EM&A programme followed the recommended mitigation measures in the EM&A Manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in **Appendix J**. In particular, the following mitigation measures were brought to attention during the site inspections:

### 4.4.1 M+ Museum

#### Air Quality

- Maintain in high standard of housekeeping to prevent emission of fugitive dust.

#### Water Quality

- Sand/ silt traps and sandbags should be provided to prevent sand/ silt particles from runoff.

#### 4.4.2 Lyric Theatre Complex

##### L1

##### **Water Quality**

- Chemicals should be stored in designated areas which have pollution prevention facilities.
- Drainage facilities should always ensure efficient operation.

##### L2

##### **Air Quality**

- Stockpiles should regularly be cleaned up.

##### **Water Quality**

- Earth bunds or barriers should be provided on site to prevent effluent overflow.

## 5 Compliance with Environmental Permit

The status of the required submission under the EP during the reporting period is summarized in **Table 5.1**.

**Table 5.1: Status of Submissions under the Environmental Permit**

| EP Condition  | Submission                            | Submission Date |
|---------------|---------------------------------------|-----------------|
| Condition 3.4 | Monthly EM&A Report for December 2020 | 14 January 2021 |



## 6 Report in Non-compliance, Complaints, Notification of Summons and Successful Prosecutions

### 6.1 Record on Non-compliance of Action and Limit Levels

One Action Level exceedance (due to noise related environmental complaint) with no Limit Level exceedance of construction noise was recorded in the reporting month. There was no breach of Action or Limit Levels for Air Quality monitoring in the reporting month.

### 6.2 Record on Environmental Complaints Received

One environmental complaint was received in the reporting month.

WKCD received a complaint from the office of Mr Derek Hung (Yau Tsim Mong District Council Member) on 27 Jan 2021. He mentioned that he received a complaint from the resident of The Harbourside regarding noise nuisance which started at around 7a.m on 27 Jan 2021 (with a video record included) from the construction sites of WKCD. The resident understood that the working hours permitted by the government is 7a.m. to 7p.m., except public holiday. However, the resident would like to seek to reduce the noise nuisance by undertaken the noisy works after 9a.m.

The investigation revealed that the construction noise could be attributable to the Lyric Theatre Complex (L2 Contract) which involved the use of breaker at around 7:10 a.m. on 27 January 2021. Subsequently, specific mitigation measures have been devised and implemented on top of the pre-existing regular noise mitigation measures.

Although the complaint may not be attributable to other Contracts (i.e. M+ Museum and Lyric Theatre Complex (L1 Contract)), noise mitigation measures will continue to be strictly implemented on site. Nevertheless, the contractors are reminded to strengthen the implementation of the recommendations for noise mitigation measures to reduce impacts to the nearby residents.

The cumulative statistics on complaints were provided in **Appendix K**.

### 6.3 Record on Notifications of Summons and Successful Prosecution

No notifications of summons or successful prosecutions were received this month. The cumulative statistics on notifications of summons and successful prosecutions were provided in **Appendix K**.

## 7 Future Key Issues

### 7.1 Construction Works for the Coming Month(s)

#### 7.1.1 M+ Museum

The major site works for M+ Museum scheduled to be commissioned in the coming month include:

- M+
  - 2/F and B2 fit out
  - 2/F MEP modification works for PPEL
  - Tower UF Solar Panels installation
  - Overall area MEP flushing out/ rectifications
  - 3F landscaping works rectification
- CSF
  - Defect rectifications
- WKCDA Tower
  - MEP Post-OP installation
  - GF paving
  - Post-OP weather-tight works (indoor)

#### 7.1.2 Lyric Theatre Complex

The major site works for L1 scheduled to be commissioned in the coming month include:

- Excavation and Lateral Support works
- Extended basement structure construction
- Box culvert outfall to Victoria Harbour (PIW & Cofferdam B works)
- Austin Road West Lay-by (PIW Works)
- Cofferdam at the M+ Museum to LTC interface on the waterfront

The major site works for L2 scheduled to be commissioned in the coming month include:

- LTC construction
  - Structure
    - Falsework and Formwork Erection
    - Reinforcement work
    - Concrete work
  - ABWF & MEP Work
- DSC Cofferdam (Cofferdam A)
  - Remedial work to Existing Puddle Flange in pump cell
  - Construction of valve chamber
  - Lay Pipe bedding
  - Install DCS pipes/valve/fitting

- Construct RC thrust blocks
- Modification to Existing Pump Cell
  - ABWF works
- Extended Basement
  - ABWF & MEP Work
- Vibration Isolation Spring System Installation
  - Install Spring

## 7.2 Key Issues for the Coming Month

### 7.2.1 M+ Museum

Key issues to be considered in the coming month include:

- Generation of dust from construction works;
- Noise impact from operating equipment and machinery on-site;
- Generation of site surface runoffs and wastewater from activities on-site;
- Management of stockpiles and slopes, particularly on rainy days;
- Sorting, recycling, storage and disposal of general refuse and construction waste; and
- Management of chemicals and avoidance of oil spillage on-site.

### 7.2.2 Lyric Theatre Complex

Key issues to be considered in the coming month include:

- Generation of dust from construction works;
- Noise impact from operating equipment and machinery on-site;
- Generation of site surface runoffs and wastewater from activities on-site;
- Management of stockpiles and slopes, particularly on rainy days;
- Sorting, recycling, storage and disposal of general refuse and construction waste; and
- Management of chemicals and avoidance of oil spillage on-site.

## 7.3 Monitoring Schedule for the Coming Month

The environmental site inspection and environmental monitoring will be continued in the coming month. Impact monitoring for air quality and noise in accordance with the approved EM&A Manual has commenced since 31 October 2015 and 5 March 2016 respectively. The tentative monitoring schedule for the coming month is shown in the **Appendix E**.

## 8 Conclusions and Recommendations

### 8.1 Conclusions

The EM&A programme as recommended in the EM&A Manual has been undertaken since the construction of M+ Museum main works commenced on 31 October 2015, and the construction of Lyric Theatre Complex commenced on 1 March 2016.

Monitoring of air quality and noise with respect to the Projects is underway. In particular, the 1-hour TSP, 24-hour TSP, noise level (as  $L_{eq}$ , 30 minutes) under monitoring have been checked against established Action and Limit levels. There was no breach of Action and Limit Levels for 1-hour TSP, 24-hour TSP in the reporting month.

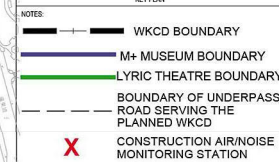
One Action Level exceedance (due to noise related environmental complaint) with no Limit Levels exceedance was recorded in the reporting month. No notifications of summons or successful prosecutions were received during the reporting month.

Weekly construction phase site inspections and bi-weekly landscape and visual impact inspections were conducted during the reporting month as required. It was observed that the Contractors had implemented all possible and feasible mitigation measures to mitigate the potential environmental impacts during construction phase works.

### 8.2 Recommendations

Potential environmental impacts due to the construction activities, including air quality, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.

## **Figure 1     Site Layout Plan and Monitoring Stations**

[illegible]

| REV. | DATE | DESCRIPTION | INITIAL |
|------|------|-------------|---------|
|------|------|-------------|---------|

|               |   |
|---------------|---|
| DRAWING TITLE | <b>SITE LAYOUT PLAN AND<br/>MONITORING STATIONS</b> |
|---------------|---|

|       |       |         |    |
|-------|-------|---------|----|
| SCALE | 1:100 | PRINTED | A1 |
|-------|-------|---------|----|

|         |      |
|---------|------|
| CHECKED | DATE |
|---------|------|

|          |      |
|----------|------|
| APPROVED | DATE |
|----------|------|

|              |  |
|--------------|--|
| CONTRACT NO. |  |
|--------------|--|

|                 |      |
|-----------------|------|
| DRAWING NO.     | REV. |
| <b>FIGURE 1</b> | XA   |

CAD REF NAME: XXXXX-AUT-PLNS DWG-P00-L000-0000-XXX.dwg

|           |  |
|-----------|--|
| AUTHORITY |  |
|-----------|--|

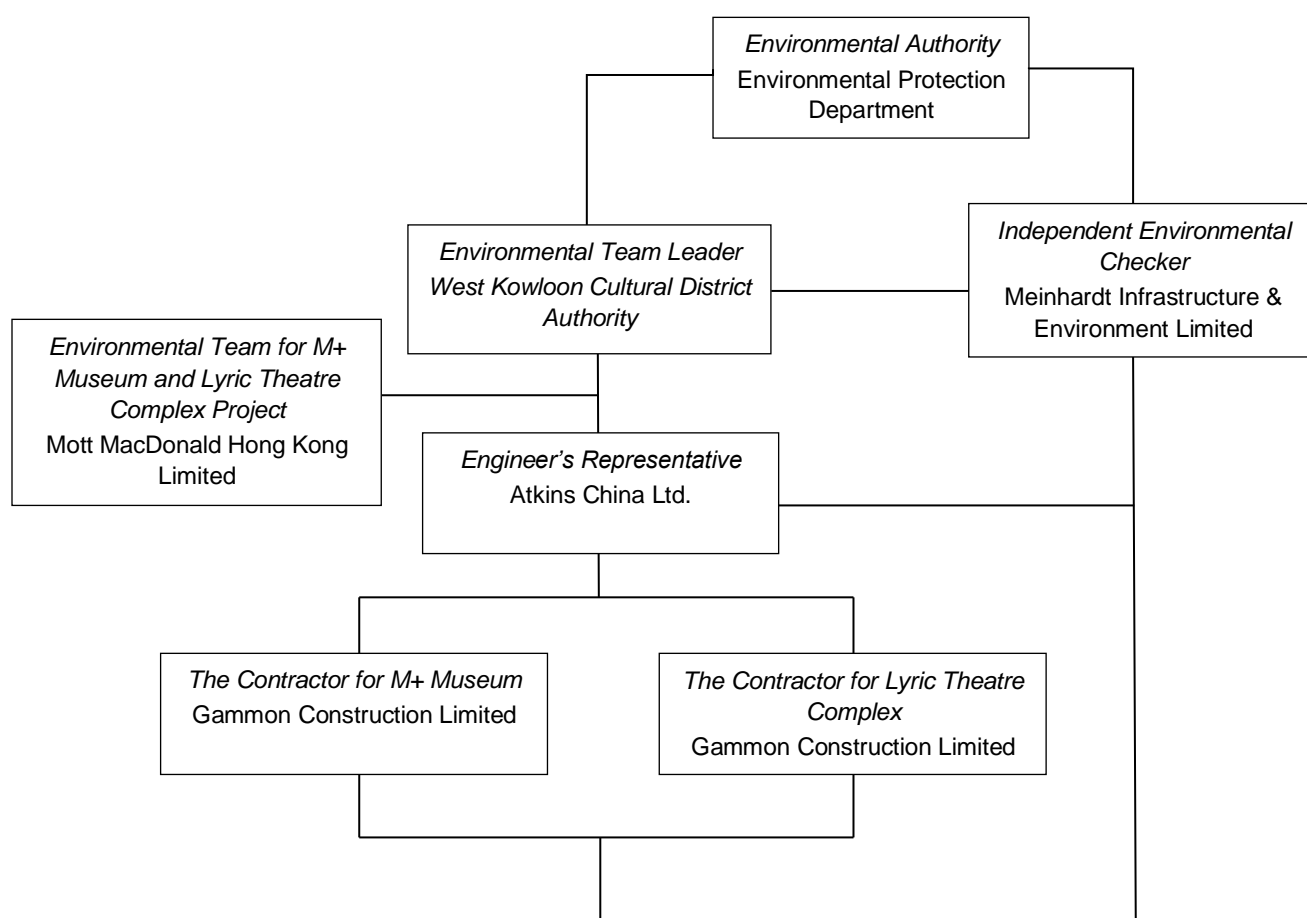
**westKowloon**  
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# Appendices

- A. Project Organisation
- B. Tentative Construction Programme
- C. Action and Limit Levels for Construction Phase
- D. Event and Action Plan for Air Quality, Noise, Landscape and Visual Impact
- E. Monitoring Schedule
- F. Calibration Certifications
- G. Graphical Plots of the Monitoring Results
- H. Meteorological Data Extracted from Hong Kong Observatory
- I. Waste Flow table
- J. Environmental Mitigation Measures – Implementation Status
- K. Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

## A. Project Organisation





**Table A-1: Contact information**

| Company Name                                   | Role  | Name             | Telephone | Email                              |
|--|---|------------------|-----------|------------------------------------|
| Atkins China Ltd.                              | Resident Engineer                                       | Ms. Gloria Lui   | 5506 6361 | gloria.lui@atkinsglobal.com        |
| Meinhardt Infrastructure & Environment Limited | Independent Environmental Checker                       | Ms. Claudine Lee | 2859 5409 | claudinelee@meinhardt.com.hk       |
| Gammon Construction Limited (M+ Museum)        | Environmental Manager                                   | Mr. Andy Leung   | 9489 0035 | andy.leung@gammonconstruction.com  |
| Gammon Construction Limited (L1)               | Environmental Manager                                   | Ms. Sammie Chan  | 9864 4296 | sammie.chan@gammonconstruction.com |
| Gammon Construction Limited (L2)               | Environmental Manager                                   | Mr. Ivan Chiu    | 9416 1664 | ivan.chiu@gammonconstruction.com   |
| Mott MacDonald Hong Kong Ltd.                  | Contractor's Environmental Team Leader                  | Mr. Thomas Chan  | 2828 5757 | thomas.chan@mottmac.com            |
| West Kowloon Cultural District Authority       | Senior Project Manager (Safety, Health and Environment) | Mr. C.K. Wu      | 5506 9178 | ck.wu@wkda.hk                      |

## **B. Tentative Construction Programme**

# **M+ Museum**



**L1**

| Activity ID  | Activity Name                      | Start Date  | Finish Date | 2021   |     |     |     |
|--|------------------------------------|-------------|-------------|--|-----|-----|-----|
|  |                                    |             |             | Jan  | Feb | Mar | Apr |
|  |                                    |             |             | 37   | 38  | 39  | 40  |
| L1 Contract for Lyric Theatre Complex (3MRP)   |                                    |             |             |  |     |     |     |
| Cost Centre C - Basement   |                                    |             |             |  |     |     |     |
| Cost Centre C1 - Essential Basement Structure (Excl. AET Protection & Box Culvert)   |                                    |             |             |  |     |     |     |
| SU10000  | South Basement - Central Area      | 30-Apr-19 A | 05-Mar-21   |  |     |     |     |
| SU11000  | South Basement - South / West Area | 14-Dec-19 A | 19-Feb-21   |  |     |     |     |
| SU12000  | South Basement - East Area         | 27-Feb-20 A | 10-Mar-21   |  |     |     |     |
| SU13000  | North Basement - North Area        | 12-Jun-19 A | 09-Apr-21   |  |     |     |     |
| SU14000  | North Basement - Area 6            | 01-Jun-19 A | 11-Feb-21   |  |     |     |     |
| Cost Centre C3 - AET Protection  |                                    |             |             |  |     |     |     |
| SU21000  | Wall Beam WE                       | 08-Jun-20 A | 09-Jan-21 A |  |     |     |     |
| SU25000  | Wall Beam WC                       | 06-May-20 A | 08-Jan-21 A |  |     |     |     |
| SU27000  | Structure between Wal Beam         | 19-Aug-20 A | 12-Jan-21 A |  |     |     |     |
| SU28000  | On-grade Slab between Wall Beam    | 25-Jan-21 A | 27-Feb-21   |  |     |     |     |
| Cost Centre C4 - Box Culvert   |                                    |             |             |  |     |     |     |
| SU30000  | South Section                      | 30-Dec-20 A | 30-Mar-21   |  |     |     |     |
| SU31000  | North Section                      | 22-Jun-20 A | 30-Mar-21   |  |     |     |     |
| SU32000  | Austin Road                        | 29-Jun-20 A | 05-Aug-21   |  |     |     |     |
| Cost Centre D - Public Infrastructure Works (PIW)  |                                    |             |             |  |     |     |     |
| SU40000  | Drainage Works                     | 20-Mar-18 A | 08-Feb-21   |  |     |     |     |
| SU41000  | Utilities & Road Works             | 04-Oct-18 A | 06-May-21   |  |     |     |     |
| SU42000  | Box Culvert Outfall                | 24-Nov-20 A | 06-Sep-21   |  |     |     |     |
| Cost Centre E - Miscellaneous Works  |                                    |             |             |  |     |     |     |
| SU50000  | Drainage & Sewerage Works          | 19-Nov-19 A | 31-May-21   |  |     |     |     |
| SU52000  | DCS Outfall                        | 24-Nov-20 A | 06-Sep-21   |  |     |     |     |
| <div><div></div> Remaining Work</div> <div><div></div> Critical Remaining Work</div> <div><div></div> Actual Work</div> <div><div></div> Milestone</div>                 |                                    |             |             | Project ID: L13MRP-20210131-ENV<br>Layout: L1-3MRP (Env)<br>Page: 1 of 1 |     |     |     |
| West Kowloon Cultural District Authority<br>L1 Contract for Lyric Theatre Complex & Extended Basement<br>Three Month Rolling Programme (3MRP) - Status as of 31 Jan 2021 |                                    |             |             | <div><div></div><div>Gammon</div></div>                                  |     |     |     |

**L2**

| ID  | Activity   | RD  | Start       | Finish      | BL VAR | LM VAR | 2020  |             |           |     |   | 2021 |       |       |       |       | 2022 |   |   |       |       | 2023  |       |   |   |   | 2024  |       |       |       |   |   |   |
|---|--|-----|-------------|-------------|--------|--------|-------|-------------|-----------|-----|---|------|-------|-------|-------|-------|------|---|---|-------|-------|-------|-------|---|---|---|-------|-------|-------|-------|---|---|---|
|   |  |     |             |             |        |        | 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 |   |   |   |
|   |  |     |             |             |        |        | A     | J           | J         | A   | S | O    | N     | D     |       | J     | F    | M | A | M     | J     | J     | A     | S | O | N | D     | J     | F     | M     | A | M | J |
| L2 CMWP_R01_04 Approved 29Sep20 - 4th Update DD=31Dec20 |  |     |             |             |        |        | 961   | 20-Jul-19 A | 13-Apr-24 | -56 | 0 |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| GENERAL & PRELIMINARIES                                 |  |     |             |             |        |        | 961   | 20-Jul-19 A | 13-Apr-24 | -56 | 0 |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| Contract Significant Dates                              |  |     |             |             |        |        | 844   | 20-Jul-19 A | 13-Apr-24 | -77 | 0 |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| Commencement & Completion Dates                         |  |     |             |             |        |        | 844   | 20-Jul-19 A | 13-Apr-24 | -77 | 0 |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| Section Keydates  |  |     |             |             |        |        | 844   | 21-Dec-21   | 13-Apr-24 | -77 | 0 |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| KD05  | PC for HO of the Remaining Works for M+ Promenade South  | 0   |             | 21-Dec-21*  | -91    | -29    |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| KD05A   | Complete Required Pedestrian Access Corridor and Floor Finishes at AURW                            | 0   |             | 13-May-22*  | 0      | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| KD05B   | Complete Required Pedestrian Access Corridor & associated top slab at Avenue Level [if instructed] | 0   |             | 13-May-22*  | 0      | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| KD05C   | PC for HO of Landscape Area at Avenue & Pedestrian level between P31 & P34 [if instructed]         | 0   |             | 13-May-22*  | 0      | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| KD08  | PC for HO Loc ICT/Risers Rms to APC for ICT Sys Instn Wrks   | 0   |             | 06-Jan-24*  | -68    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| KD10  | PC for HO of ASDA, Lyric Theatre Promenade South to Authority                                      | 0   |             | 06-Jan-24*  | -47    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| KD09  | PC for HO of RDE areas for Tenancy Fit-out Wrks  | 0   |             | 06-Jan-24*  | -68    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| KD11  | PC for HO of Extended Basement for HO to Authority & HO of Carriageway to Relevant Govt Authority  | 0   |             | 13-Mar-24*  | -74    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| KD07  | PRACTICAL COMPLETION for C'Way 3A (M+ Day 2 Works)   | 0   |             | 13-Apr-24*  | -77    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| KD13  | PRACTICAL COMPLETION for Lyric Theatre, Extended Basement & C'Way 3B                               | 0   |             | 13-Apr-24*  | -77    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| Stage Keydates  |  |     |             |             |        |        | 679   | 20-Jul-19 A | 09-Mar-24 | -73 | 0 |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| KD01  | Compl Dsgn Coor/Subm and obtn NNO for L1 Contr Bsmt constn wrks                                    | 0   |             | 20-Jul-19 A | 0      | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| KD06  | PC for Fountain Related Plantroom(s)   | 0   |             | 30-Apr-22*  | 0      | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| KD03  | OBTAIN OP for Lyric Theatre & Extended Basement  | 0   |             | 06-Jan-24*  | -68    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| KD14  | Complete U/G road and the associated plantrooms at Zone 3A&3B Integrated Basement                  | 0   |             | 22-Jan-24*  | -69    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| KD02  | Obtain BA14 Acknowledge from BD for M+ Day2 A&A Works  | 0   |             | 09-Mar-24*  | -73    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| Summary Program - Level 1                               |  |     |             |             |        |        | 961   | 06-May-20 A | 13-Apr-24 | -56 | 0 |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM10   | [LoE] CC_B Lyric Theatre - Substructure RC Structural Concrete                                     | 180 | 06-May-20 A | 31-Aug-21   | -71    | -5     |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM30   | [LoE] CC_H - Vibration Isolation Spring System Remaining as of 30Apr2020 (AS=30Sep19)              | 38  | 09-May-20 A | 22-Feb-21   | -40    | -6     |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM25   | [LoE] CC_E - DCS Cofferdam A Works & Obtain BA14   | 427 | 23-Jun-20 A | 28-Jul-22   | -67    | -25    |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM21   | [LoE] CC_C - LT EVA1 & EVA2  | 797 | 11-Jan-21   | 14-Dec-23   | -55    | -7     |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM26   | [LoE] CC_F - Mods to Existing Pump Cell Civil & MEP Works (Excl. Options 2 Add. Pumps)             | 200 | 25-Jan-21   | 26-Oct-21   | -39    | -7     |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM23   | [LoE] CC_C - Artist SQ. Bridge (ASB_1/2/3; ASB_3; P31_2; P34_2; AS_1/2; ASB-6/P31 EVA)             | 738 | 01-Feb-21   | 27-Oct-23   | 20     | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM24   | [LoE] CC_D - Remaining Works for M+ Promenade South  | 232 | 19-Feb-21   | 21-Dec-21   | -72    | -25    |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM14   | [LoE] CC_B Lyric Theatre - ABWF Work Including Theatres (Excl. Punch List Works)                   | 843 | 04-Mar-21   | 09-Jan-24   | -56    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM22   | [LoE] CC_C - HoR Development (P32-1, P29-1, P31-EVA)   | 636 | 30-Mar-21   | 05-Aug-23   | 59     | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM27   | [LoE] CC_G Extended Basement - ABWF Works (Incl. Deferred Areas Under Deck)                        | 623 | 02-Apr-21   | 16-May-23   | -46    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM31   | [LoE] CC_I Carriageway 3B - ABWF Works   | 488 | 02-Apr-21   | 23-Nov-22   | -23    | -1     |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM15   | [LoE] CC_B Lyric Theatre - MEP 1st to Final Fix (Excl. TH SYS, TH Non-FSD in Walls, etc.)          | 689 | 19-Apr-21   | 19-Aug-23   | -68    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM35   | [LoE] CC_J - M+ Day 2 Works (excl. connections to M+ and SZ_1 FS Changeover)                       | 727 | 19-Apr-21   | 05-Oct-23   | -52    | -3     |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM11   | [LoE] CC_B Lyric Theatre - Superstructure RC Structural Concrete                                   | 391 | 23-Apr-21   | 10-Oct-22   | -53    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM28   | [LoE] CC_G Extended Basement - MEP 1st Fix to Final Fix (Incl. Deferred Areas Under Deck)          | 581 | 03-May-21   | 24-Apr-23   | -46    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM32   | [LoE] CC_I Carriageway 3B - MEP Works (1st Fix to Final Fix)                                       | 367 | 26-Jun-21   | 21-Sep-22   | -16    | -1     |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM41   | [LoE] CC_B Lyric Theatre - Structural Steel by CSD   | 395 | 05-Aug-21   | 12-Jan-23   | -59    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM40   | [LoE] CC_N Lifts & Escalators  | 510 | 23-Aug-21   | 20-May-23   | -18    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM20   | [LoE] CC_C - LT Promenade & Pocket Square Bridge   | 550 | 01-Sep-21   | 09-Sep-23   | -25    | -18    |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM12   | [LoE] CC_B Lyric Theatre - EWS Weather Tight Type  | 296 | 22-Nov-21   | 19-Dec-22   | -64    | -16    |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM17   | [LoE] CC_B Lyric Theatre - Theatre Specialist Systems Incl. T&C, Precom. & Commissioning           | 639 | 09-Feb-22   | 13-Apr-24   | -56    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM13   | [LoE] CC_B Lyric Theatre - EWS Non-Weather Tight Type 4.1 & 4.3                                    | 281 | 22-Jun-22   | 04-Jul-23   | -46    | -3     |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM29   | [LoE] CC_G Extended Basement - T&C   | 258 | 30-Jun-22   | 16-May-23   | -46    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM39   | [LoE] CC_K - Water Main at Promenade   | 150 | 30-Jul-22   | 14-Feb-23   | -22    | -15    |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM42   | [LoE] CC_E - DCS Outside of Cofferdam A Works (Connect DIA1,600 & Remove Temp O'fall)              | 64  | 30-Jul-22   | 26-Oct-22   | -14    | -7     |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM33   | [LoE] CC_I Underpass 3B & Associated Area - T&C  | 129 | 02-Aug-22   | 04-Jan-23   | -42    | -6     |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM16   | [LoE] CC_B Lyric Theatre - T&C (Excluding Non-FSD ELV & Electrical)                                | 141 | 18-Mar-23   | 07-Sep-23   | -56    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM18   | [LoE] CC_B Lyric Theatre, EB, C'Way 3B - Stat. Insp. & Approval (from Form 314/501 to BD OP)       | 98  | 08-Sep-23   | 06-Jan-24   | -56    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM38   | [LoE] CC_J - M+ Day 2 FS Changeover in 3A SZ_1, Connections to M+, Integrated T&C                  | 99  | 22-Sep-23   | 22-Jan-24   | -56    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |
| SUM34   | [LoE] CC_J Carriageway 3A - Stat. Insp. & Approvals (from Form 314A to BA14)                       | 56  | 28-Dec-23   | 09-Mar-24   | -56    | 0      |       |             |           |     |   |      |       |       |       |       |      |   |   |       |       |       |       |   |   |   |       |       |       |       |   |   |   |



## **C. Action and Limit Levels for Construction Phase**

## **Air Quality**

The Action and Limit Levels for 1-hour and 24-hour TSP for the monitoring station are presented in following tables:

**Table C-1: Action and Limit Levels for 1-hour TSP**

| Monitoring Station | Action Level (mg/m <sup>3</sup> ) | Limit Level (mg/m <sup>3</sup> ) |
|--------------------|-----------------------------------|----------------------------------|
| AM1                | 273.7                             | 500                              |
| AM2B               | 274.2                             | 500                              |

**Table C-2: Action and Limit Levels for 24-hour TSP**

| Monitoring Station | Action Level (µg/m <sup>3</sup> ) | Limit Level (µg/m <sup>3</sup> ) |
|--------------------|-----------------------------------|----------------------------------|
| AM1                | 143.6                             | 260                              |
| AM2B               | 151.1                             | 260                              |

## **Noise**

The Action and Limit Levels for Noise for the monitoring stations are presented in following table:

**Table C-3: Action and Limit Levels for Construction Noise**

| Time Period & Monitoring Locations | Action Level                                     | Limit Level |
|------------------------------------|--|-------------|
| NM1A                               |  |             |
| 0700-1900 hours on normal weekdays | When one valid documented complaint is received. | 75 dB(A)    |

## **D. Event and Action Plan for Air Quality, Noise, Landscape and Visual Impact**

## Air Quality

In case the Action and Limit Levels are not complied during construction stage, the following Event and Action Plan should be followed:

**Table D-1: Event and Action Plan for Air Quality**

| Event   | Action  |   |   |  |
|---|---|---|---|--|
|   | ET  | IEC   | WKCD  | Contractor   |
| <b>Action Level</b>                               |   |   |   |  |
| 1. Exceedance for one sample                      | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Inform IEC and WKCD;<br>3. Repeat measurement to confirm finding;<br>4. Increase monitoring frequency to daily.   | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method.  | 1. Notify Contractor  | 1. Rectify any unacceptable practice;<br>2. Amend working methods if appropriate.  |
| 2. Exceedance for two or more consecutive samples | 1. Identify source;<br>2. Inform IEC and WKCD;<br>3. Advise the WKCD on the effectiveness of the proposed remedial measures;<br>4. Repeat measurements to confirm findings;<br>5. Increase monitoring frequency to daily;<br>6. Discuss with IEC and Contractor on remedial actions required;<br>7. If exceedance continues, arrange meeting with IEC and WKCD;<br>8. If exceedance stops, cease additional monitoring. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method;<br>3. Discuss with ET and Contractor on possible remedial measures;<br>4. Advise the ET on the effectiveness of the proposed remedial measures;<br>5. Monitor the implementation of remedial measures.   | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. Ensure remedial measures properly implemented. | 1. Submit proposals for remedial to WKCD within three working days of notification;<br>2. Implement the agreed proposals;<br>3. Amend proposal if appropriate.   |
| <b>Limit Level</b>                                |   |   |   |  |
| 1. Exceedance for one sample                      | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Inform WKCD, Contractor and EPD;<br>3. Repeat measurement to confirm finding;<br>4. Increase monitoring frequency to daily;<br>5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCD informed of the results.   | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method;<br>3. Discuss with ET and Contractor on possible remedial measures;<br>4. Advise the WKCD on the effectiveness of the proposed remedial measures;<br>5. Monitor the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. Ensure remedial measures properly implemented. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within three working days of notification;<br>3. Implement the agreed proposals;<br>4. Amend proposal if appropriate. |

## Event

## Action

|   |   |  |   |  |
|---|---|--|---|--|
| 2. Exceedance for two or more consecutive samples | <ol style="list-style-type: none"> <li>1. Notify IEC, WKCDA, Contractor and EPD;</li> <li>2. Identify source;</li> <li>3. Repeat measurement to confirm findings;</li> <li>4. Increase monitoring frequency to daily;</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>6. Arrange meeting with IEC and WKCDA to discuss the remedial actions to be taken;</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results;</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol> | <ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions;</li> <li>4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly;</li> <li>5. Monitor the implementation of remedial measures.</li> </ol> | <ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree on the remedial measures to be implemented;</li> <li>4. Ensure remedial measures properly implemented;</li> <li>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</li> </ol> | <ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to IEC within three working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Resubmit proposals if problem still not under control;</li> <li>5. Stop the relevant portion of works as determined by the WKCDA until the exceedance is abated.</li> </ol> |
|---|---|--|---|--|

## Construction Noise

In case the Action and Limit Levels are not complied during construction stage, the following Event and Action Plan should be followed:

**Table D-2: Event and Action Plan for Construction Noise**

| Event        | Action  |   |  |   |
|--------------|---|---|--|---|
|              | ET  | IEC   | WKCD   | Contractor  |
| Action Level | <ol style="list-style-type: none"> <li>1. Notify WKCD, IEC and Contractor;</li> <li>2. Carry out investigation;</li> <li>3. Report the results of investigation to the IEC, WKCD and Contractor;</li> <li>4. Discuss with the IEC and Contractor on remedial measures required;</li> <li>5. Increase monitoring frequency to check mitigation effectiveness.</li> </ol>   | <ol style="list-style-type: none"> <li>1. Review the investigation results submitted by the ET;</li> <li>2. Review the proposed remedial measures by the Contractor and advise the WKCD accordingly;</li> <li>3. Advise the WKCD on the effectiveness of the proposed remedial measures.</li> </ol> | <ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>4. Supervise the implementation of remedial measures.</li> </ol>   | <ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to IEC and WKCD;</li> <li>2. Implement noise mitigation proposals.</li> </ol>   |
| Limit Level  | <ol style="list-style-type: none"> <li>1. Inform IEC, WKCD, Contractor and EPD;</li> <li>2. Repeat measurements to confirm findings;</li> <li>3. Increase monitoring frequency;</li> <li>4. Identify source and investigate the cause of exceedance;</li> <li>5. Carry out analysis of Contractor's working procedures;</li> <li>6. Discuss with the IEC, Contractor and WKCD on remedial measures required;</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCD informed of the results;</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol> | <ol style="list-style-type: none"> <li>1. Discuss amongst WKCD, ET, and Contractor on the potential remedial actions;</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCD accordingly.</li> </ol>                                 | <ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>4. Supervise the implementation of remedial measures;</li> <li>5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated.</li> </ol> | <ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to IEC and WKCD within 3 working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Submit further proposal if problem still not under control;</li> <li>5. Stop the relevant portion of works as instructed by the WKCD until the exceedance is abated.</li> </ol> |

## Landscape and Visual Impact

In case of non-compliance of landscape and visual impacts, procedures in accordance with the Event and Action Plan should be followed:

**Table D-3: Event and Action Plan for Landscape and Visual Impact**

| Event                          | Action   |  |   |  |
|--------------------------------|--|--|---|--|
|                                | ET   | IEC  | WKCD  | Contractor   |
| Design Check                   | 1. Design check to make sure the design complies with all the proposed mitigation measures in the EIA report;<br>2. Prepare and submit report.   | 1. Check report submitted by ET;<br>2. Recommend remedial design if necessary.   | 1. Undertake remedial design if necessary.                                    | -  |
| Non-conformity on one occasion | 1. Identify source of non-conformity;<br>2. Report to IEC and WKCD;<br>3. Discuss remedial actions with IEC, WKCD and Contractor;<br>4. Monitor remedial actions until rectification has been completed.   | 1. Check and verify source of non-conformity;<br>2. Discuss remedial actions with ET and Contractor;<br>3. Advise WKCD on effectiveness of proposed remedial actions;<br>4. Check implementation of remedial actions.  | 1. Notify Contractor;<br>2. Ensure remedial actions are properly implemented. | 1. Amend working method as necessary;<br>2. Rectify damage and undertake necessary replacement and remedial actions. |
| Repeated conformity            | non-1. Identify source of non-conformity;<br>2. Report to IEC and WKCD;<br>3. Increase monitoring frequency;<br>4. Discuss remedial actions with IEC, WKCD and Contractor;<br>5. Monitor remedial actions until rectification has been completed;<br>6. If non-conformity rectified, reduce monitoring frequency back to normal. | 1. Check and verify source of non-conformity;<br>2. Check Contractor's working method;<br>3. Discuss remedial actions with ET and Contractor;<br>4. Advise WKCD on effectiveness of proposed remedial actions;<br>5. Supervise implementation of remedial actions. | 1. Notify Contractor;<br>2. Ensure remedial actions are properly implemented. | 1. Amend working method as necessary;<br>2. Rectify damage and undertake necessary replacement and remedial actions. |

## **E. Monitoring Schedule**



# January 2021

| Sunday | Monday  | Tuesday   | Wednesday | Thursday  | Friday  | Saturday                              |
|--------|---|---|-----------|---|---|---------------------------------------|
| 27     | 28  | 29  | 30        | 31  | 1   | 2                                     |
| 3      | 4<br>M+<br>Landscape & Visual Inspection                                | 5<br>AM1, AM2B - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring  | 6         | 7   | 8   | 9                                     |
| 10     | 11<br>AM1, AM2B - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring | 12  | 13        | 14  | 15<br>Lyric<br>Landscape & Visual Inspection                            | 16<br>AM1, AM2B - 24hrTSP, 1hr TSP x3 |
| 17     | 18<br>M+<br>Landscape & Visual Inspection                               | 19  | 20        | 21  | 22<br>AM1, AM2B - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring | 23                                    |
| 24     | 25<br>Lyric<br>Landscape & Visual Inspection                            | 26  | 27        | 28<br>AM1, AM2B - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring | 29  | 30                                    |
| 31     | 1   | Notes:<br>AM1 - International Commerce Centre (ICC)<br>AM2B - 1st Floor of Gammon's Site Office<br>NM1A - International Commerce Centre (ICC) |           |   |   |                                       |

# February 2021

| Sunday | Monday | Tuesday   | Wednesday   | Thursday                              | Friday | Saturday |
|--------|--------|---|---|---------------------------------------|--------|----------|
| 31     | 1      | 2   | 3<br>AM1, AM2B - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring  | 4                                     | 5      | 6        |
| 7      | 8      | 9<br>AM1, AM2B - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring  | 10  | 11<br>AM1, AM2B - 24hrTSP, 1hr TSP x3 | 12     | 13       |
| 14     | 15     | 16  | 17<br>AM1, AM2B - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring | 18                                    | 19     | 20       |
| 21     | 22     | 23<br>AM1, AM2B - 24hrTSP, 1hr TSP x3<br>NM1A - Noise Impact Monitoring   | 24  | 25                                    | 26     | 27       |
| 28     | 1      | 2   | 3   | 4                                     | 5      | 6        |
| 7      | 8      | Notes:<br>AM1 - International Commerce Centre (ICC)<br>AM2B - 1st Floor of Gammon's Site Office<br>NM1A - International Commerce Centre (ICC) |   |                                       |        |          |

## **F. Calibration Certifications**

High-Volume TSP Sampler  
5-Point Calibration Record

Location : AM1(ICC)  
Calibrated by : K.T.Ho  
Date : 20/11/2020

Sampler

Model : TE-5170  
Serial Number : S/N 0767

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454  
Service Date : 18 February 2020  
Slope (m) : 2.07134  
Intercept (b) : -0.04091  
Correlation Coefficient(r) : 0.99999

Standard Condition

Pstd (hpa) : 1013  
Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1018  
Ta(K) : 298

| Resistance Plate |          | dH [green liquid]<br>(inch water) | Z     | X=Qstd<br>(cubic meter/min) | IC<br>(chart) | Y<br>(corrected) |
|------------------|----------|-----------------------------------|-------|-----------------------------|---------------|------------------|
| 1                | 18 holes | 11.4                              | 3.385 | 1.654                       | 60            | 60.15            |
| 2                | 13 holes | 8.8                               | 2.974 | 1.455                       | 50            | 50.12            |
| 3                | 10 holes | 6.6                               | 2.575 | 1.263                       | 42            | 42.10            |
| 4                | 7 holes  | 4.6                               | 2.150 | 1.058                       | 30            | 30.07            |
| 5                | 5 holes  | 2.8                               | 1.677 | 0.830                       | 18            | 18.04            |

Notes:  $Z = \text{SQRT}\{dH(Pa/Pstd)(Tstd/Ta)\}$ ,  $X = Z/m - b$ ,  $Y(\text{Corrected Flow}) = IC * \{\text{SQRT}(Pa/Pstd)(Tstd/Ta)\}$

Sampler Calibration Relationship

Slope(m): 51.013                      Intercept(b): -23.766                      Correlation Coefficient(r): 0.9988

Checked by:   
Magnum Fan

Date: 23/11/2020

High-Volume TSP Sampler  
5-Point Calibration Record

Location : AM2B (Gammon Office)  
Calibrated by : K.T.Ho  
Date : 20/11/2020

Sampler

Model : TE-5170  
Serial Number : S/N 8919

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454  
Service Date : 18 February 2020  
Slope (m) : 2.07134  
Intercept (b) : -0.04091  
Correlation Coefficient(r) : 0.99999

Standard Condition

Pstd (hpa) : 1013  
Tstd (K) : 298.18

Calibration Condition


Pa (hpa) : 1018  
Ta(K) : 298

| Resistance Plate |          | dH [green liquid]<br>(inch water) | Z     | X=Qstd<br>(cubic meter/min) | IC<br>(chart) | Y<br>(corrected) |
|------------------|----------|-----------------------------------|-------|-----------------------------|---------------|------------------|
| 1                | 18 holes | 11.6                              | 3.414 | 1.668                       | 62            | 62.15            |
| 2                | 13 holes | 9.4                               | 3.074 | 1.504                       | 50            | 50.12            |
| 3                | 10 holes | 7.2                               | 2.690 | 1.318                       | 38            | 38.09            |
| 4                | 7 holes  | 4.6                               | 2.150 | 1.058                       | 28            | 28.07            |
| 5                | 5 holes  | 3.0                               | 1.736 | 0.858                       | 16            | 16.04            |

Notes:  $Z = \sqrt{dH(Pa/Pstd)(Tstd/Ta)}$ ,  $X = Z/m - b$ ,  $Y(\text{Corrected Flow}) = IC * \{\sqrt{Pa/Pstd}(Tstd/Ta)\}$

Sampler Calibration Relationship

Slope(m): 54.842      Intercept(b): -31.366      Correlation Coefficient(r): 0.9941

Checked by:   
Magnum Fan

Date: 23/11/2020

High-Volume TSP Sampler  
5-Point Calibration Record

Location : AM1 (ICC)  
Calibrated by : K. T. Ho  
Date : 20/01/2021

Sampler

Model : TE-5170  
Serial Number : S/N 0767

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454  
Service Date : 18 February 2020  
Slope (m) : 2.07134  
Intercept (b) : -0.04091  
Correlation Coefficient(r) : 0.99999

Standard Condition

Pstd (hpa) : 1013  
Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1019  
Ta(K) : 293

| Resistance Plate |          | dH [green liquid]<br>(inch water) | Z     | X=Qstd<br>(cubic meter/min) | IC<br>(chart) | Y<br>(corrected) |
|------------------|----------|-----------------------------------|-------|-----------------------------|---------------|------------------|
| 1                | 18 holes | 11.2                              | 3.385 | 1.654                       | 58            | 58.67            |
| 2                | 13 holes | 8.2                               | 2.896 | 1.418                       | 50            | 50.57            |
| 3                | 10 holes | 6.2                               | 2.519 | 1.236                       | 42            | 42.48            |
| 4                | 7 holes  | 4.4                               | 2.122 | 1.044                       | 32            | 32.37            |
| 5                | 5 holes  | 2.6                               | 1.631 | 0.807                       | 20            | 20.23            |

Notes:  $Z = \sqrt{dH(Pa/Pstd)(Tstd/Ta)}$ ,  $X = Z/m - b$ ,  $Y(\text{Corrected Flow}) = IC * \{\sqrt{dH(Pa/Pstd)(Tstd/Ta)}\}$

Sampler Calibration Relationship (Linear Regression)

Slope(m): 45.943                      Intercept(b): -15.729                      Correlation Coefficient(r): 0.9960

Checked by: Magnum Fan

Date: 25/01/2021

High-Volume TSP Sampler  
5-Point Calibration Record

Location : AM2B(Gammon Office)  
Calibrated by : K. T. Ho  
Date : 20/01/2021

Sampler

Model : TE-5170  
Serial Number : S/N 8919

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454  
Service Date : 18 February 2020  
Slope (m) : 2.07134  
Intercept (b) : -0.04091  
Correlation Coefficient(r) : 0.99999

Standard Condition

Pstd (hpa) : 1013  
Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1019  
Ta(K) : 293

| Resistance Plate |          | dH [green liquid]<br>(inch water) | Z     | X=Qstd<br>(cubic meter/min) | IC<br>(chart) | Y<br>(corrected) |
|------------------|----------|-----------------------------------|-------|-----------------------------|---------------|------------------|
| 1                | 18 holes | 12.4                              | 3.562 | 1.739                       | 60            | 60.69            |
| 2                | 13 holes | 9.0                               | 3.034 | 1.485                       | 54            | 54.62            |
| 3                | 10 holes | 6.4                               | 2.559 | 1.255                       | 45            | 45.52            |
| 4                | 7 holes  | 4.2                               | 2.073 | 1.021                       | 32            | 32.37            |
| 5                | 5 holes  | 2.2                               | 1.500 | 0.744                       | 22            | 22.25            |

Notes:  $Z = \sqrt{dH(Pa/Pstd)(Tstd/Ta)}$ ,  $X = Z/m - b$ ,  $Y(\text{Corrected Flow}) = IC * \{\sqrt{dH(Pa/Pstd)(Tstd/Ta)}\}$

Sampler Calibration Relationship (Linear Regression)

Slope(m): 40.342                      Intercept(b): -7.287                      Correlation Coefficient(r): 0.9919

Checked by: Magnum Fan

Date: 25/01/2021



## Certificate of Calibration

### Calibration Certification Information

|                               |                       |                 |
|-------------------------------|-----------------------|-----------------|
| Cal. Date: February 18, 2020  | Rootmeter S/N: 438320 | Ta: 29.4 °K     |
| Operator: Jim Tisch           |                       | Pa: 753.1 mm Hg |
| Calibration Model #: TE-5025A | Calibrator S/N: 2454  |                 |

| Run | Vol. Init (m3) | Vol. Final (m3) | ΔVol. (m3) | ΔTime (min) | ΔP (mm Hg) | ΔH (in H2O) |
|-----|----------------|-----------------|------------|-------------|------------|-------------|
| 1   | 1              | 2               | 1          | 1.4190      | 5.2        | 2.00        |
| 2   | 3              | 4               | 1          | 1.0100      | 6.4        | 4.00        |
| 3   | 5              | 6               | 1          | 0.9020      | 7.9        | 5.00        |
| 4   | 7              | 8               | 1          | 0.8600      | 8.8        | 5.50        |
| 5   | 9              | 10              | 1          | 0.7110      | 12.7       | 8.00        |

### 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) |
|-----------|---------------|--|--------|-------------|---|
| 1.0001    | 0.7048        | 1.4173   | 0.9958 | 0.7017      | 0.8836  |
| 0.9959    | 0.9860        | 2.0044   | 0.9915 | 0.9817      | 1.2496  |
| 0.9939    | 1.1019        | 2.2410   | 0.9895 | 1.0970      | 1.3971  |
| 0.9927    | 1.1543        | 2.3504   | 0.9883 | 1.1492      | 1.4653  |
| 0.9875    | 1.3889        | 2.8347   | 0.9831 | 1.3828      | 1.7672  |
| QSTD      |               | m= 2.07134   | QA     |             | m= 1.29704  |
|           |               | b= -0.04091  |        |             | b= -0.02551   |
|           |               | r= 0.99999   |        |             | r= 0.99999  |

### Calculations

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

### Standard Conditions

|       |                                       |
|-------|---------------------------------------|
| Tstd: | 298.15 °K                             |
| Pstd: | 760 mm Hg                             |
| Key   |                                       |
| ΔH:   | calibrator manometer reading (in H2O) |
| ΔP:   | rootmeter 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





### SUB-CONTRACTING REPORT

|         |   |                |                    |
|---------|---|----------------|--------------------|
| CONTACT | : MR K.W. FAN   | WORK ORDER     | : <b>HK2045301</b> |
| CLIENT  | : <b>ENVIROTECH SERVICES CO.</b>                                    |                |                    |
| ADDRESS | : RM113, 1/F, MY LOFT, 9 HOI WING ROAD,<br>TUEN MUN, N.T. HONG KONG | SUB-BATCH      | : 1                |
|         |   | DATE RECEIVED  | : 24-NOV-2020      |
|         |   | DATE OF ISSUE  | : 30-NOV-2020      |
| PROJECT | : ----  | NO. OF SAMPLES | : 1                |
|         |   | CLIENT ORDER   | : ----             |

### General Comments

- Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition. The result(s) related only to the item(s) tested.
- Sample information (Project name, Sample ID, Sampling date/time, etc., if any) is provided by client.
- Calibration was subcontracted to and analysed by Action United Enviro Services.

### Signatories

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

Signatories

Position

Richard Fung

Managing Director

This is the Final Report and supersedes any preliminary report with this batch number.

All pages of this report have been checked and approved for release.

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

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

WORK ORDER : HK2045301  
SUB-BATCH : 1  
CLIENT : ENVIROTECH SERVICES CO.  
PROJECT : ----



| ALS Lab ID    | Client's Sample ID | Sample Type | Sample Date | External Lab Report No. |
|---------------|--------------------|-------------|-------------|-------------------------|
| HK2045301-001 | S/N: 245833        | Equipments  | 24-Nov-2020 | S/N: 245833             |

## Equipment Verification Report (TSP)

### Equipment Calibrated:

Type: Laser Dust monitor  
Manufacturer: Sibata LD-3B  
Serial No. 245833  
Equipment Ref: Nil  
Job Order HK2045301

### Standard Equipment:

Standard Equipment: Higher Volume Sampler (TSP)  
Location & Location ID: AUES office (calibration room)  
Equipment Ref: HVS 018  
Last Calibration Date: 8 October 2020

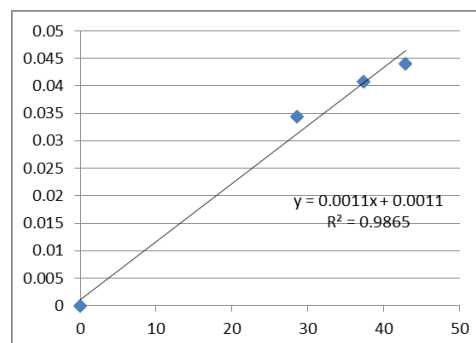
### Equipment Verification Results:

Verification Date: 26 November 2020

| Hour     | Time          | Mean Temp °C | Mean Pressure (hPa) | Concentration in mg/m <sup>3</sup> (Standard Equipment) | Total Count (Calibrated Equipment) | Count/Minute (Total Count/min) |
|----------|---------------|--------------|---------------------|---|------------------------------------|--------------------------------|
| 2hr01min | 09:18 ~ 11:19 | 24.0         | 1019.3              | 0.041   | 4525                               | 37.3                           |
| 2hr      | 11:22 ~ 13:22 | 24.0         | 1019.3              | 0.034   | 3430                               | 28.6                           |
| 2hr01min | 13:25 ~ 15:26 | 24.0         | 1019.3              | 0.044   | 5196                               | 42.9                           |

### Linear Regression of Y or X

Slope (K-factor): 0.0011  
Correlation Coefficient 0.9932  
Date of Issue 30 November 2020



### Remarks:

1. **Strong** Correlation ( $R > 0.8$ )
2. Factor 0.0011 should be applied for TSP monitoring

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

Operator : Fai So Signature :  Date : 30 November 2020

QC Reviewer : Ben Tam Signature :  Date : 30 November 2020



### SUB-CONTRACTING REPORT

|         |   |                |                    |
|---------|---|----------------|--------------------|
| CONTACT | : MR K.W. FAN   | WORK ORDER     | : <b>HK2045304</b> |
| CLIENT  | : <b>ENVIROTECH SERVICES CO.</b>                                    |                |                    |
| ADDRESS | : RM113, 1/F, MY LOFT, 9 HOI WING ROAD,<br>TUEN MUN, N.T. HONG KONG | SUB-BATCH      | : 1                |
|         |   | DATE RECEIVED  | : 24-NOV-2020      |
|         |   | DATE OF ISSUE  | : 30-NOV-2020      |
| PROJECT | : ----  | NO. OF SAMPLES | : 1                |
|         |   | CLIENT ORDER   | : ----             |

#### General Comments

- Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition. The result(s) related only to the item(s) tested.
- Sample information (Project name, Sample ID, Sampling date/time, etc., if any) is provided by client.
- Calibration was subcontracted to and analysed by Action United Enviro Services.

#### Signatories

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

Signatories

Position

Richard Fung

Managing Director

This is the Final Report and supersedes any preliminary report with this batch number.

All pages of this report have been checked and approved for release.

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

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Tel. +852 2610 1044 Fax. +852 2610 2021 [www.alsglobal.com](http://www.alsglobal.com)

WORK ORDER : HK2045304  
SUB-BATCH : 1  
CLIENT : ENVIROTECH SERVICES CO.  
PROJECT : ----



| ALS Lab ID    | Client's Sample ID | Sample Type | Sample Date | External Lab Report No. |
|---------------|--------------------|-------------|-------------|-------------------------|
| HK2045304-001 | S/N: 276015        | Equipments  | 24-Nov-2020 | S/N: 276015             |

## Equipment Verification Report (TSP)

### Equipment Calibrated:

Type: Laser Dust monitor  
Manufacturer: Sibata LD-3B  
Serial No. 276015  
Equipment Ref: Nil  
Job Order HK2045304

### Standard Equipment:

Standard Equipment: Higher Volume Sampler (TSP)  
Location & Location ID: AUES office (calibration room)  
Equipment Ref: HVS 018  
Last Calibration Date: 8 October 2020

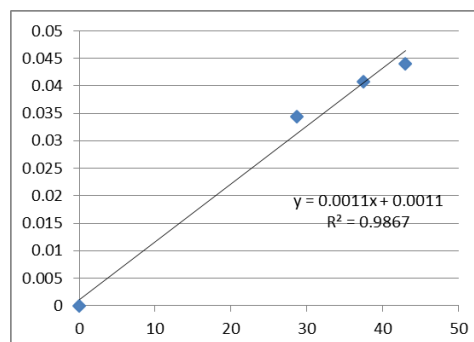
### Equipment Verification Results:

Verification Date: 26 November 2020

| Hour     | Time          | Mean Temp °C | Mean Pressure (hPa) | Concentration in mg/m <sup>3</sup> (Standard Equipment) | Total Count (Calibrated Equipment) | Count/Minute (Total Count/min) |
|----------|---------------|--------------|---------------------|---|------------------------------------|--------------------------------|
| 2hr01min | 09:18 ~ 11:19 | 24.0         | 1019.3              | 0.041   | 4541                               | 37.5                           |
| 2hr      | 11:22 ~ 13:22 | 24.0         | 1019.3              | 0.034   | 3443                               | 28.7                           |
| 2hr01min | 13:25 ~ 15:26 | 24.0         | 1019.3              | 0.044   | 5211                               | 43.0                           |

### Linear Regression of Y or X

Slope (K-factor): 0.0011  
Correlation Coefficient 0.9933  
Date of Issue 30 November 2020



### Remarks:

1. **Strong** Correlation ( $R > 0.8$ )
2. Factor 0.0011 should be applied for TSP monitoring

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

Operator : Fai So Signature :  Date : 30 November 2020

QC Reviewer : Ben Tam Signature :  Date : 30 November 2020



輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

# Certificate of Calibration

## 校正證書

Certificate No. : C203822

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC20-1389)

Date of Receipt / 收件日期 : 30 June 2020

Description / 儀器名稱 : Sound Level Meter

Manufacturer / 製造商 : Rion

Model No. / 型號 : NL-52

Serial No. / 編號 : 01010406

Supplied By / 委託者 : Envirotech Services Co.

Room 113, 1/F, My Loft, 9 Hoi Wing Road, Tuen Mun,  
New Territories, Hong Kong

### TEST CONDITIONS / 測試條件

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

Relative Humidity / 相對濕度 :  $(50 \pm 25)\%$

Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 9 July 2020

### TEST RESULTS / 測試結果

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

The results do not exceed manufacturer's specification.

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
- Fluke Everett Service Center, USA
- The Bruel & Kjaer Calibration Laboratory, Denmark

Tested By

測試

:

*Chen*

K P Cheuk  
Assistant Engineer

Certified By

核證

:

*K C Lee*

K C Lee  
Engineer

Date of Issue

簽發日期

:

10 July 2020

The test equipment used for calibration is traceable to the National 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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Sun Creation Engineering Limited - Calibration & Testing Laboratory

c/o 4/F, 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四樓

Tel/電話: (852) 2927 2606

Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com



# Certificate of Calibration

## 校正證書

Certificate No. : C203822  
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- Self-calibration was performed before the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

| Equipment ID | Description                         | Certificate No. |
|--------------|-------------------------------------|-----------------|
| CL280        | 40 MHz Arbitrary Waveform Generator | C200258         |
| CL281        | Multifunction Acoustic Calibrator   | CDK1806821      |

- Test procedure : MA101N.

- Results :

### 6.1 Sound Pressure Level

#### 6.1.1 Reference Sound Pressure Level

| UUT Setting |                |                     |                | Applied Value |             | UUT Reading | IEC 61672 Class 1 Spec. |
|-------------|----------------|---------------------|----------------|---------------|-------------|-------------|-------------------------|
| Range (dB)  | Function       | Frequency Weighting | Time Weighting | Level (dB)    | Freq. (kHz) | (dB)        | (dB)                    |
| 30 - 130    | L <sub>A</sub> | A                   | Fast           | 94.00         | 1           | 93.8        | ± 1.1                   |

#### 6.1.2 Linearity

| UUT Setting |                |                     |                | Applied Value |             | UUT Reading |
|-------------|----------------|---------------------|----------------|---------------|-------------|-------------|
| Range (dB)  | Function       | Frequency Weighting | Time Weighting | Level (dB)    | Freq. (kHz) | (dB)        |
| 30 - 130    | L <sub>A</sub> | A                   | Fast           | 94.00         | 1           | 93.8 (Ref.) |
|             |                |                     |                | 104.00        |             | 103.9       |
|             |                |                     |                | 114.00        |             | 113.8       |

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

#### 6.2 Time Weighting

| UUT Setting |                |                     |                | Applied Value |             | UUT Reading | IEC 61672 Class 1 Spec. |
|-------------|----------------|---------------------|----------------|---------------|-------------|-------------|-------------------------|
| Range (dB)  | Function       | Frequency Weighting | Time Weighting | Level (dB)    | Freq. (kHz) | (dB)        | (dB)                    |
| 30 - 130    | L <sub>A</sub> | A                   | Fast           | 94.00         | 1           | 93.8        | Ref.                    |
|             |                |                     | Slow           |               |             | 93.8        | ± 0.3                   |

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# Certificate of Calibration

## 校正證書

Certificate No. : C203822

證書編號

### 6.3 Frequency Weighting

#### 6.3.1 A-Weighting

| UUT Setting |                |                     |                | Applied Value |          | UUT Reading (dB) | IEC 61672 Class 1 Spec. (dB) |
|-------------|----------------|---------------------|----------------|---------------|----------|------------------|------------------------------|
| Range (dB)  | Function       | Frequency Weighting | Time Weighting | Level (dB)    | Freq.    |                  |                              |
| 30 - 130    | L <sub>A</sub> | A                   | Fast           | 94.00         | 63 Hz    | 67.5             | -26.2 ± 1.5                  |
|             |                |                     |                |               | 125 Hz   | 77.6             | -16.1 ± 1.5                  |
|             |                |                     |                |               | 250 Hz   | 85.1             | -8.6 ± 1.4                   |
|             |                |                     |                |               | 500 Hz   | 90.6             | -3.2 ± 1.4                   |
|             |                |                     |                |               | 1 kHz    | 93.8             | Ref.                         |
|             |                |                     |                |               | 2 kHz    | 95.1             | +1.2 ± 1.6                   |
|             |                |                     |                |               | 4 kHz    | 94.9             | +1.0 ± 1.6                   |
|             |                |                     |                |               | 8 kHz    | 92.8             | -1.1 (+2.1 ; -3.1)           |
|             |                |                     |                |               | 12.5 kHz | 89.4             | -4.3 (+3.0 ; -6.0)           |

#### 6.3.2 C-Weighting

| UUT Setting |                |                     |                | Applied Value |          | UUT Reading (dB) | IEC 61672 Class 1 Spec. (dB) |
|-------------|----------------|---------------------|----------------|---------------|----------|------------------|------------------------------|
| Range (dB)  | Function       | Frequency Weighting | Time Weighting | Level (dB)    | Freq.    |                  |                              |
| 30 - 130    | L <sub>C</sub> | C                   | Fast           | 94.00         | 63 Hz    | 92.9             | -0.8 ± 1.5                   |
|             |                |                     |                |               | 125 Hz   | 93.6             | -0.2 ± 1.5                   |
|             |                |                     |                |               | 250 Hz   | 93.8             | 0.0 ± 1.4                    |
|             |                |                     |                |               | 500 Hz   | 93.8             | 0.0 ± 1.4                    |
|             |                |                     |                |               | 1 kHz    | 93.8             | Ref.                         |
|             |                |                     |                |               | 2 kHz    | 93.7             | -0.2 ± 1.6                   |
|             |                |                     |                |               | 4 kHz    | 93.0             | -0.8 ± 1.6                   |
|             |                |                     |                |               | 8 kHz    | 90.9             | -3.0 (+2.1 ; -3.1)           |
|             |                |                     |                |               | 12.5 kHz | 87.5             | -6.2 (+3.0 ; -6.0)           |

The test equipment used for calibration is traceable to the National 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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# Certificate of Calibration

## 校正證書

Certificate No. : C203822  
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 04871

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

|        |                 |                              |
|--------|-----------------|------------------------------|
| 94 dB  | 63 Hz - 125 Hz  | : $\pm 0.35$ dB              |
|        | 250 Hz - 500 Hz | : $\pm 0.30$ dB              |
|        | 1 kHz           | : $\pm 0.20$ dB              |
|        | 2 kHz - 4 kHz   | : $\pm 0.35$ dB              |
|        | 8 kHz           | : $\pm 0.45$ dB              |
|        | 12.5 kHz        | : $\pm 0.70$ dB              |
| 104 dB | 1 kHz           | : $\pm 0.10$ dB (Ref. 94 dB) |
| 114 dB | 1 kHz           | : $\pm 0.10$ dB (Ref. 94 dB) |

- 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 is traceable to the National 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 & Testing Laboratory

# Certificate of Calibration

## 校正證書

Certificate No. : C202843

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC20-1013)

Date of Receipt / 收件日期 : 12 May 2020

Description / 儀器名稱 : Precision Acoustic Calibrator

Manufacturer / 製造商 : LARSON DAVIS

Model No. / 型號 : CAL200

Serial No. / 編號 : 11333

Supplied By / 委託者 : Envirotech Services Co.

Room 113, 1/F, My Loft, 9 Hoi Wing Road, Tuen Mun,  
New Territories, Hong Kong

### TEST CONDITIONS / 測試條件

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

Relative Humidity / 相對濕度 :  $(50 \pm 25)\%$

Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 23 May 2020

### TEST RESULTS / 測試結果

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

The results do not exceed manufacturer's specification.

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
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By

測試

H T Wong  
Assistant Engineer

Certified By

核證

K C Lee  
Engineer

Date of Issue

簽發日期

25 May 2020

The test equipment used for calibration is traceable to the National 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 & Testing Laboratory

# Certificate of Calibration

## 校正證書

Certificate No. : C202843

證書編號

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

| <u>Equipment ID</u> | <u>Description</u>                | <u>Certificate No.</u> |
|---------------------|-----------------------------------|------------------------|
| CL130               | Universal Counter                 | C193756                |
| CL281               | Multifunction Acoustic Calibrator | CDK1806821             |
| TST150A             | Measuring Amplifier               | C201309                |

4. Test procedure : MA100N.

5. Results :

### 5.1 Sound Level Accuracy

| UUT<br>Nominal Value | Measured Value<br>(dB) | Mfr's Spec.<br>(dB) | Uncertainty of Measured Value<br>(dB) |
|----------------------|------------------------|---------------------|---------------------------------------|
| 94 dB, 1 kHz         | 93.8                   | ± 0.2               | ± 0.2                                 |
| 114 dB, 1 kHz        | 113.8                  |                     |                                       |

### 5.2 Frequency Accuracy

| UUT Nominal Value<br>(kHz) | Measured Value<br>(kHz) | Mfr's<br>Spec. | Uncertainty of Measured Value<br>(Hz) |
|----------------------------|-------------------------|----------------|---------------------------------------|
| 1                          | 1.000                   | 1 kHz ± 1 %    | ± 1                                   |

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.

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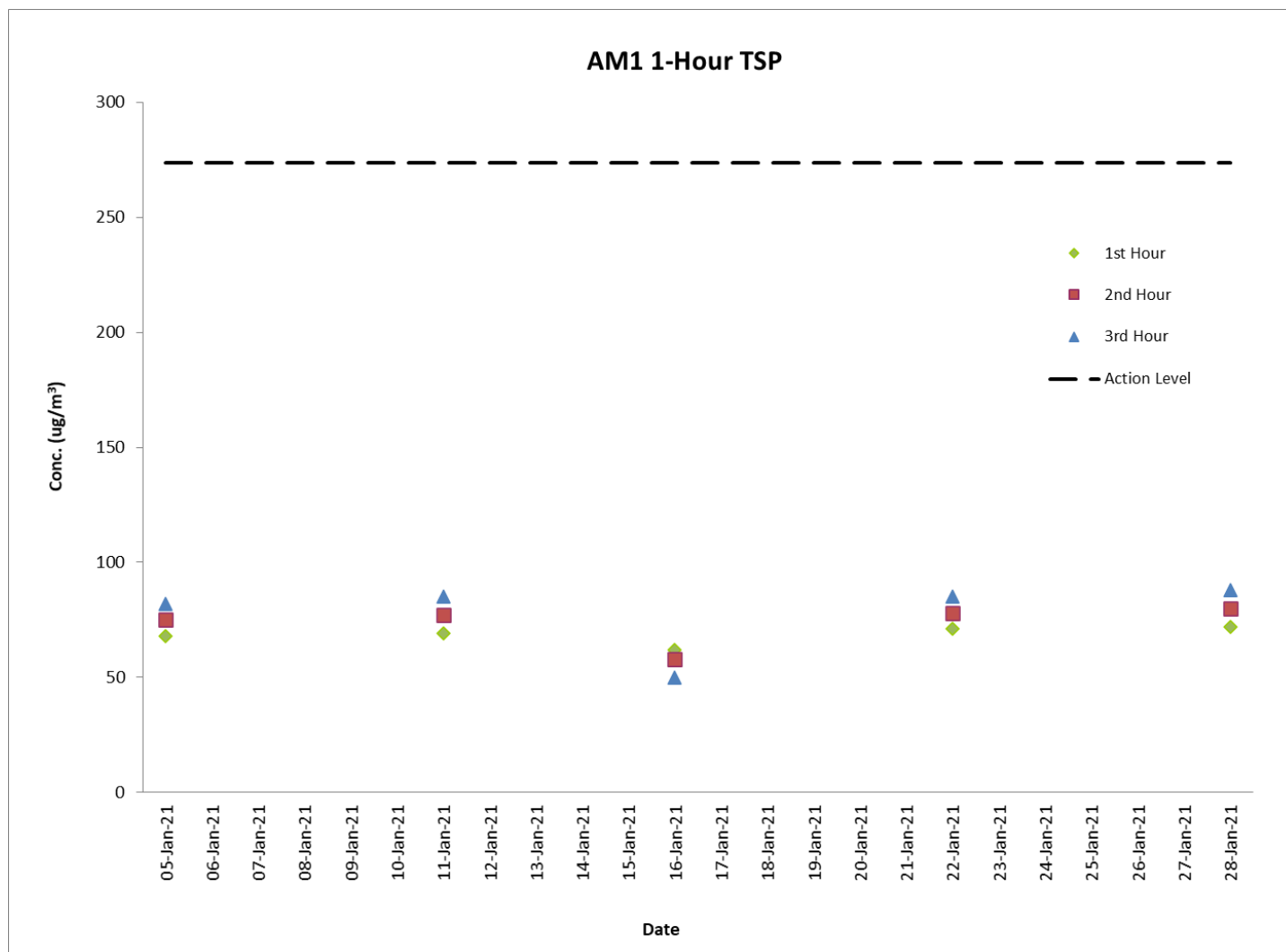
Website/網址: www.suncreation.com

## **G. Graphical Plots of the Monitoring Results**

# **Air Quality Monitoring Result at Station AM1 (1-hour TSP)**

| Date      | Weather Condition | Time |   |       | Conc. ( $\mu\text{g}/\text{m}^3$ ) |                      |                      | Action Level<br>( $\mu\text{g}/\text{m}^3$ ) | Limit Level<br>( $\mu\text{g}/\text{m}^3$ ) |
|-----------|-------------------|------|---|-------|------------------------------------|----------------------|----------------------|--|---|
|           |                   |      |   |       | 1 <sup>st</sup> Hour               | 2 <sup>nd</sup> Hour | 3 <sup>rd</sup> Hour |  |   |
| 05-Jan-21 | Cloudy            | 8:22 | - | 11:22 | 68                                 | 75                   | 82                   | 273.7  | 500   |
| 11-Jan-21 | Cloudy            | 8:22 | - | 11:22 | 69                                 | 77                   | 85                   | 273.7  | 500   |
| 16-Jan-21 | Sunny             | 8:32 | - | 11:32 | 62                                 | 58                   | 50                   | 273.7  | 500   |
| 22-Jan-21 | Fine              | 8:27 | - | 11:27 | 71                                 | 78                   | 85                   | 273.7  | 500   |
| 28-Jan-21 | Sunny             | 8:33 | - | 11:33 | 72                                 | 80                   | 88                   | 273.7  | 500   |

Graphical Presentation of Air Quality Monitoring Result at Station AM1 (1-hour TSP)

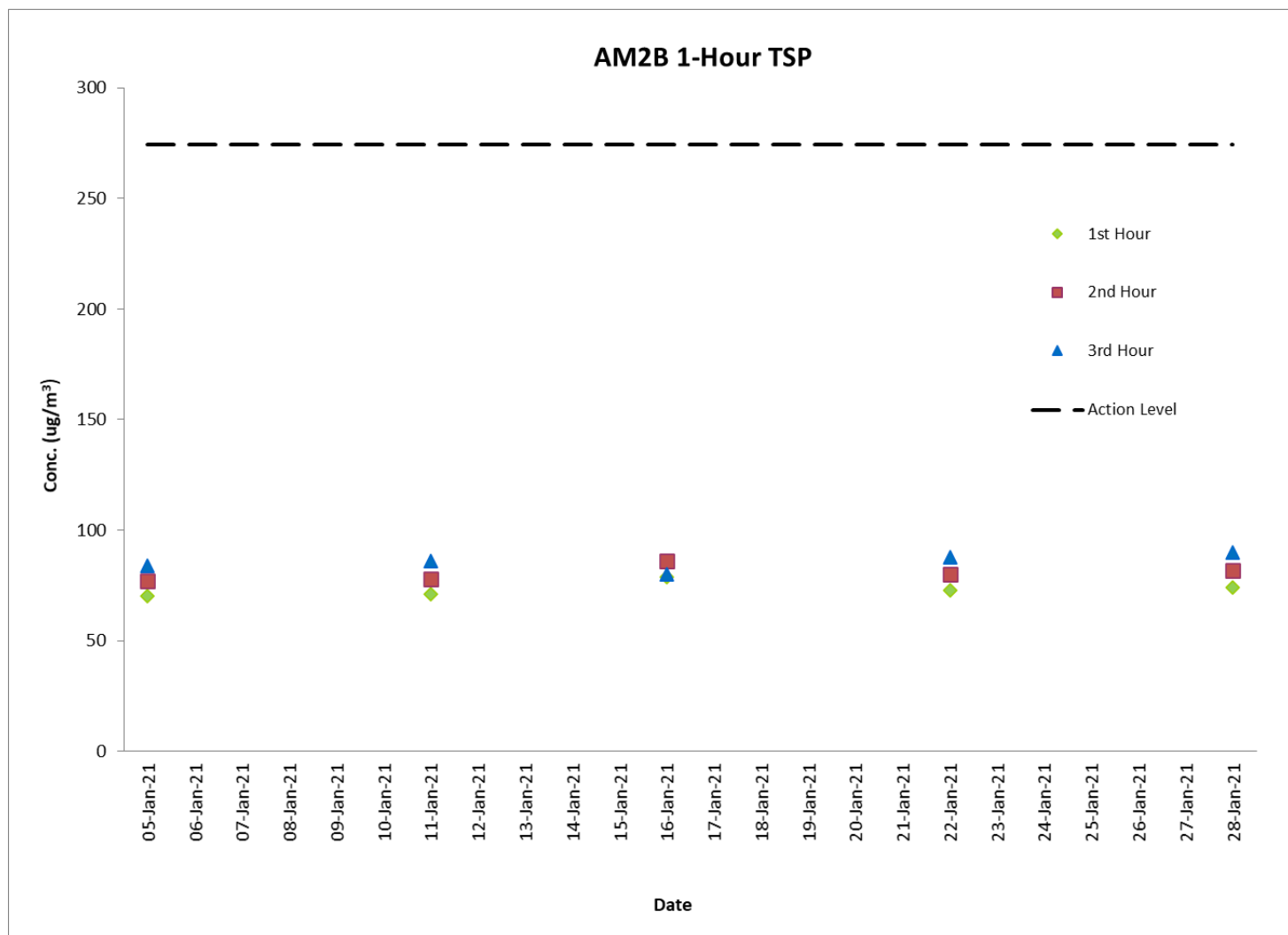


**Air Quality Monitoring Result at Station AM2B (1-hour TSP)**

| Date      | Weather Condition | Time         | Conc. ( $\mu\text{g}/\text{m}^3$ ) |                      |                      | Action Level<br>( $\mu\text{g}/\text{m}^3$ ) | Limit Level<br>( $\mu\text{g}/\text{m}^3$ ) |
|-----------|-------------------|--------------|------------------------------------|----------------------|----------------------|--|---|
|           |                   |              | 1 <sup>st</sup> Hour               | 2 <sup>nd</sup> Hour | 3 <sup>rd</sup> Hour |  |   |
| 05-Jan-21 | Cloudy            | 8:38 - 11:38 | 70                                 | 77                   | 84                   | 274.2  | 500   |
| 11-Jan-21 | Cloudy            | 8:36 - 11:36 | 71                                 | 78                   | 86                   | 274.2  | 500   |
| 16-Jan-21 | Sunny             | 8:48 - 11:48 | 79                                 | 86                   | 80                   | 274.2  | 500   |
| 22-Jan-21 | Fine              | 8:43 - 11:43 | 73                                 | 80                   | 88                   | 274.2  | 500   |
| 28-Jan-21 | Sunny             | 8:47 - 11:47 | 74                                 | 82                   | 90                   | 274.2  | 500   |



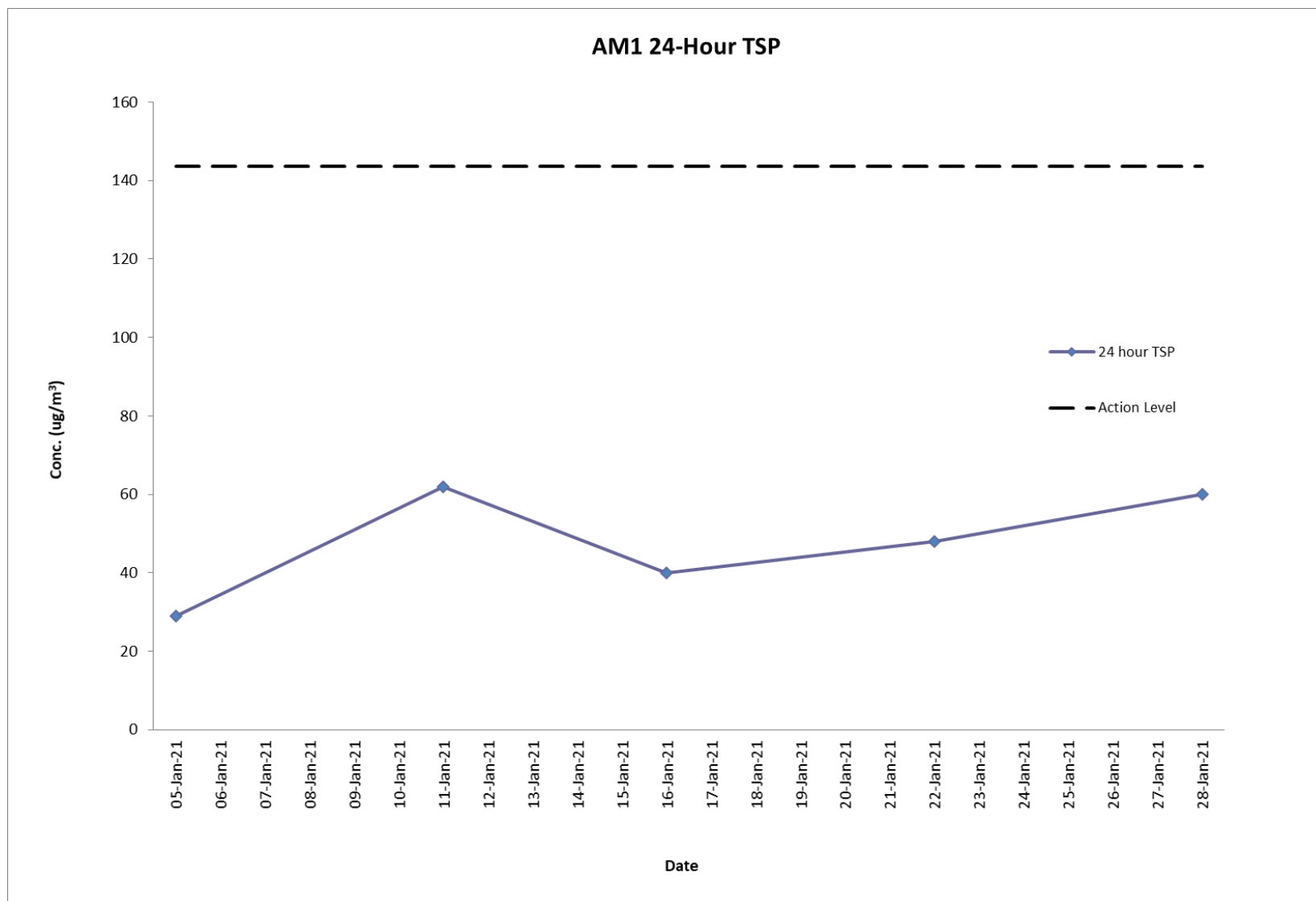
Graphical Presentation of Air Quality Monitoring Result at Station AM2B (1-hour TSP)



### Air Quality Monitoring Result at Station AM1 (24-hour TSP)

| Start     |       | Finish    |       | Filter Weight (g) |        | Elapsed Time Reading |          | Sampling Time (hrs) | Flow Rate (m <sup>3</sup> /min) |       |         | Conc. (µg/m <sup>3</sup> ) | Weather Condition | Action Level | Limit Level |
|-----------|-------|-----------|-------|-------------------|--------|----------------------|----------|---------------------|---------------------------------|-------|---------|----------------------------|-------------------|--------------|-------------|
| Date      | Time  | Date      | Time  | Initial           | Final  | Initial              | Final    |                     | Initial                         | Final | Average |                            |                   |              |             |
| 05-Jan-21 | 08:20 | 06-Jan-21 | 08:20 | 2.6819            | 2.7364 | 22784.38             | 22808.38 | 24                  | 1.29                            | 1.29  | 1.29    | 29                         | Cloudy            | 143.6        | 260         |
| 11-Jan-21 | 10:20 | 12-Jan-21 | 10:20 | 2.6881            | 2.8030 | 22808.38             | 22832.38 | 24                  | 1.29                            | 1.29  | 1.29    | 62                         | Cloudy            | 143.6        | 260         |
| 16-Jan-21 | 08:30 | 17-Jan-21 | 08:30 | 2.6861            | 2.7596 | 22832.38             | 22856.38 | 24                  | 1.29                            | 1.29  | 1.29    | 40                         | Sunny             | 143.6        | 260         |
| 22-Jan-21 | 08:25 | 23-Jan-21 | 08:25 | 2.6906            | 2.7778 | 22856.38             | 22880.38 | 24                  | 1.26                            | 1.26  | 1.26    | 48                         | Fine              | 143.6        | 260         |
| 28-Jan-21 | 08:30 | 29-Jan-21 | 08:30 | 2.7286            | 2.8375 | 22880.38             | 22904.38 | 24                  | 1.26                            | 1.26  | 1.26    | 60                         | Sunny             | 143.6        | 260         |

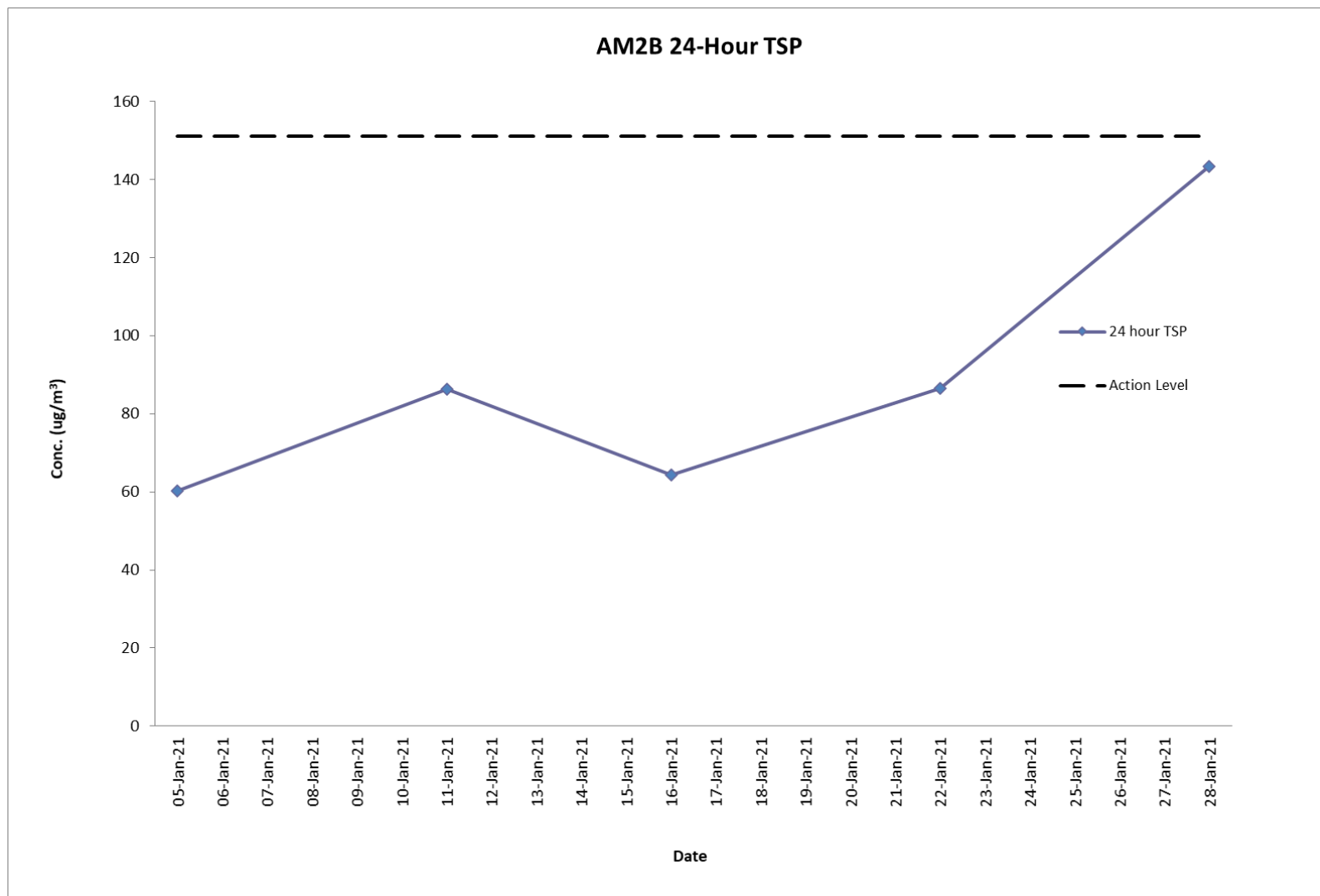
Graphical Presentation of Air Quality Monitoring Result at Station AM1 (24-hour TSP)



### Air Quality Monitoring Result at Station AM2B (24-hour TSP)

| Start     |       | Finish    |       | Filter Weight (g) |        | Elapsed Time Reading |          | Sampling Time (hrs) | Flow Rate (m <sup>3</sup> /min) |       |         | Conc. (µg/m <sup>3</sup> ) | Weather Condition | Action Level | Limit Level |
|-----------|-------|-----------|-------|-------------------|--------|----------------------|----------|---------------------|---------------------------------|-------|---------|----------------------------|-------------------|--------------|-------------|
| Date      | Time  | Date      | Time  | Initial           | Final  | Initial              | Final    |                     | Initial                         | Final | Average |                            |                   |              |             |
| 05-Jan-21 | 08:36 | 06-Jan-21 | 08:36 | 2.6815            | 2.7977 | 22339.05             | 22363.05 | 24                  | 1.34                            | 1.34  | 1.34    | 60                         | Cloudy            | 151.1        | 260         |
| 11-Jan-21 | 08:34 | 12-Jan-21 | 08:34 | 2.6823            | 2.8487 | 22363.05             | 22387.05 | 24                  | 1.34                            | 1.34  | 1.34    | 86                         | Cloudy            | 151.1        | 260         |
| 16-Jan-21 | 08:46 | 17-Jan-21 | 08:46 | 2.6845            | 2.8088 | 22387.05             | 22411.05 | 24                  | 1.34                            | 1.34  | 1.34    | 64                         | Sunny             | 151.1        | 260         |
| 22-Jan-21 | 08:40 | 23-Jan-21 | 08:40 | 2.6823            | 2.8343 | 22411.05             | 22435.05 | 24                  | 1.22                            | 1.22  | 1.22    | 87                         | Fine              | 151.1        | 260         |
| 28-Jan-21 | 08:45 | 29-Jan-21 | 08:45 | 2.6676            | 2.9193 | 22435.05             | 22459.05 | 24                  | 1.22                            | 1.22  | 1.22    | 143                        | Sunny             | 151.1        | 260         |

Graphical Presentation of Air Quality Monitoring Result at Station AM2B (24-hour TSP)



# **Noise Monitoring Result at Station NM1A**

| Date      | Time  | Measured $L_{10}$ , dB(A) | Measured $L_{90}$ , dB(A) | $L_{eq}$ (30 min.)*, dB(A) |
|-----------|-------|---------------------------|---------------------------|----------------------------|
| 05-Jan-21 | 09:24 | 66.5                      | 62.7                      | 68                         |
| 05-Jan-21 | 09:29 | 65.4                      | 61.5                      |                            |
| 05-Jan-21 | 09:34 | 65.3                      | 61.7                      |                            |
| 05-Jan-21 | 09:39 | 66.7                      | 62.0                      |                            |
| 05-Jan-21 | 09:44 | 67.2                      | 63.3                      |                            |
| 05-Jan-21 | 09:49 | 67.0                      | 63.9                      |                            |
| 11-Jan-21 | 09:05 | 67.0                      | 63.7                      | 68                         |
| 11-Jan-21 | 09:10 | 66.4                      | 62.3                      |                            |
| 11-Jan-21 | 09:15 | 66.4                      | 62.2                      |                            |
| 11-Jan-21 | 09:20 | 68.5                      | 64.1                      |                            |
| 11-Jan-21 | 09:25 | 67.5                      | 63.8                      |                            |
| 11-Jan-21 | 09:30 | 66.2                      | 62.6                      |                            |
| 22-Jan-21 | 09:30 | 66.2                      | 62.6                      | 68                         |
| 22-Jan-21 | 09:35 | 67.4                      | 63.1                      |                            |
| 22-Jan-21 | 09:40 | 68.6                      | 64.5                      |                            |
| 22-Jan-21 | 09:45 | 66.3                      | 62.5                      |                            |
| 22-Jan-21 | 09:50 | 66.8                      | 62.6                      |                            |
| 22-Jan-21 | 09:55 | 67.0                      | 63.3                      |                            |
| 28-Jan-21 | 09:36 | 66.0                      | 62.1                      | 68                         |
| 28-Jan-21 | 09:41 | 67.3                      | 63.9                      |                            |
| 28-Jan-21 | 09:46 | 68.4                      | 64.5                      |                            |
| 28-Jan-21 | 09:51 | 66.1                      | 62.3                      |                            |
| 28-Jan-21 | 09:56 | 66.4                      | 62.6                      |                            |
| 28-Jan-21 | 10:01 | 67.7                      | 63.9                      |                            |

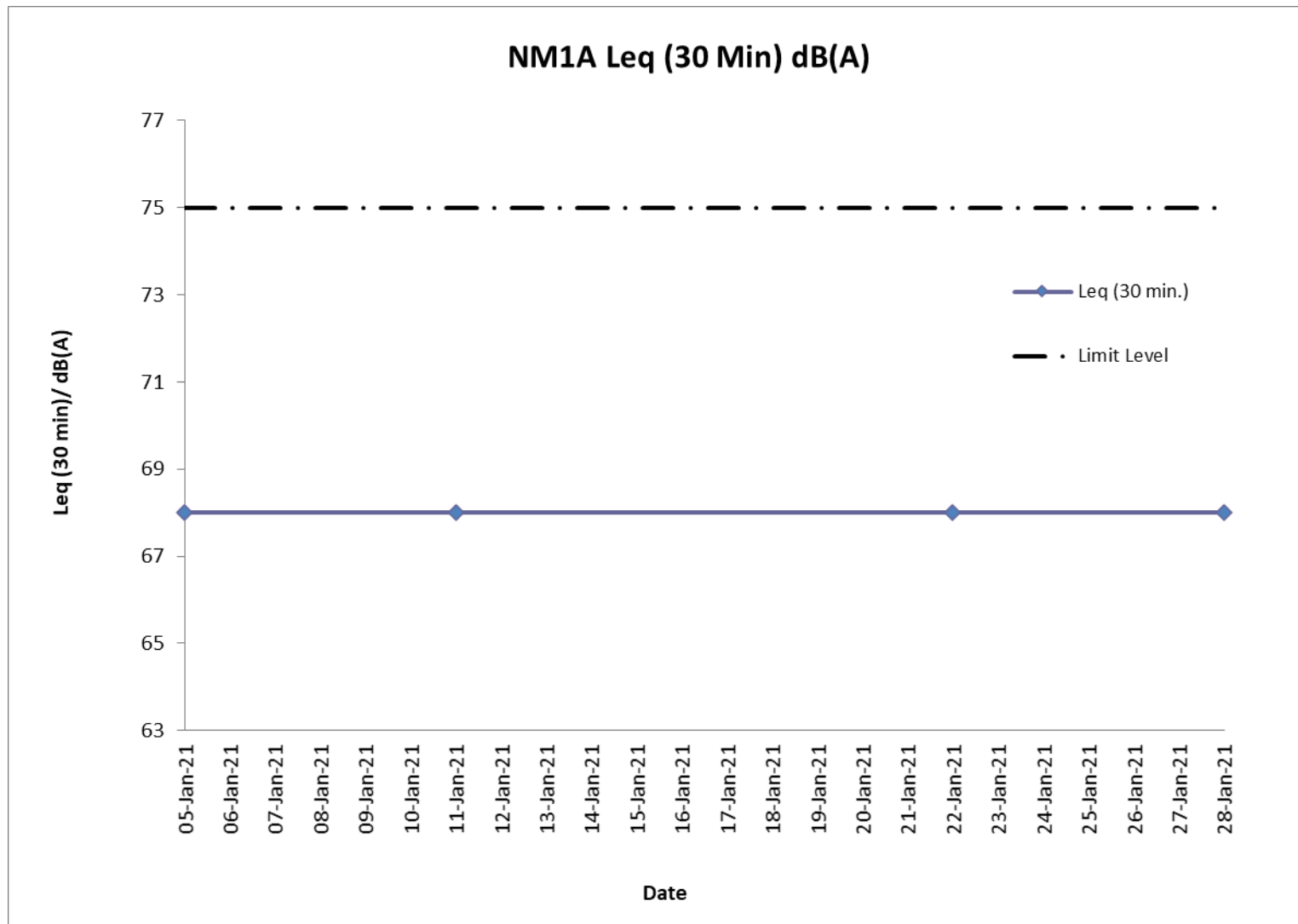
## **Remarks:**

\* +3dB (A) correction was applied to free-field measurement.



The station set-up of a free-field measurement at Station NM1A.

# Graphical Presentation Noise Monitoring Result at Station NM1A

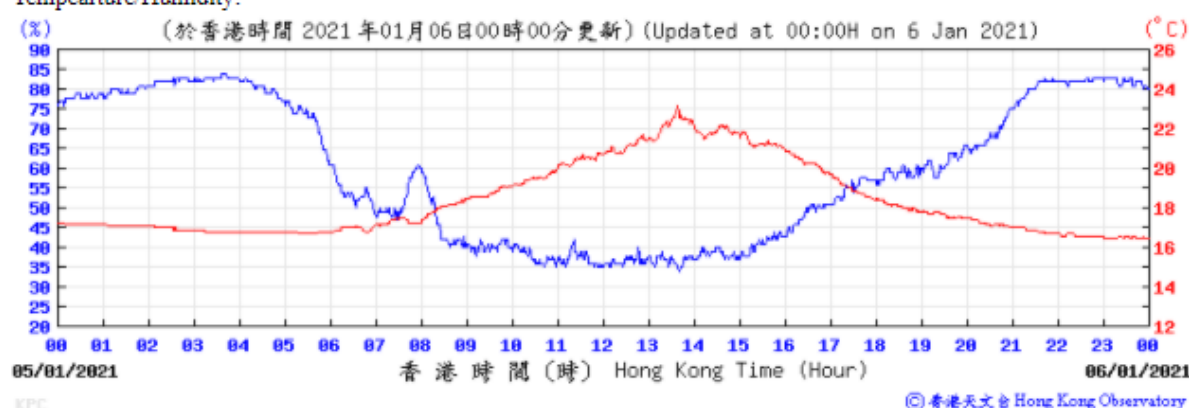


## **H. Meteorological Data Extracted from Hong Kong Observatory**



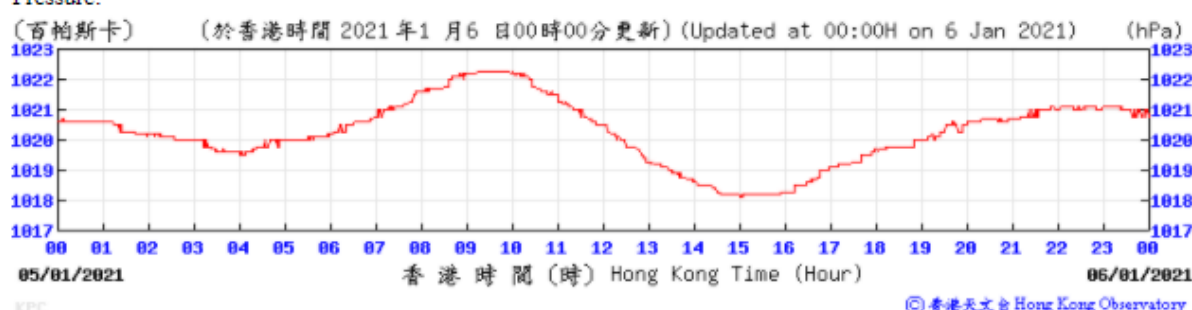
# Extract of Meteorological Observations for King's Park Automatic Weather Station, January 2021

Temperature/Humidity:



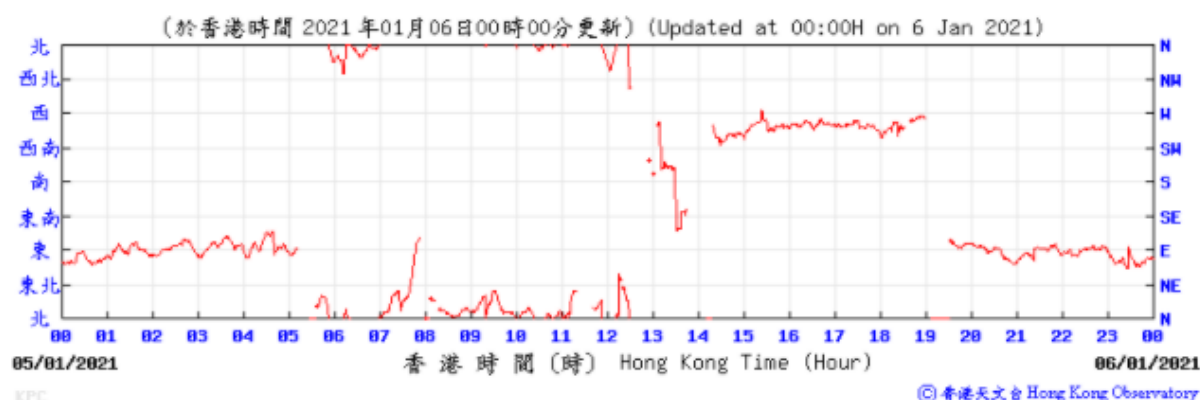
KPC

Pressure:



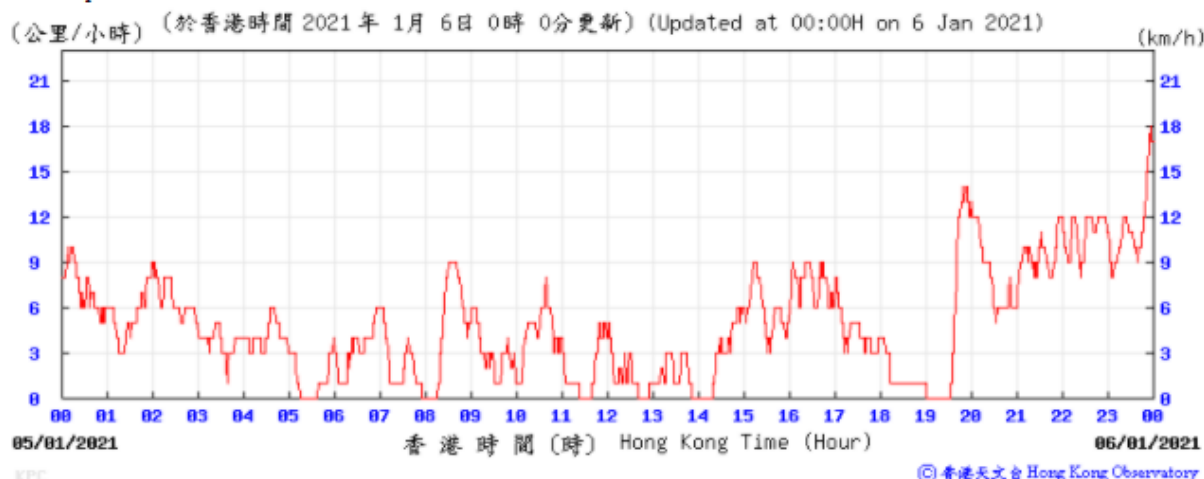
KPC

Wind Direction:



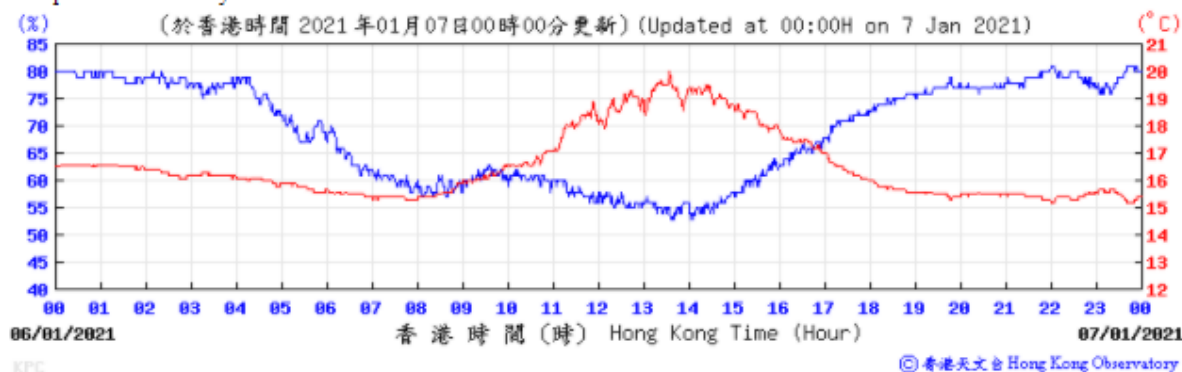
KPC

Wind Speed:

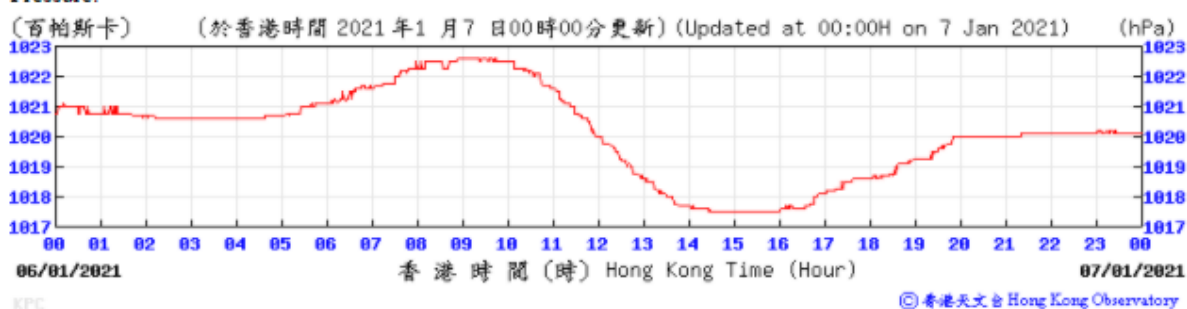


KPC

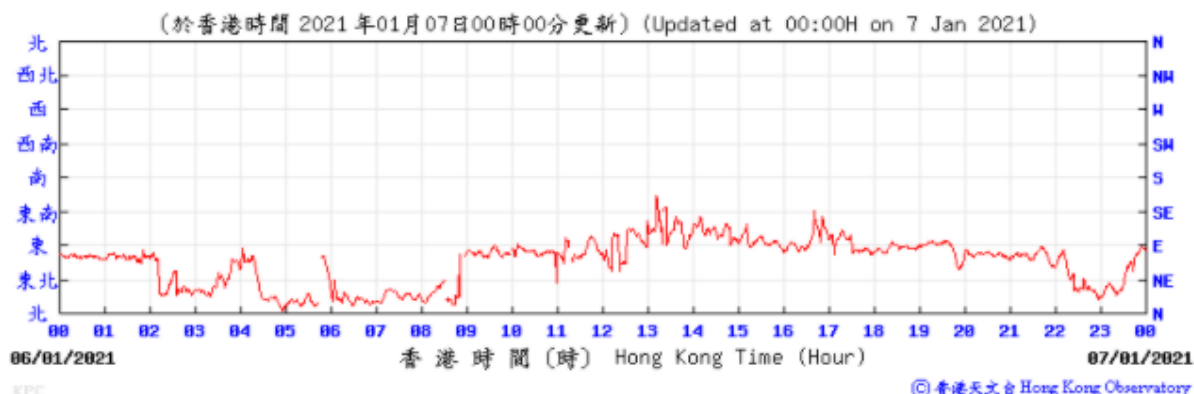
Temperature/Humidity:



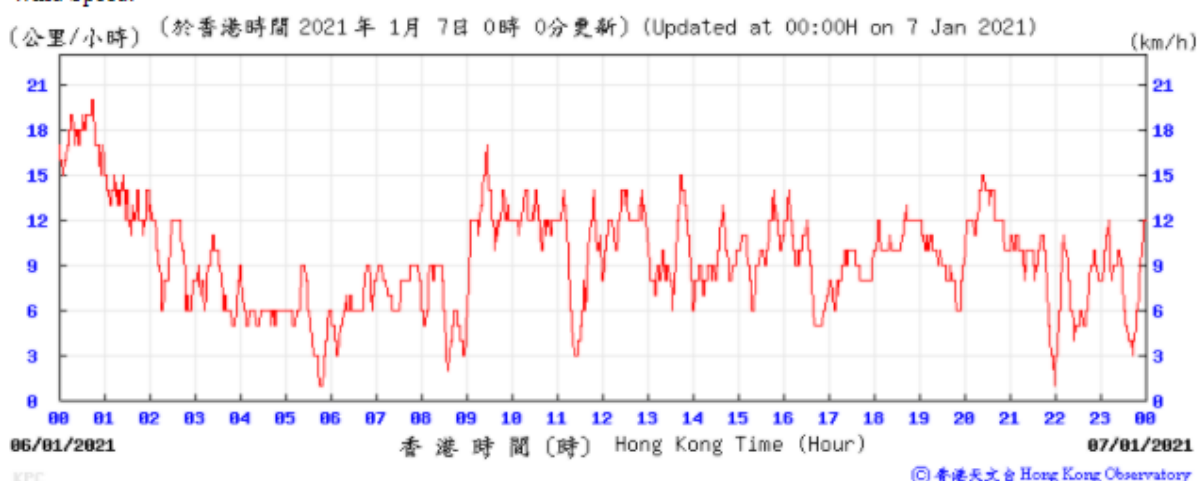
Pressure:



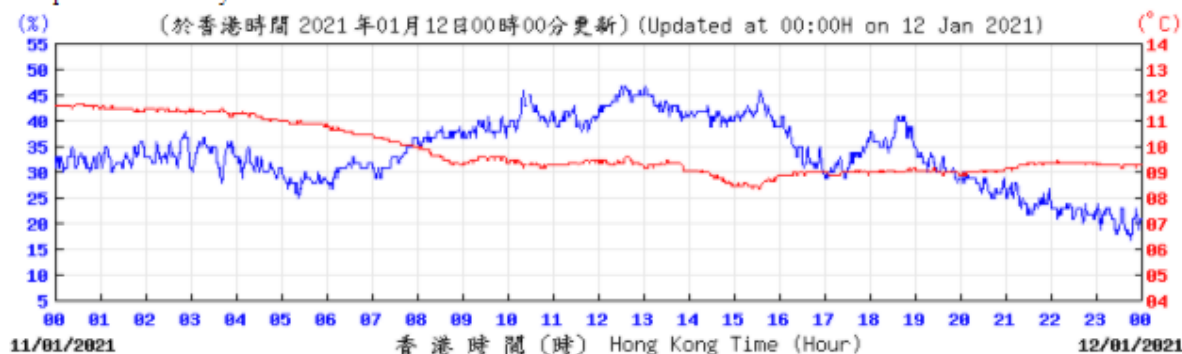
Wind Direction:



Wind Speed:

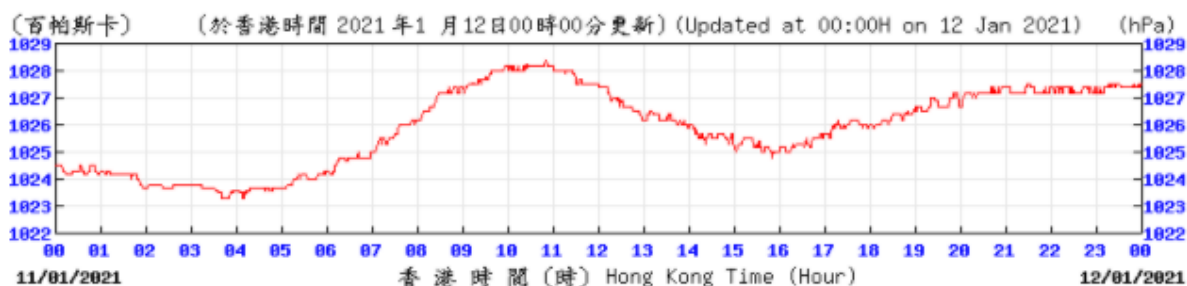


Temperature/Humidity:



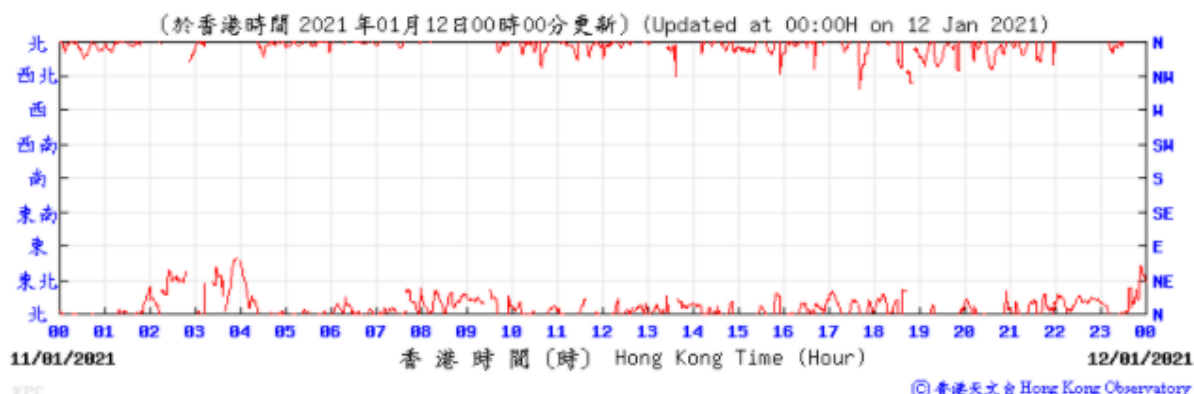
KPC

Pressure:



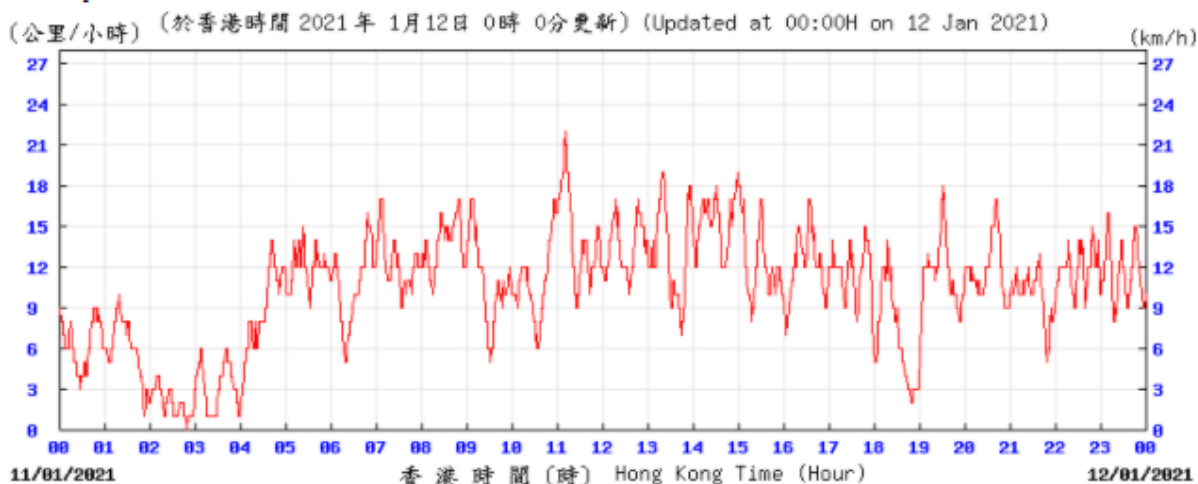
KPC

Wind Direction:



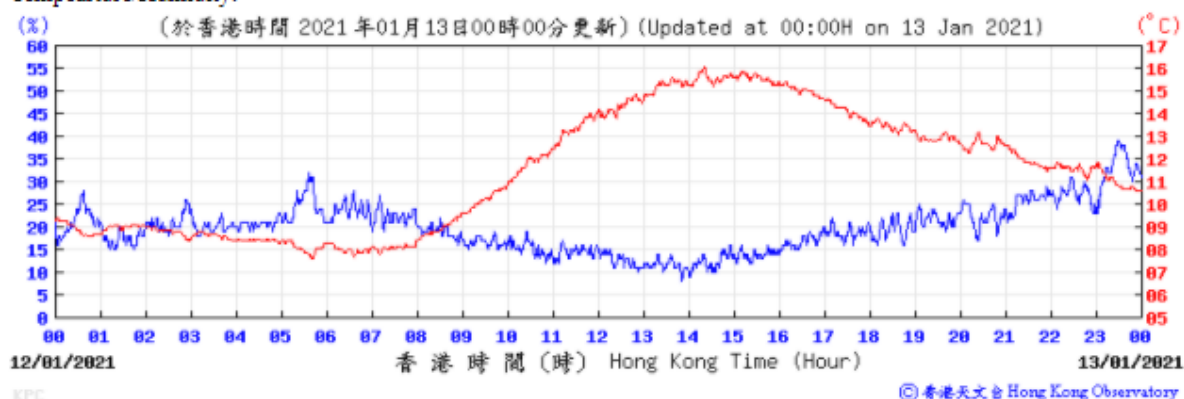
KPC

Wind Speed:

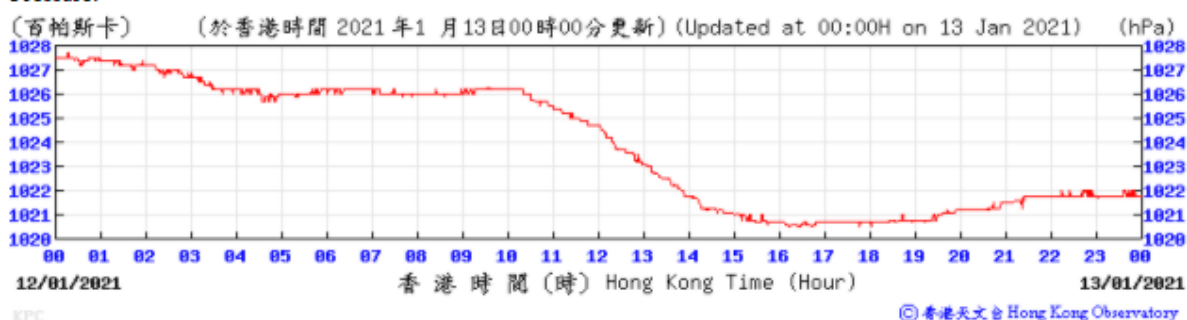


KPC

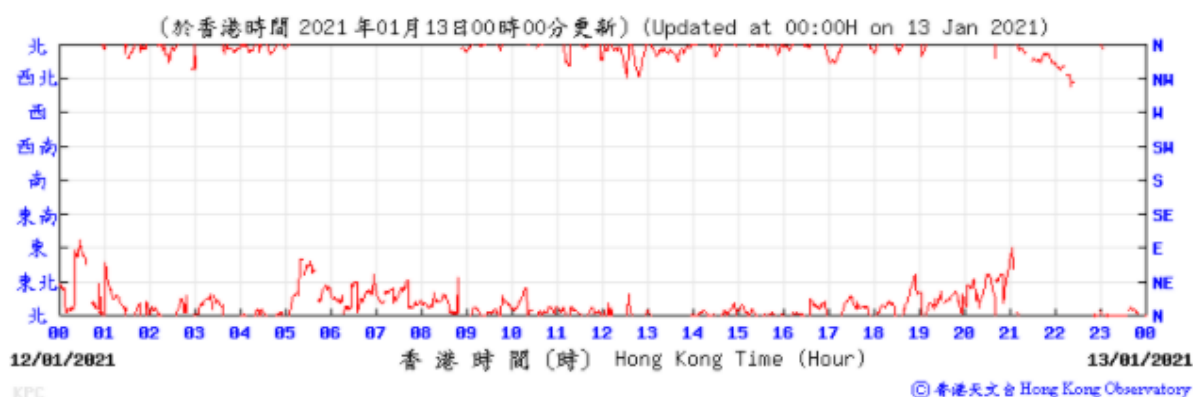
Temperature/Humidity:



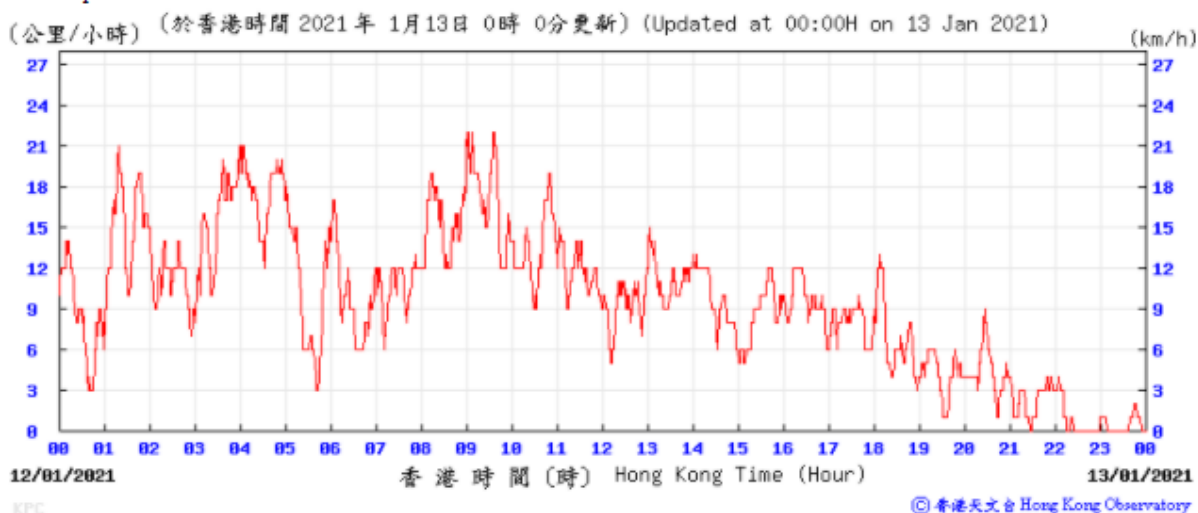
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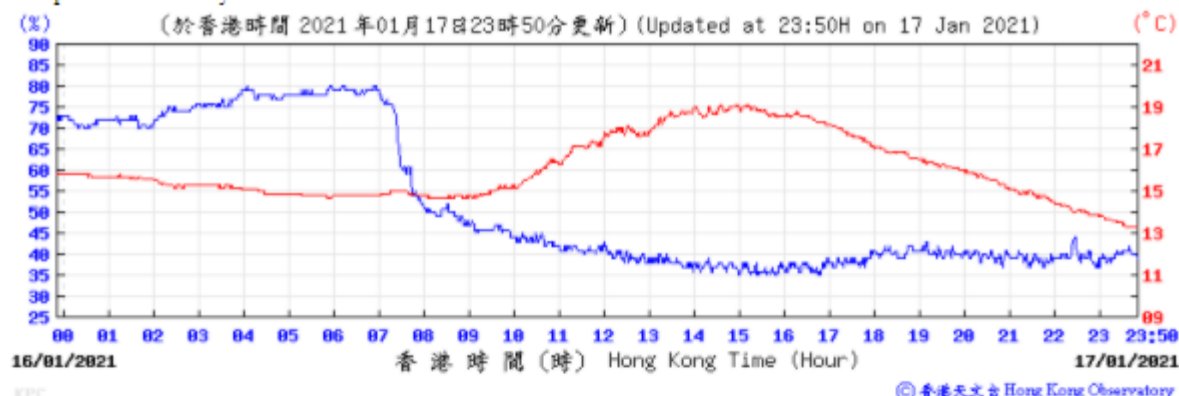
Wind Direction:



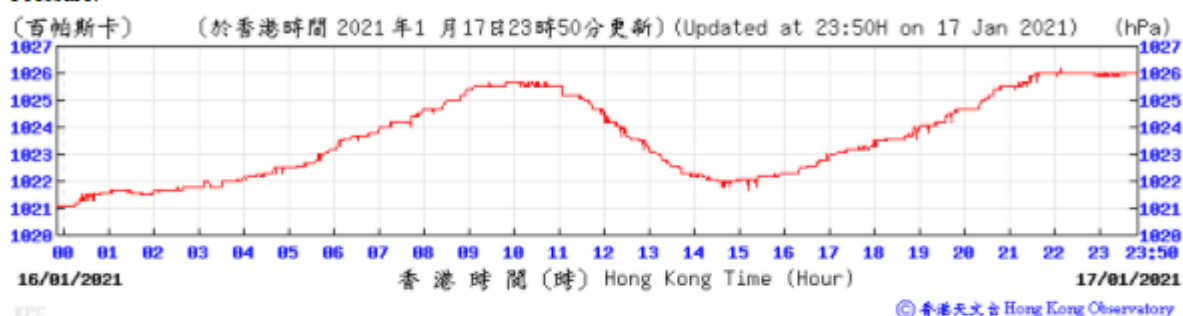
Wind Speed:



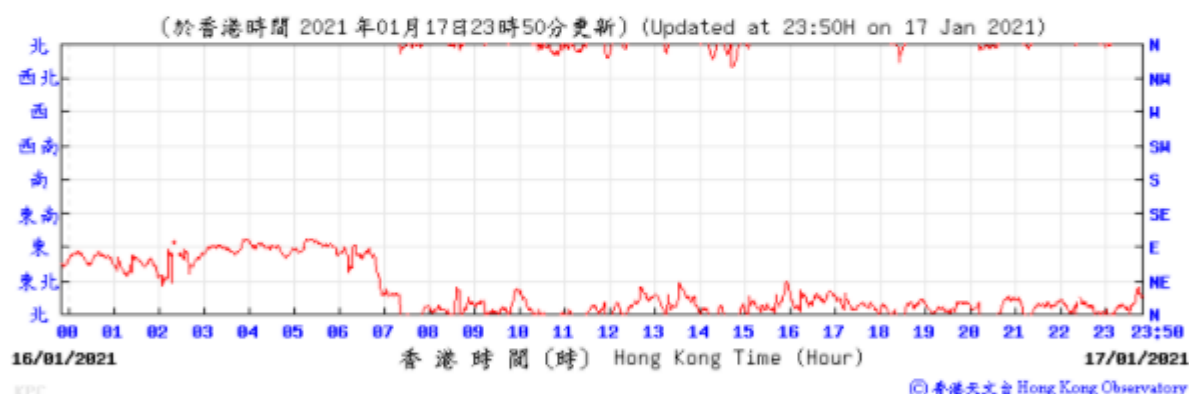
Temperature/Humidity:



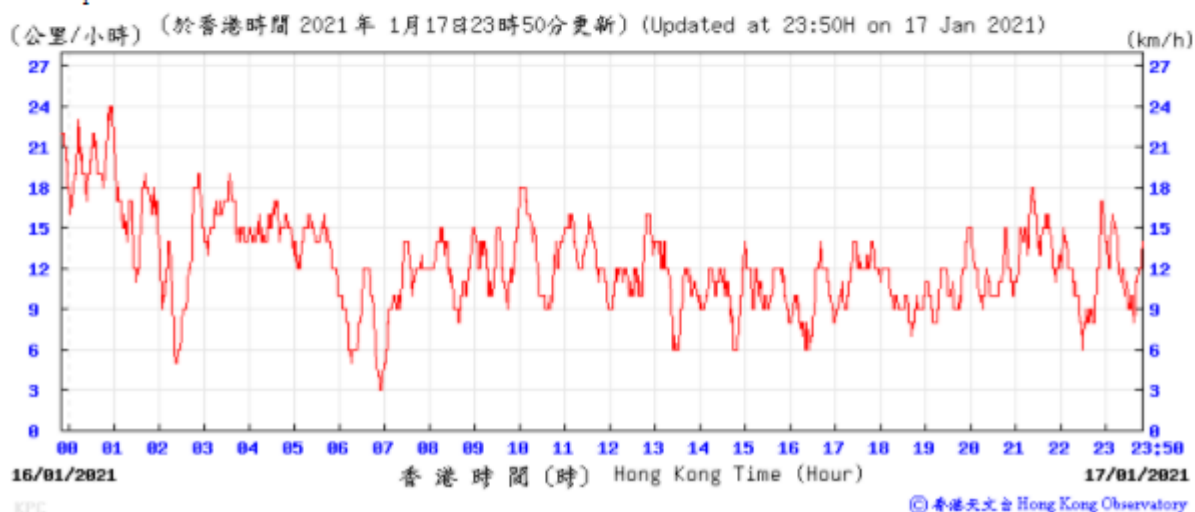
Pressure:



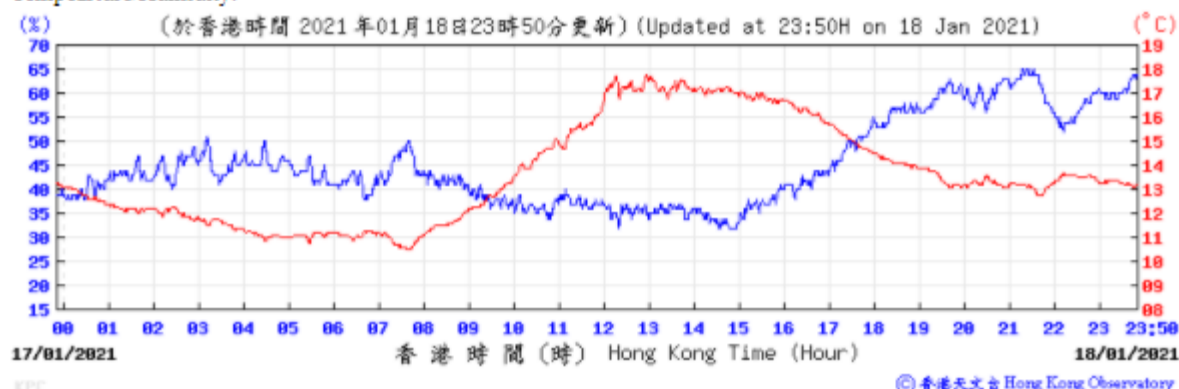
Wind Direction:



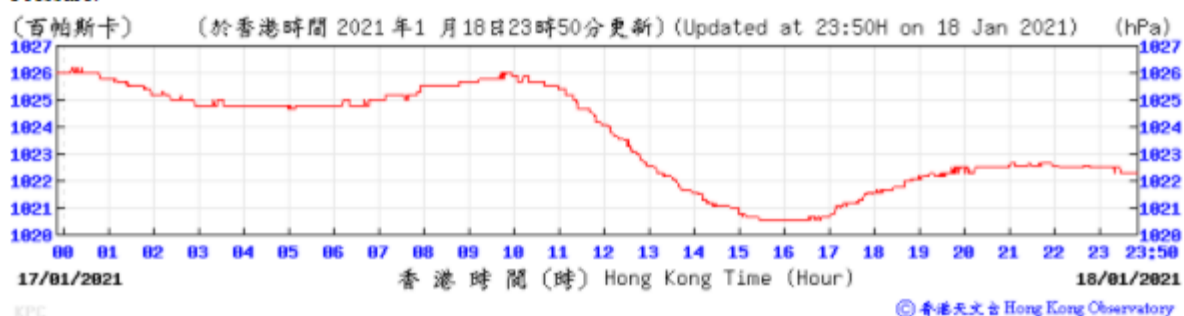
Wind Speed:



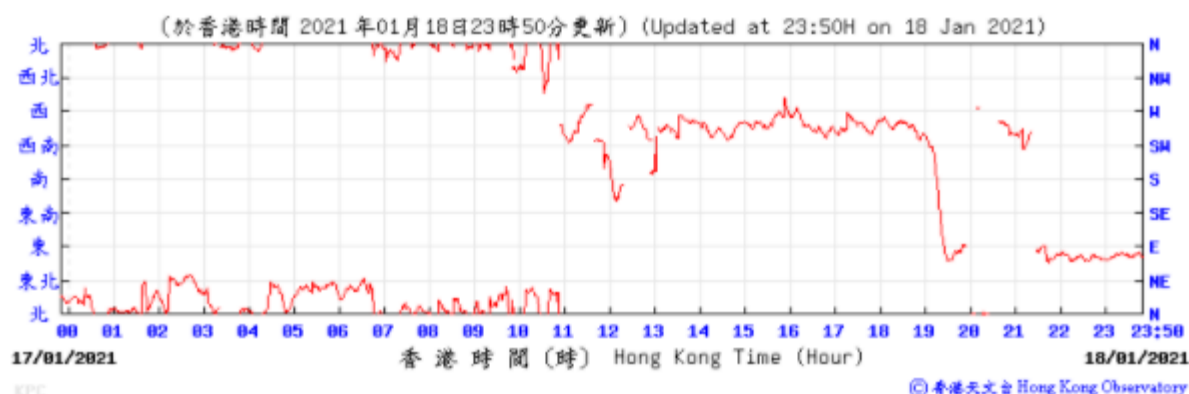
Temperature/Humidity:



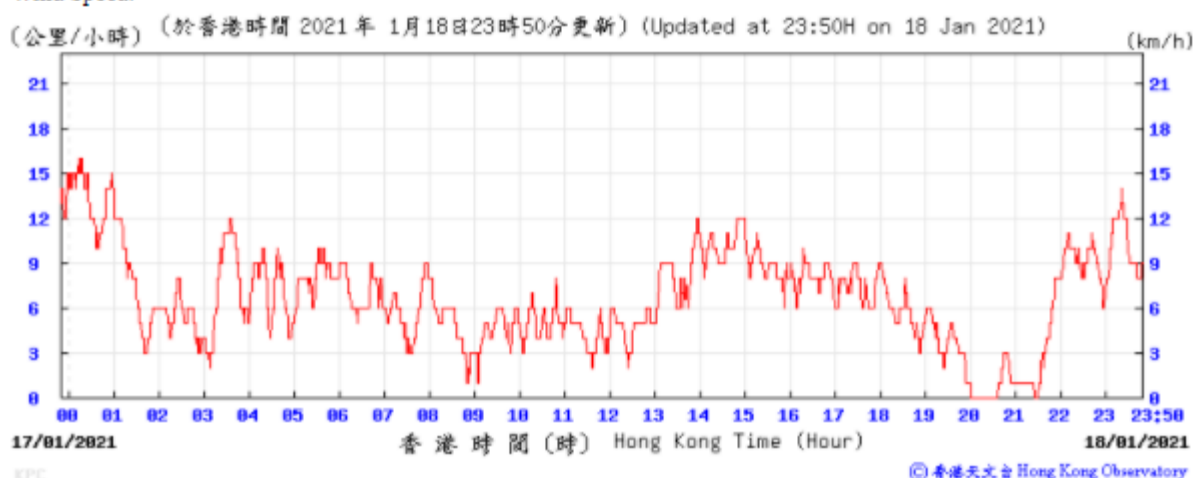
Pressure:



Wind Direction:

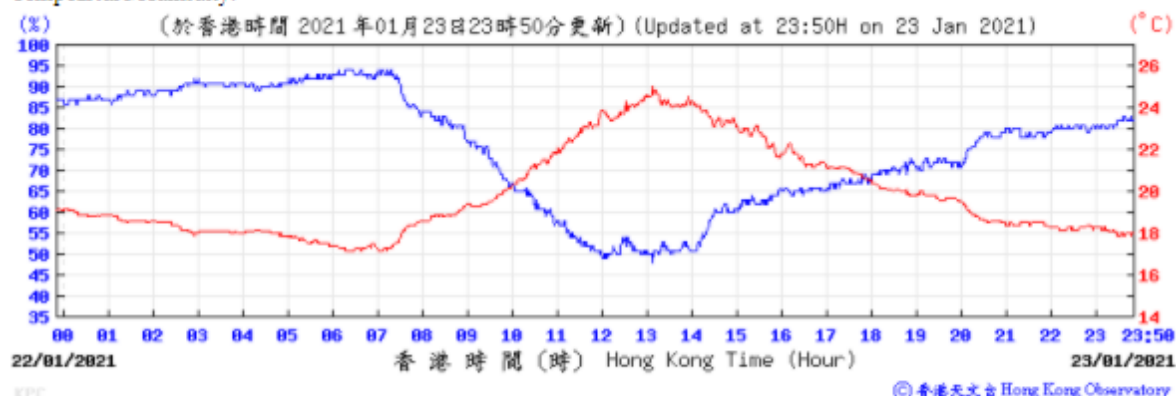


Wind Speed:

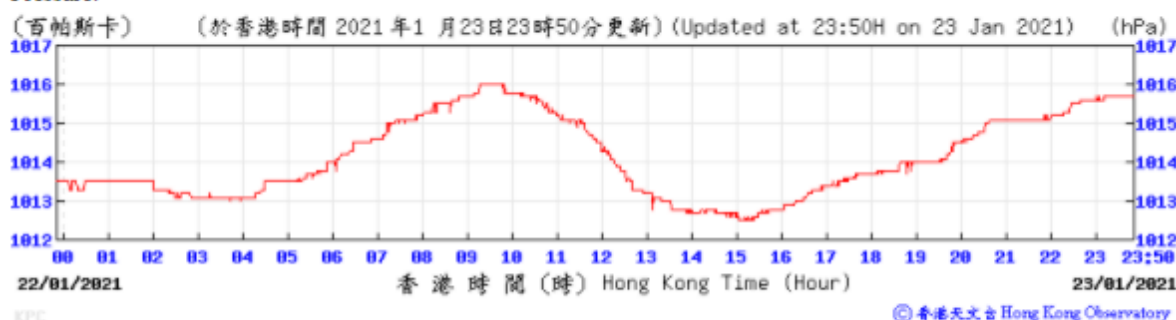




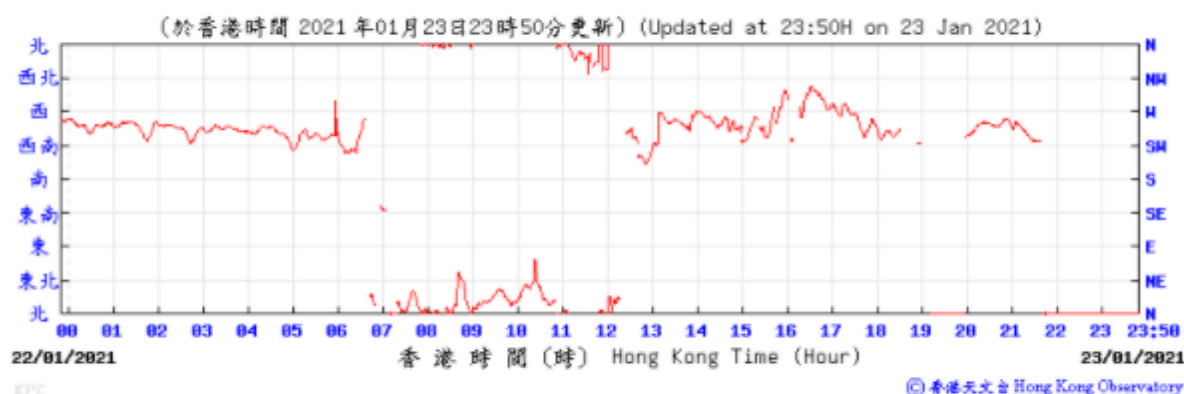
Temperature/Humidity:



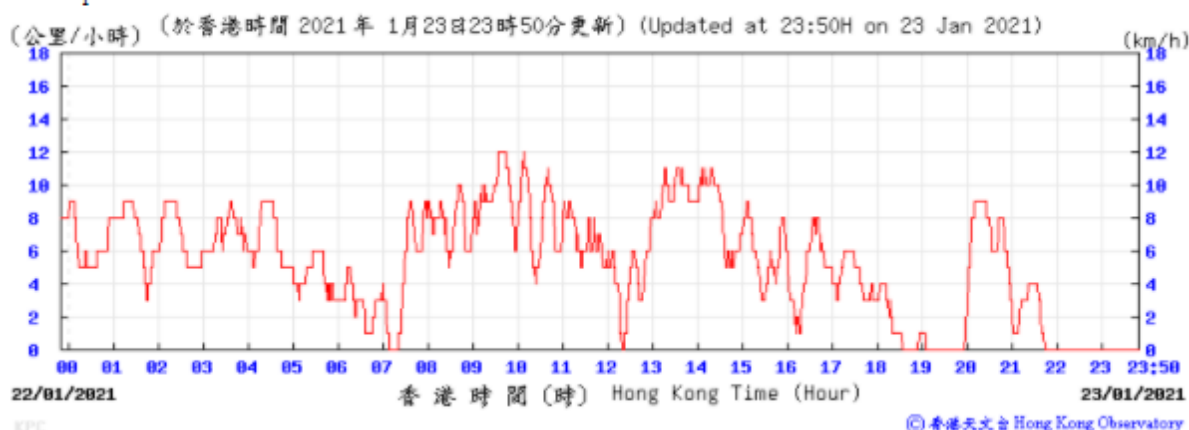
Pressure:



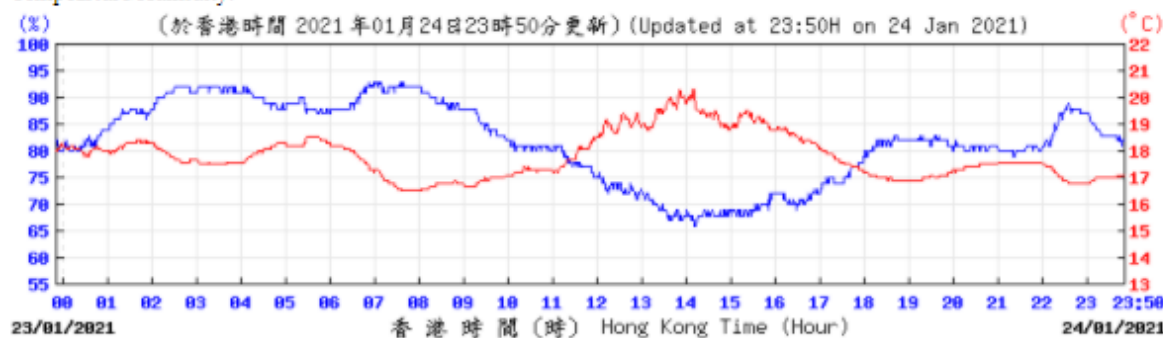
Wind Direction:



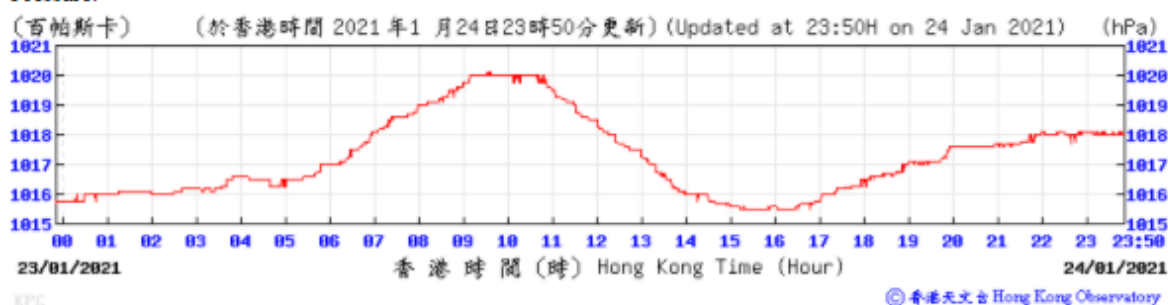
Wind Speed:



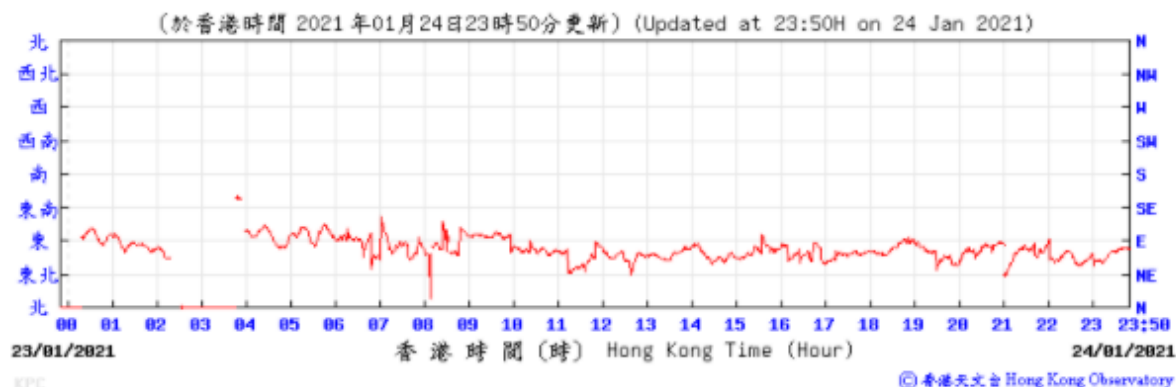
Temperature/Humidity:



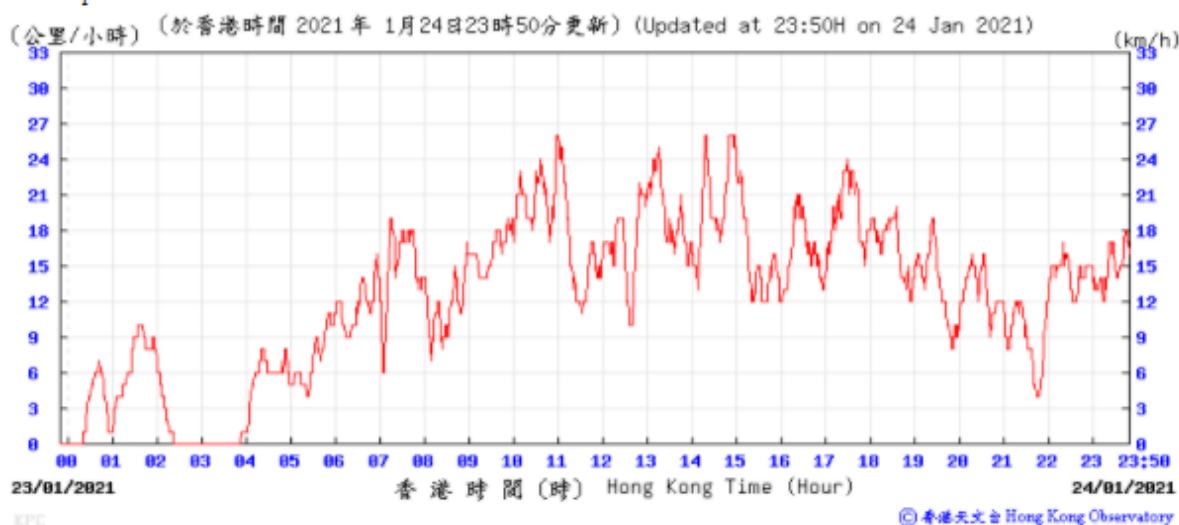
Pressure:



Wind Direction:

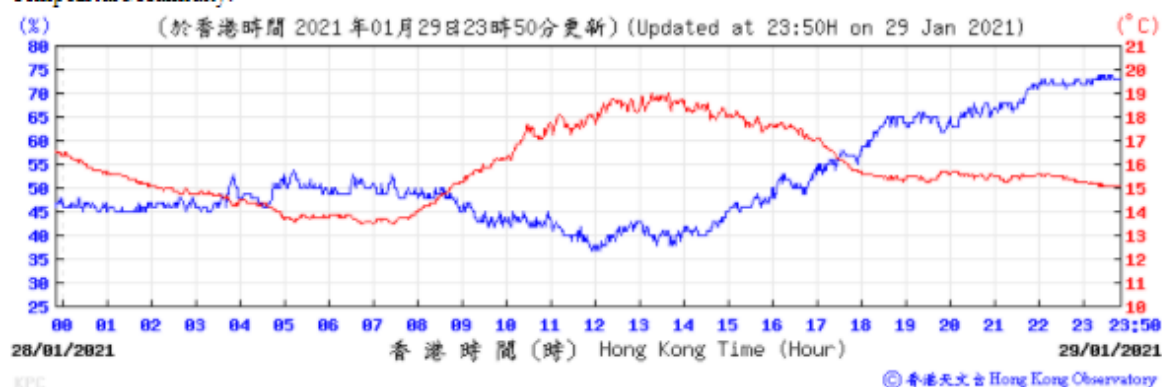


Wind Speed:

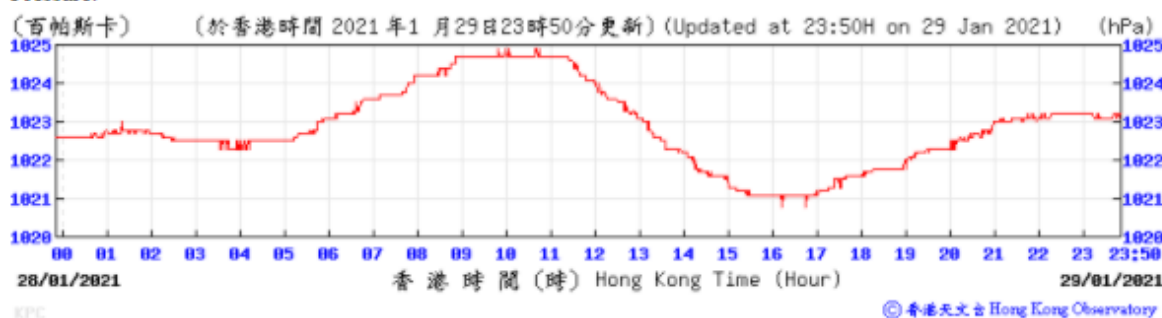




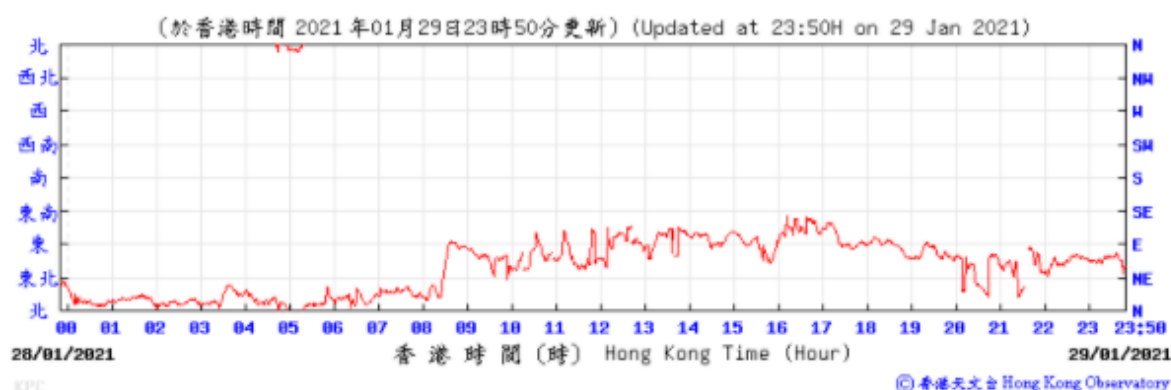
Temperature Humidity:



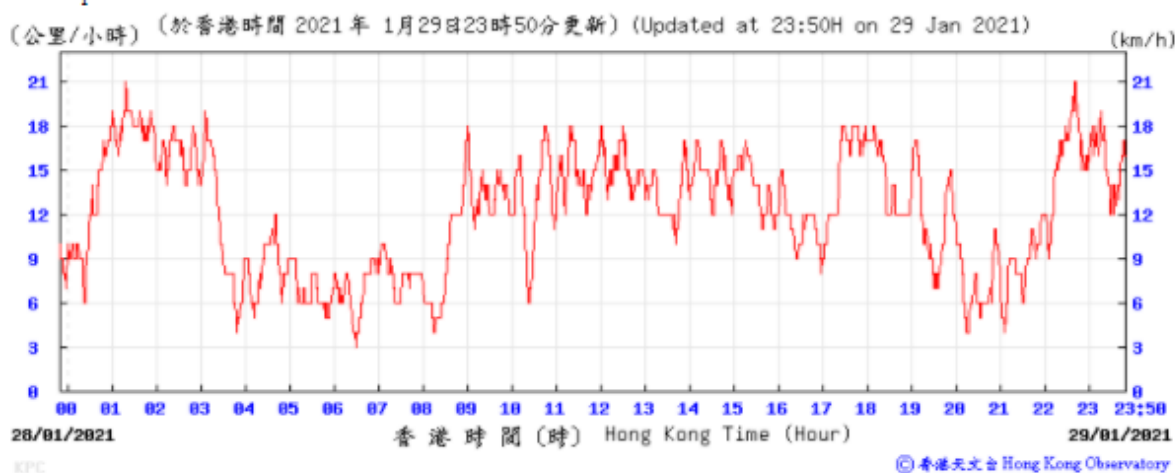
Pressure:



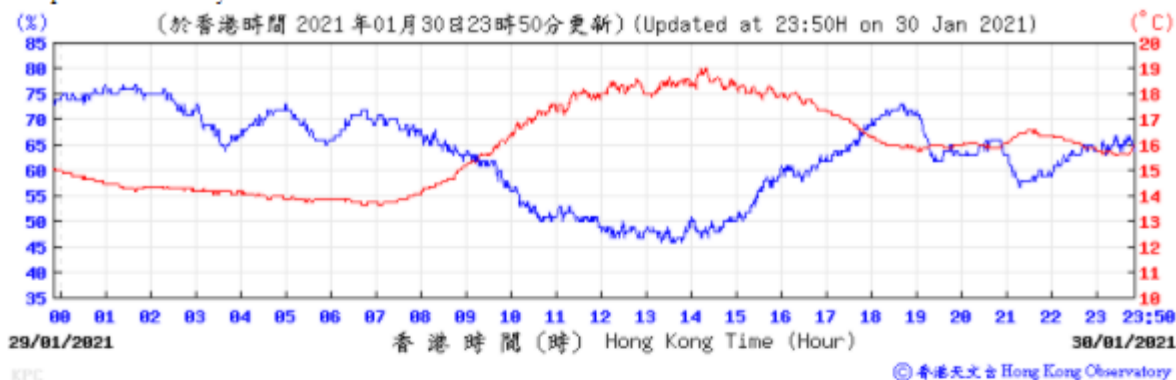
Wind Direction:



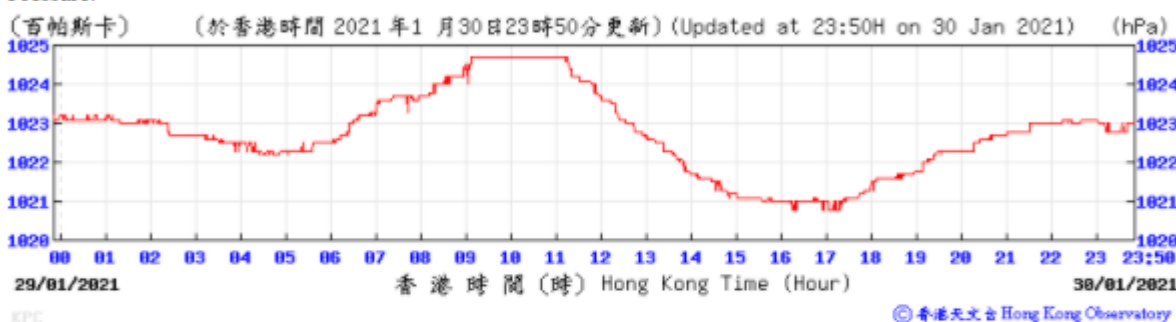
Wind Speed:



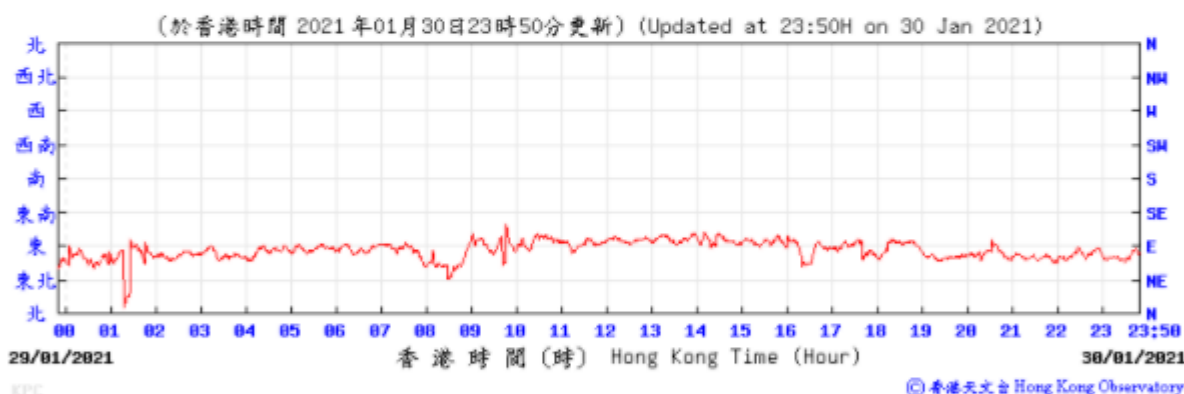
Temperature/Humidity:



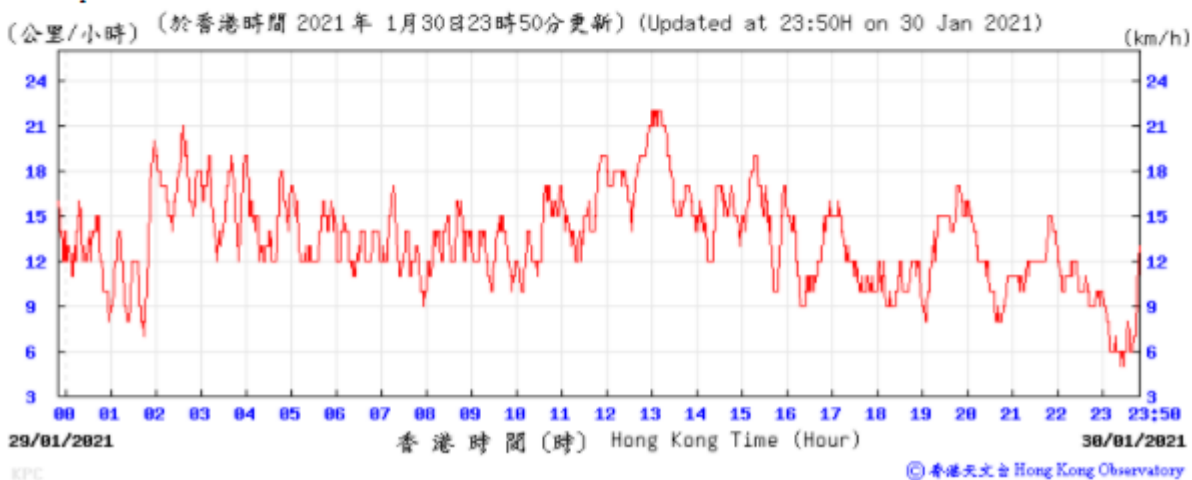
Pressure:



Wind Direction:



Wind Speed:



## **I. Waste Flow table**

# M+ Museum

**Table I-1: Monthly Waste Flow Table for M+ Museum**

| Month            | Actual Quantities of Inert C&D Materials Generated Monthly |                                      |                        |                          |                         |                              |               | Actual Quantities of C&D Wastes Generated Monthly |                            |             |              |                |                             |
|------------------|--|--------------------------------------|------------------------|--------------------------|-------------------------|------------------------------|---------------|---|----------------------------|-------------|--------------|----------------|-----------------------------|
|                  | Total Quantity Generated                                   | Hard Rocks and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Disposed to Sorting Facility | Imported Fill | Metals  | Paper/ Cardboard Packaging | Plastics    | Wood/ Timber | Chemical Waste | Others, e.g. General Refuse |
|                  | (in tonnes)  | (in tonnes)                          | (in tonnes)            | (in tonnes)              | (in tonnes)             | (in tonnes)                  | (in tonnes)   | (in tonnes)                                       | (in tonnes)                | (in tonnes) | (in tonnes)  | (in tonnes)    | (in tonnes)                 |
| <b>2015</b>      |  |                                      |                        |                          |                         |                              |               |   |                            |             |              |                |                             |
| Nov              | 46607.4  | 0.0                                  | 0.0                    | 8240.0                   | 38367.4                 | 0.0                          | 0.0           | 76.2  | 0.0                        | 0.0         | 0.0          | 0.0            | 67.6                        |
| Dec              | 29652.9  | 0.0                                  | 0.0                    | 29621.4                  | 31.5                    | 0.0                          | 0.0           | 26.3  | 0.0                        | 0.0         | 0.0          | 1.0            | 66.0                        |
| Sub-total (2015) | 76260.3  | 0.0                                  | 0.0                    | 37861.4                  | 38398.9                 | 0.0                          | 0.0           | 102.5   | 0.0                        | 0.0         | 0.0          | 1.0            | 133.6                       |
| <b>2016</b>      |  |                                      |                        |                          |                         |                              |               |   |                            |             |              |                |                             |
| Jan              | 21077.4  | 0.0                                  | 6352.0                 | 14576.0                  | 149.4                   | 0.0                          | 0.0           | 18.8  | 0.0                        | 0.0         | 0.0          | 0.0            | 23.2                        |
| Feb              | 7626.2   | 0.0                                  | 3424.0                 | 4048.0                   | 154.2                   | 0.0                          | 0.0           | 59.8  | 0.0                        | 0.0         | 0.0          | 0.0            | 20.5                        |
| Mar              | 10442.5  | 0.0                                  | 1600.0                 | 7888.0                   | 954.5                   | 0.0                          | 0.0           | 29.7  | 0.0                        | 0.0         | 0.0          | 0.0            | 46.3                        |
| Apr              | 30413.2  | 0.0                                  | 6352.0                 | 23408.0                  | 653.2                   | 0.0                          | 0.0           | 25.8  | 0.1                        | 0.0         | 27.8         | 0.0            | 34.5                        |
| May              | 24083.5  | 0.0                                  | 112.0                  | 23216.0                  | 755.5                   | 0.0                          | 0.0           | 61.5  | 0.4                        | 0.0         | 33.6         | 0.0            | 62.3                        |
| Jun              | 7880.1   | 0.0                                  | 4736.0                 | 2384.0                   | 760.1                   | 0.0                          | 0.0           | 106.6   | 0.1                        | 0.0         | 14.6         | 0.0            | 52.8                        |
| Jul              | 5893.1   | 0.0                                  | 2656.0                 | 2240.0                   | 997.1                   | 0.0                          | 0.0           | 77.6  | 0.0                        | 0.0         | 33.6         | 0.0            | 83.1                        |
| Aug              | 13709.6  | 0.0                                  | 0.0                    | 12432.0                  | 1277.6                  | 0.0                          | 0.0           | 111.3   | 0.2                        | 0.0         | 38.5         | 0.0            | 104.9                       |
| Sep              | 6702.0   | 0.0                                  | 0.0                    | 5648.0                   | 1000.1                  | 53.9                         | 0.0           | 104.2   | 0.0                        | 0.0         | 45.5         | 0.2            | 107.9                       |
| Oct              | 2103.6   | 0.0                                  | 0.0                    | 496.0                    | 1595.4                  | 12.2                         | 0.0           | 83.0  | 0.4                        | 0.0         | 73.5         | 0.0            | 108.2                       |
| Nov              | 3302.7   | 0.0                                  | 0.0                    | 2384.0                   | 855.5                   | 63.2                         | 0.0           | 88.4  | 0.6                        | 0.0         | 63.0         | 0.0            | 129.1                       |
| Dec              | 899.8  | 0.0                                  | 0.0                    | 736.0                    | 126.8                   | 37.0                         | 0.0           | 48.3  | 0.6                        | 0.0         | 70.0         | 0.0            | 89.0                        |
| Sub-total (2016) | 134133.5   | 0.0                                  | 25232.0                | 99456.0                  | 9279.3                  | 166.3                        | 0.0           | 814.9   | 2.3                        | 0.0         | 400.1        | 0.2            | 861.8                       |
| <b>2017</b>      |  |                                      |                        |                          |                         |                              |               |   |                            |             |              |                |                             |
| Jan              | 675.2  | 0.0                                  | 0.0                    | 432.0                    | 237.9                   | 5.3                          | 0.0           | 79.5  | 1.0                        | 0.0         | 70.0         | 0.0            | 79.7                        |
| Feb              | 927.7  | 0.0                                  | 0.0                    | 768.0                    | 125.6                   | 34.0                         | 0.0           | 70.5  | 0.6                        | 0.0         | 84.0         | 0.0            | 81.4                        |
| Mar              | 1856.7   | 0.0                                  | 0.0                    | 1280.0                   | 466.9                   | 109.8                        | 0.0           | 62.8  | 0.4                        | 0.0         | 98.0         | 0.0            | 148.5                       |
| Apr              | 642.4  | 0.0                                  | 0.0                    | 160.0                    | 324.9                   | 157.5                        | 0.0           | 87.5  | 0.7                        | 0.0         | 175.0        | 0.0            | 102.5                       |
| May              | 1118.2   | 0.0                                  | 0.0                    | 528.0                    | 416.4                   | 173.7                        | 0.0           | 118.3   | 0.0                        | 0.0         | 280.0        | 0.0            | 139.0                       |
| Jun              | 650.0  | 0.0                                  | 0.0                    | 0.0                      | 451.6                   | 198.4                        | 0.0           | 199.7   | 1.4                        | 0.0         | 350.0        | 0.0            | 98.7                        |
| Jul              | 1762.0   | 0.0                                  | 0.0                    | 0.0                      | 1466.6                  | 295.4                        | 0.0           | 36.9  | 1.2                        | 0.0         | 244.0        | 0.0            | 164.2                       |
| Aug              | 1231.5   | 0.0                                  | 0.0                    | 0.0                      | 867.5                   | 364.0                        | 0.0           | 82.5  | 0.9                        | 0.0         | 59.0         | 0.0            | 186.9                       |
| Sep              | 1681.7   | 0.0                                  | 0.0                    | 0.0                      | 1342.0                  | 339.7                        | 0.0           | 114.3   | 0.7                        | 0.0         | 77.0         | 0.0            | 265.3                       |
| Oct              | 483.6  | 0.0                                  | 0.0                    | 0.0                      | 242.5                   | 241.1                        | 0.0           | 458.1   | 0.6                        | 0.0         | 24.1         | 0.0            | 128.5                       |
| Nov              | 822.8  | 0.0                                  | 0.0                    | 0.0                      | 344.5                   | 478.3                        | 0.0           | 1168.9  | 0.7                        | 0.0         | 140.0        | 0.2            | 219.1                       |
| Dec              | 601.3  | 0.0                                  | 0.0                    | 0.0                      | 236.2                   | 365.1                        | 0.0           | 995.8   | 0.8                        | 0.0         | 320.0        | 0.0            | 241.9                       |
| Sub-total (2017) | 12453.0  | 0.0                                  | 0.0                    | 3168.0                   | 6522.6                  | 2762.4                       | 0.0           | 3474.8  | 8.9                        | 0.0         | 1921.1       | 0.2            | 1855.5                      |

**Table I-1: Monthly Waste Flow Table for M+ Museum**

| Month            | Actual Quantities of Inert C&D Materials Generated Monthly |                                      |                        |                          |                         |                              |               | Actual Quantities of C&D Wastes Generated Monthly |                            |             |              |                |                             |
|------------------|--|--------------------------------------|------------------------|--------------------------|-------------------------|------------------------------|---------------|---|----------------------------|-------------|--------------|----------------|-----------------------------|
|                  | Total Quantity Generated                                   | Hard Rocks and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Disposed to Sorting Facility | Imported Fill | Metals  | Paper/ Cardboard Packaging | Plastics    | Wood/ Timber | Chemical Waste | Others, e.g. General Refuse |
|                  | (in tonnes)  | (in tonnes)                          | (in tonnes)            | (in tonnes)              | (in tonnes)             | (in tonnes)                  | (in tonnes)   | (in tonnes)                                       | (in tonnes)                | (in tonnes) | (in tonnes)  | (in tonnes)    | (in tonnes)                 |
| <b>2018</b>      |  |                                      |                        |                          |                         |                              |               |   |                            |             |              |                |                             |
| Jan              | 1015.3   | 0.0                                  | 0.0                    | 0.0                      | 574.1                   | 441.2                        | 0.0           | 634.6   | 1.5                        | 0.0         | 100.0        | 0.0            | 183.6                       |
| Feb              | 847.6  | 0.0                                  | 0.0                    | 0.0                      | 608.3                   | 239.3                        | 0.0           | 14.2  | 1.0                        | 0.0         | 25.0         | 0.0            | 154.9                       |
| Mar              | 1507.0   | 0.0                                  | 0.0                    | 0.0                      | 1102.1                  | 404.9                        | 0.0           | 647.5   | 1.5                        | 0.0         | 120.0        | 0.0            | 264.1                       |
| Apr              | 2942.8   | 0.0                                  | 0.0                    | 0.0                      | 2542.4                  | 400.4                        | 0.0           | 253.4   | 0.3                        | 0.0         | 100.0        | 0.0            | 252.5                       |
| May              | 2109.2   | 0.0                                  | 0.0                    | 0.0                      | 1593.3                  | 515.9                        | 0.0           | 179.4   | 0.4                        | 0.0         | 70.0         | 0.0            | 311.4                       |
| Jun              | 1697.6   | 0.0                                  | 0.0                    | 0.0                      | 1162.4                  | 535.2                        | 0.0           | 81.3  | 0.3                        | 0.0         | 105.0        | 0.0            | 188.2                       |
| Jul              | 945.5  | 0.0                                  | 0.0                    | 0.0                      | 646.1                   | 299.4                        | 0.0           | 47.6  | 0.4                        | 0.0         | 150.0        | 0.0            | 277.6                       |
| Aug              | 730.8  | 0.0                                  | 0.0                    | 0.0                      | 461.4                   | 269.4                        | 0.0           | 29.3  | 0.0                        | 0.0         | 40.0         | 0.0            | 109.1                       |
| Sep              | 0.0  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 0.0                         |
| Oct              | 1193.1   | 0.0                                  | 0.0                    | 0.0                      | 895.7                   | 297.5                        | 0.0           | 130.8   | 2.7                        | 0.0         | 200.0        | 0.0            | 116.6                       |
| Nov              | 1608.9   | 0.0                                  | 0.0                    | 0.0                      | 841.1                   | 767.7                        | 0.0           | 139.9   | 1.1                        | 0.0         | 245.0        | 0.0            | 213.9                       |
| Dec              | 1457.8   | 0.0                                  | 0.0                    | 314.4                    | 341.9                   | 801.5                        | 0.0           | 352.7   | 0.8                        | 0.0         | 180.0        | 0.0            | 198.2                       |
| Sub-total (2018) | 16055.4  | 0.0                                  | 0.0                    | 314.4                    | 10768.7                 | 4972.3                       | 0.0           | 2510.6  | 9.9                        | 0.0         | 1335.0       | 0.0            | 2270.2                      |
| <b>2019</b>      |  |                                      |                        |                          |                         |                              |               |   |                            |             |              |                |                             |
| Jan              | 1632.5   | 0.0                                  | 0.0                    | 153.6                    | 572.3                   | 906.6                        | 0.0           | 587.8   | 0.8                        | 0.0         | 40.0         | 0.0            | 303.9                       |
| Feb              | 618.5  | 0.0                                  | 0.0                    | 0.0                      | 397.4                   | 221.2                        | 0.0           | 158.3   | 1.2                        | 0.0         | 20.0         | 0.0            | 429.7                       |
| Mar              | 1555.1   | 0.0                                  | 0.0                    | 441.6                    | 920.2                   | 193.2                        | 0.0           | 371.3   | 0.0                        | 0.0         | 20.0         | 0.0            | 645.2                       |
| Apr              | 327.4  | 0.0                                  | 0.0                    | 0.0                      | 127.3                   | 200.2                        | 0.0           | 291.4   | 1.3                        | 0.0         | 300.0        | 0.9            | 477.4                       |
| May              | 712.8  | 0.0                                  | 0.0                    | 361.9                    | 116.7                   | 234.3                        | 0.0           | 197.4   | 0.8                        | 0.0         | 320.0        | 0.0            | 531.1                       |
| Jun              | 219.9  | 0.0                                  | 0.0                    | 0.0                      | 95.6                    | 124.4                        | 0.0           | 199.6   | 0.5                        | 0.0         | 350.0        | 0.0            | 448.0                       |
| Jul              | 445.8  | 0.0                                  | 0.0                    | 0.0                      | 171.6                   | 274.1                        | 0.0           | 137.7   | 1.1                        | 0.0         | 300.0        | 0.6            | 553.1                       |
| Aug              | 692.6  | 0.0                                  | 0.0                    | 55.2                     | 354.1                   | 283.3                        | 0.0           | 139.1   | 0.0                        | 0.0         | 0.0          | 0.0            | 596.8                       |
| Sep              | 549.4  | 0.0                                  | 0.0                    | 72.0                     | 218.2                   | 259.2                        | 0.0           | 374.9   | 0.0                        | 0.0         | 420.0        | 0.0            | 560.5                       |
| Oct              | 373.0  | 0.0                                  | 0.0                    | 0.0                      | 204.4                   | 168.6                        | 0.0           | 161.9   | 0.0                        | 1.2         | 450.0        | 0.4            | 657.7                       |
| Nov              | 681.1  | 0.0                                  | 0.0                    | 192.0                    | 263.0                   | 226.1                        | 0.0           | 143.9   | 0.7                        | 0.9         | 380.0        | 0.0            | 659.8                       |
| Dec              | 727.5  | 0.0                                  | 0.0                    | 240.0                    | 341.0                   | 146.5                        | 0.0           | 476.1   | 0.8                        | 0.7         | 345.0        | 0.0            | 682.3                       |
| Sub-total (2019) | 8535.5   | 0.0                                  | 0.0                    | 1516.3                   | 3781.6                  | 3237.7                       | 0.0           | 3239.3  | 7.1                        | 2.8         | 2945.0       | 1.9            | 6545.5                      |

**Table I-1: Monthly Waste Flow Table for M+ Museum**

| Month            | Actual Quantities of Inert C&D Materials Generated Monthly |                                      |                        |                          |                         |                              |               | Actual Quantities of C&D Wastes Generated Monthly |                            |             |               |                |                             |
|------------------|--|--------------------------------------|------------------------|--------------------------|-------------------------|------------------------------|---------------|---|----------------------------|-------------|---------------|----------------|-----------------------------|
|                  | Total Quantity Generated                                   | Hard Rocks and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Disposed to Sorting Facility | Imported Fill | Metals  | Paper/ Cardboard Packaging | Plastics    | Wood/ Timber  | Chemical Waste | Others, e.g. General Refuse |
|                  | (in tonnes)  | (in tonnes)                          | (in tonnes)            | (in tonnes)              | (in tonnes)             | (in tonnes)                  | (in tonnes)   | (in tonnes)                                       | (in tonnes)                | (in tonnes) | (in tonnes)   | (in tonnes)    | (in tonnes)                 |
| <b>2020</b>      |  |                                      |                        |                          |                         |                              |               |   |                            |             |               |                |                             |
| Jan              | 404.3  | 0.0                                  | 0.0                    | 0.0                      | 351.1                   | 53.2                         | 0.0           | 224.2   | 0.8                        | 0.0         | 335.0         | 0.0            | 523.7                       |
| Feb              | 699.4  | 0.0                                  | 0.0                    | 144.0                    | 511.3                   | 44.1                         | 0.0           | 61.0  | 1.7                        | 1.6         | 280.0         | 0.0            | 333.2                       |
| Mar              | 613.8  | 0.0                                  | 0.0                    | 144.0                    | 459.4                   | 10.4                         | 0.0           | 165.5   | 0.6                        | 0.7         | 140.0         | 0.0            | 394.9                       |
| Apr              | 365.5  | 0.0                                  | 0.0                    | 0.0                      | 333.6                   | 31.9                         | 0.0           | 554.3   | 0.9                        | 0.0         | 0.0           | 0.0            | 389.4                       |
| May              | 96.8   | 0.0                                  | 0.0                    | 0.0                      | 84.2                    | 12.6                         | 0.0           | 181.2   | 0.5                        | 0.0         | 0.0           | 0.0            | 401.1                       |
| Jun              | 467.9  | 0.0                                  | 0.0                    | 0.0                      | 455.9                   | 12.0                         | 0.0           | 89.8  | 0.4                        | 0.0         | 0.0           | 0.0            | 232.0                       |
| Jul              | 1022.0   | 0.0                                  | 0.0                    | 0.0                      | 1022.0                  | 0.0                          | 0.0           | 108.8   | 0.9                        | 0.0         | 0.0           | 0.0            | 282.1                       |
| Aug              | 267.5  | 0.0                                  | 0.0                    | 0.0                      | 261.0                   | 6.5                          | 0.0           | 137.7   | 0.4                        | 0.0         | 0.0           | 0.0            | 189.3                       |
| Sep              | 112.6  | 0.0                                  | 0.0                    | 0.0                      | 105.4                   | 7.2                          | 0.0           | 25.8  | 0.3                        | 0.0         | 0.0           | 0.0            | 189.3                       |
| Oct              | 489.3  | 0.0                                  | 0.0                    | 413.3                    | 76.1                    | 0.0                          | 0.0           | 35.5  | 0.7                        | 0.0         | 0.0           | 0.0            | 227.3                       |
| Nov              | 156.6  | 0.0                                  | 0.0                    | 59.5                     | 46.7                    | 50.3                         | 0.0           | 175.3   | 0.3                        | 0.0         | 0.0           | 0.0            | 170.8                       |
| Dec              | 7.3  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 7.3                          | 0.0           | 7.9   | 0.3                        | 0.0         | 0.0           | 0.0            | 137.7                       |
| Sub-total (2020) | 4702.9   | 0.0                                  | 0.0                    | 760.8                    | 3706.7                  | 235.5                        | 0.0           | 1767.1  | 7.6                        | 2.4         | 755.0         | 0.0            | 3470.8                      |
| <b>2021</b>      |  |                                      |                        |                          |                         |                              |               |   |                            |             |               |                |                             |
| Jan              | 0.0  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0           | 0.0            | 218.0                       |
| Feb              | 0.0  |                                      |                        |                          |                         |                              |               |   |                            |             |               |                |                             |
| Mar              | 0.0  |                                      |                        |                          |                         |                              |               |   |                            |             |               |                |                             |
| Apr              | 0.0  |                                      |                        |                          |                         |                              |               |   |                            |             |               |                |                             |
| May              | 0.0  |                                      |                        |                          |                         |                              |               |   |                            |             |               |                |                             |
| Jun              | 0.0  |                                      |                        |                          |                         |                              |               |   |                            |             |               |                |                             |
| Sub-total (2021) | 0.0  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0           | 0.0            | 218.0                       |
| <b>Total</b>     | <b>252140.7</b>  | <b>0.0</b>                           | <b>25232.0</b>         | <b>143076.9</b>          | <b>72457.6</b>          | <b>11374.1</b>               | <b>0.0</b>    | <b>11909.2</b>                                    | <b>35.8</b>                | <b>5.1</b>  | <b>7356.2</b> | <b>3.2</b>     | <b>15355.4</b>              |

**Table I-1: Monthly Waste Flow Table for M+ Museum**

| Month | Actual Quantities of Inert C&D Materials Generated Monthly |                                      |                        |                          |                         |                              |               | Actual Quantities of C&D Wastes Generated Monthly |                            |             |              |                |                             |
|-------|--|--------------------------------------|------------------------|--------------------------|-------------------------|------------------------------|---------------|---|----------------------------|-------------|--------------|----------------|-----------------------------|
|       | Total Quantity Generated                                   | Hard Rocks and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Disposed to Sorting Facility | Imported Fill | Metals  | Paper/ Cardboard Packaging | Plastics    | Wood/ Timber | Chemical Waste | Others, e.g. General Refuse |
|       | (in tonnes)  | (in tonnes)                          | (in tonnes)            | (in tonnes)              | (in tonnes)             | (in tonnes)                  | (in tonnes)   | (in tonnes)                                       | (in tonnes)                | (in tonnes) | (in tonnes)  | (in tonnes)    | (in tonnes)                 |

Note:

0 tonne, 0 tonne, 0 tonne, 0 tonne of inert C&D material were disposed of as public fill to Chai Wan Public Fill Barging Point, Tuen Mun Area 38, Tseung Kwan O Area 137 Public Fill and Tseung Kwan O Area 137 Sorting Facility respectively in the reporting month.

For inert C&D materials reused in other projects, the projects refer to (1) Green Valley; (2) Advance Works for Shek Wu Hui Sewage Treatment Works (3) Design and Construction of Kai Tak Cable Tunnel, CLP; (4) MTR Contract 1002 Whampoa Station and Overrun Tunnel; (5) CEDD Tuen Mun Area 54 Contract No. CV/2015/03; (6) Union Construction Ltd.'s site; (7) Foundation Works at Marriot Hotel at Ocean Park.(8) Ming Tai warehoues (9) No.1 Plantation Road; (10) L1 lyric theather (11) sales to Ho Jet Plant (12) to J3868 Wales Hospital Project; (13) to J3888 AA's ITT project; (14) to J3908 AA's T2 project



# **Lyric Theatre Complex**

**Table I-2: Monthly Waste Flow Table for Lyric Theatre Complex**

| Month            | Actual Quantities of Inert C&D Materials Generated Monthly |                                      |                        |                          |                         |                              |               | Actual Quantities of C&D Wastes Generated Monthly |                            |             |              |                |                             |
|------------------|--|--------------------------------------|------------------------|--------------------------|-------------------------|------------------------------|---------------|---|----------------------------|-------------|--------------|----------------|-----------------------------|
|                  | Total Quantity Generated                                   | Hard Rocks and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Disposed to Sorting Facility | Imported Fill | Metals  | Paper/ Cardboard Packaging | Plastics    | Wood/ Timber | Chemical Waste | Others, e.g. General Refuse |
|                  | (in tonnes)  | (in tonnes)                          | (in tonnes)            | (in tonnes)              | (in tonnes)             | (in tonnes)                  | (in tonnes)   | (in tonnes)                                       | (in tonnes)                | (in tonnes) | (in tonnes)  | (in tonnes)    | (in tonnes)                 |
| <b>2016</b>      |  |                                      |                        |                          |                         |                              |               |   |                            |             |              |                |                             |
| Mar              | 2702.1   | 0.0                                  | 0.0                    | 0.0                      | 2702.1                  | 0.0                          | 0.0           | 4.5   | 0.1                        | 0.0         | 0.0          | 0.0            | 30.6                        |
| Apr              | 8631.5   | 0.0                                  | 0.0                    | 0.0                      | 8631.5                  | 0.0                          | 0.0           | 16.0  | 0.0                        | 0.0         | 0.0          | 0.0            | 19.2                        |
| May              | 12487.8  | 0.0                                  | 0.0                    | 0.0                      | 12487.8                 | 0.0                          | 0.0           | 34.0  | 0.0                        | 0.0         | 0.0          | 0.7            | 60.5                        |
| Jun              | 8600.8   | 0.0                                  | 0.0                    | 0.0                      | 8600.8                  | 0.0                          | 0.0           | 31.4  | 0.2                        | 0.0         | 0.0          | 0.5            | 13.5                        |
| Jul              | 12624.2  | 0.0                                  | 0.0                    | 0.0                      | 12624.2                 | 0.0                          | 0.0           | 19.6  | 0.0                        | 0.0         | 0.0          | 2.0            | 9.9                         |
| Aug              | 14419.9  | 0.0                                  | 0.0                    | 0.0                      | 14419.9                 | 0.0                          | 0.0           | 43.9  | 0.0                        | 0.0         | 0.0          | 0.0            | 11.1                        |
| Sep              | 13671.3  | 0.0                                  | 0.0                    | 0.0                      | 13671.3                 | 0.0                          | 0.0           | 59.8  | 0.0                        | 0.0         | 0.0          | 1.6            | 12.4                        |
| Oct              | 13088.9  | 0.0                                  | 0.0                    | 0.0                      | 13088.9                 | 0.0                          | 0.0           | 36.9  | 0.2                        | 1.5         | 0.0          | 0.0            | 15.2                        |
| Nov              | 12424.7  | 0.0                                  | 0.0                    | 0.0                      | 12424.7                 | 0.0                          | 0.0           | 74.7  | 0.0                        | 0.0         | 0.0          | 1.4            | 10.2                        |
| Dec              | 12487.6  | 0.0                                  | 0.0                    | 0.0                      | 12487.6                 | 0.0                          | 0.0           | 13.9  | 0.0                        | 0.0         | 0.0          | 1.3            | 9.0                         |
| Sub-total (2016) | 111138.8   | 0.0                                  | 0.0                    | 0.0                      | 111138.8                | 0.0                          | 0.0           | 334.5   | 0.4                        | 1.5         | 0.0          | 7.6            | 191.6                       |
| <b>2017</b>      |  |                                      |                        |                          |                         |                              |               |   |                            |             |              |                |                             |
| Jan              | 9607.8   | 0.0                                  | 0.0                    | 0.0                      | 9607.8                  | 0.0                          | 0.0           | 29.5  | 0.0                        | 0.0         | 0.0          | 0.0            | 7.3                         |
| Feb              | 9108.2   | 0.0                                  | 0.0                    | 0.0                      | 9108.2                  | 0.0                          | 0.0           | 50.2  | 0.2                        | 0.0         | 0.0          | 0.7            | 9.8                         |
| Mar              | 11361.7  | 0.0                                  | 0.0                    | 0.0                      | 11361.7                 | 0.0                          | 0.0           | 16.1  | 0.0                        | 0.0         | 0.0          | 1.4            | 8.5                         |
| Apr              | 2591.5   | 0.0                                  | 0.0                    | 0.0                      | 2591.5                  | 0.0                          | 0.0           | 35.7  | 0.0                        | 0.0         | 0.0          | 0.0            | 4.7                         |
| May              | 2579.3   | 0.0                                  | 0.0                    | 99.0                     | 2480.3                  | 0.0                          | 0.0           | 20.9  | 0.1                        | 0.0         | 0.0          | 0.5            | 10.0                        |
| Jun              | 476.0  | 0.0                                  | 0.0                    | 341.0                    | 129.7                   | 5.3                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 7.6                         |
| Jul              | 3419.0   | 0.0                                  | 0.0                    | 804.0                    | 2615.0                  | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 17.8                        |
| Aug              | 3730.9   | 0.0                                  | 0.0                    | 1377.5                   | 2353.4                  | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 4.4                         |
| Sep              | 2108.2   | 0.0                                  | 0.0                    | 1133.5                   | 974.7                   | 0.0                          | 0.0           | 34.6  | 0.2                        | 0.0         | 0.0          | 0.0            | 10.8                        |
| Oct              | 9159.0   | 0.0                                  | 0.0                    | 7868.0                   | 1291.0                  | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.7            | 9.3                         |
| Nov              | 5095.4   | 0.0                                  | 0.0                    | 4352.0                   | 725.2                   | 18.1                         | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 38.8                        |
| Dec              | 3856.2   | 0.0                                  | 0.0                    | 3076.0                   | 780.2                   | 0.0                          | 0.0           | 0.0   | 0.2                        | 0.0         | 0.0          | 0.4            | 8.4                         |
| Sub-total (2017) | 63093.1  | 0.0                                  | 0.0                    | 19051.0                  | 44018.7                 | 23.4                         | 0.0           | 187.1   | 0.7                        | 0.0         | 0.0          | 3.8            | 137.3                       |

**Table I-2: Monthly Waste Flow Table for Lyric Theatre Complex**

| Month            | Actual Quantities of Inert C&D Materials Generated Monthly |                                      |                        |                          |                         |                              |               | Actual Quantities of C&D Wastes Generated Monthly |                            |             |              |                |                             |
|------------------|--|--------------------------------------|------------------------|--------------------------|-------------------------|------------------------------|---------------|---|----------------------------|-------------|--------------|----------------|-----------------------------|
|                  | Total Quantity Generated                                   | Hard Rocks and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Disposed to Sorting Facility | Imported Fill | Metals  | Paper/ Cardboard Packaging | Plastics    | Wood/ Timber | Chemical Waste | Others, e.g. General Refuse |
|                  | (in tonnes)  | (in tonnes)                          | (in tonnes)            | (in tonnes)              | (in tonnes)             | (in tonnes)                  | (in tonnes)   | (in tonnes)                                       | (in tonnes)                | (in tonnes) | (in tonnes)  | (in tonnes)    | (in tonnes)                 |
| <b>2018</b>      |  |                                      |                        |                          |                         |                              |               |   |                            |             |              |                |                             |
| Jan              | 0.0  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 0.0                         |
| Feb              | 0.0  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 1.5                         |
| Mar              | 6120.2   | 0.0                                  | 0.0                    | 5782.0                   | 338.2                   | 0.0                          | 0.0           | 0.0   | 0.0                        | 1.0         | 0.0          | 0.5            | 17.6                        |
| Apr              | 14460.3  | 0.0                                  | 0.0                    | 12484.1                  | 1976.3                  | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.2         | 0.0          | 0.0            | 7.6                         |
| May              | 59783.7  | 0.0                                  | 0.0                    | 46989.0                  | 12794.7                 | 0.0                          | 0.0           | 59.6  | 0.0                        | 0.0         | 0.0          | 0.0            | 9.4                         |
| Jun              | 53117.5  | 0.0                                  | 0.0                    | 37642.8                  | 15474.7                 | 0.0                          | 0.0           | 51.5  | 0.2                        | 0.0         | 0.0          | 0.0            | 12.8                        |
| Jul              | 89901.5  | 0.0                                  | 0.0                    | 85317.1                  | 4584.4                  | 0.0                          | 165.1         | 114.6   | 0.0                        | 0.0         | 0.0          | 0.0            | 41.3                        |
| Aug              | 35137.3  | 0.0                                  | 0.0                    | 33731.6                  | 1405.7                  | 0.0                          | 214.3         | 148.1   | 0.0                        | 0.0         | 0.0          | 0.0            | 48.5                        |
| Sep              | 4924.3   | 0.0                                  | 0.0                    | 4641.2                   | 196.1                   | 87.0                         | 174.6         | 40.0  | 0.0                        | 0.0         | 0.0          | 0.0            | 179.2                       |
| Oct              | 19099.9  | 0.0                                  | 0.0                    | 11301.0                  | 7642.8                  | 156.1                        | 0.0           | 106.3   | 0.4                        | 0.0         | 0.0          | 0.0            | 528.5                       |
| Nov              | 104168.0   | 0.0                                  | 0.0                    | 79811.6                  | 24351.0                 | 5.3                          | 0.0           | 54.5  | 0.0                        | 0.6         | 0.0          | 0.0            | 31.5                        |
| Dec              | 62989.9  | 0.0                                  | 0.0                    | 51284.4                  | 11699.9                 | 5.6                          | 0.0           | 95.1  | 0.0                        | 0.6         | 0.0          | 0.0            | 65.9                        |
| Sub-total (2018) | 449702.6   | 0.0                                  | 0.0                    | 368984.8                 | 80463.7                 | 254.0                        | 553.9         | 669.7   | 0.5                        | 2.4         | 0.0          | 0.5            | 943.7                       |
| <b>2019</b>      |  |                                      |                        |                          |                         |                              |               |   |                            |             |              |                |                             |
| Jan              | 74479.1  | 0.0                                  | 0.0                    | 69249.5                  | 5229.7                  | 0.0                          | 318.0         | 326.7   | 0.2                        | 0.0         | 0.0          | 0.0            | 76.3                        |
| Feb              | 21969.9  | 0.0                                  | 0.0                    | 17723.9                  | 4246.0                  | 0.0                          | 16.5          | 55.2  | 0.0                        | 0.0         | 0.0          | 0.0            | 26.7                        |
| Mar              | 19311.9  | 0.0                                  | 0.0                    | 8569.9                   | 10742.0                 | 0.0                          | 337.8         | 61.5  | 0.0                        | 0.0         | 0.0          | 0.0            | 36.3                        |
| Apr              | 28559.9  | 0.0                                  | 0.0                    | 21280.3                  | 7279.6                  | 0.0                          | 0.0           | 32.6  | 0.0                        | 0.8         | 0.0          | 0.0            | 24.9                        |
| May              | 45418.0  | 0.0                                  | 0.0                    | 11200.6                  | 34217.4                 | 0.0                          | 0.0           | 27.4  | 0.2                        | 0.5         | 0.0          | 0.0            | 33.7                        |
| Jun              | 66633.4  | 0.0                                  | 0.0                    | 23874.5                  | 42748.0                 | 10.9                         | 59.2          | 11.9  | 0.0                        | 0.9         | 0.0          | 0.0            | 35.3                        |
| Jul              | 36619.6  | 0.0                                  | 0.0                    | 1632.7                   | 34960.9                 | 26.0                         | 64.4          | 120.7   | 0.0                        | 0.0         | 0.0          | 0.0            | 57.9                        |
| Aug              | 2526.8   | 0.0                                  | 0.0                    | 0.0                      | 2499.0                  | 27.8                         | 31.9          | 40.2  | 0.0                        | 0.8         | 0.0          | 0.0            | 66.3                        |
| Sep              | 4117.6   | 0.0                                  | 0.0                    | 0.0                      | 4088.7                  | 28.9                         | 95.2          | 19.0  | 0.0                        | 0.6         | 0.0          | 0.0            | 127.4                       |
| Oct              | 6974.2   | 0.0                                  | 0.0                    | 0.0                      | 6948.1                  | 26.1                         | 15.9          | 11.4  | 0.2                        | 1.0         | 0.0          | 0.6            | 223.6                       |
| Nov              | 5334.4   | 0.0                                  | 0.0                    | 0.0                      | 5304.1                  | 30.3                         | 0.0           | 8.9   | 0.0                        | 0.0         | 0.0          | 0.0            | 151.6                       |
| Dec              | 6236.8   | 0.0                                  | 0.0                    | 0.0                      | 6236.8                  | 0.0                          | 0.0           | 70.6  | 0.0                        | 0.0         | 0.0          | 0.0            | 98.9                        |
| Sub-total (2019) | 318181.6   | 0.0                                  | 0.0                    | 153531.3                 | 164500.1                | 150.1                        | 938.9         | 785.8   | 0.6                        | 4.6         | 0.0          | 0.6            | 959.0                       |

**Table I-2: Monthly Waste Flow Table for Lyric Theatre Complex**

| Month            | Actual Quantities of Inert C&D Materials Generated Monthly |                                      |                        |                          |                         |                              |               | Actual Quantities of C&D Wastes Generated Monthly |                            |             |              |                |                             |
|------------------|--|--------------------------------------|------------------------|--------------------------|-------------------------|------------------------------|---------------|---|----------------------------|-------------|--------------|----------------|-----------------------------|
|                  | Total Quantity Generated                                   | Hard Rocks and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Disposed to Sorting Facility | Imported Fill | Metals  | Paper/ Cardboard Packaging | Plastics    | Wood/ Timber | Chemical Waste | Others, e.g. General Refuse |
|                  | (in tonnes)  | (in tonnes)                          | (in tonnes)            | (in tonnes)              | (in tonnes)             | (in tonnes)                  | (in tonnes)   | (in tonnes)                                       | (in tonnes)                | (in tonnes) | (in tonnes)  | (in tonnes)    | (in tonnes)                 |
| <b>2020</b>      |  |                                      |                        |                          |                         |                              |               |   |                            |             |              |                |                             |
| Jan              | 7089.9   | 0.0                                  | 0.0                    | 0.0                      | 7089.9                  | 0.0                          | 0.0           | 10.6  | 0.2                        | 0.0         | 0.0          | 0.0            | 65.7                        |
| Feb              | 16822.3  | 0.0                                  | 0.0                    | 0.0                      | 16822.3                 | 0.0                          | 0.0           | 232.2   | 0.1                        | 0.0         | 0.0          | 0.0            | 66.3                        |
| Mar              | 6559.0   | 0.0                                  | 0.0                    | 0.0                      | 6559.0                  | 0.0                          | 110.4         | 63.1  | 0.0                        | 0.9         | 0.0          | 0.0            | 138.3                       |
| Apr              | 4997.9   | 0.0                                  | 0.0                    | 1615.7                   | 3382.2                  | 0.0                          | 159.2         | 1123.9  | 1.9                        | 0.0         | 0.0          | 0.0            | 113.2                       |
| May              | 2236.0   | 0.0                                  | 0.0                    | 452.3                    | 1783.6                  | 0.0                          | 0.0           | 406.5   | 0.0                        | 0.0         | 0.0          | 0.0            | 188.8                       |
| Jun              | 1134.3   | 0.0                                  | 0.0                    | 0.0                      | 1134.3                  | 0.0                          | 31.5          | 262.6   | 0.2                        | 0.6         | 0.0          | 0.0            | 210.6                       |
| Jul              | 148.8  | 0.0                                  | 0.0                    | 0.0                      | 148.8                   | 0.0                          | 31.5          | 458.5   | 0.5                        | 0.0         | 0.0          | 0.0            | 220.0                       |
| Aug              | 540.7  | 0.0                                  | 0.0                    | 0.0                      | 540.7                   | 0.0                          | 0.0           | 340.8   | 0.0                        | 0.0         | 0.0          | 0.0            | 238.3                       |
| Sep              | 1432.3   | 0.0                                  | 0.0                    | 0.0                      | 1432.3                  | 0.0                          | 0.0           | 750.7   | 0.2                        | 0.0         | 0.0          | 0.0            | 291.9                       |
| Oct              | 1381.5   | 0.0                                  | 0.0                    | 0.0                      | 1381.5                  | 0.0                          | 0.0           | 717.9   | 0.2                        | 0.0         | 0.0          | 0.0            | 400.2                       |
| Nov              | 1444.1   | 0.0                                  | 0.0                    | 0.0                      | 1437.4                  | 6.7                          | 475.8         | 473.6   | 0.2                        | 0.5         | 0.0          | 0.0            | 377.8                       |
| Dec              | 793.8  | 0.0                                  | 0.0                    | 0.0                      | 793.8                   | 0.0                          | 0.0           | 478.3   | 0.2                        | 0.0         | 0.0          | 0.0            | 435.8                       |
| Sub-total (2020) | 44580.6  | 0.0                                  | 0.0                    | 2068.1                   | 42505.8                 | 6.7                          | 808.3         | 5318.7  | 3.7                        | 2.0         | 0.0          | 0.0            | 2746.8                      |
| <b>2021</b>      |  |                                      |                        |                          |                         |                              |               |   |                            |             |              |                |                             |
| Jan              | 881.4  | 0.0                                  | 0.0                    | 0.0                      | 881.4                   | 0.0                          | 0.0           | 835.1   | 0.0                        | 0.0         | 0.0          | 0.0            | 497.0                       |
| Feb              | 0.0  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 0.0                         |
| Mar              | 0.0  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 0.0                         |
| Apr              | 0.0  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 0.0                         |
| May              | 0.0  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 0.0                         |
| Jun              | 0.0  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 0.0                         |
| Jul              | 0.0  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 0.0                         |
| Aug              | 0.0  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 0.0                         |
| Sep              | 0.0  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 0.0                         |
| Oct              | 0.0  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 0.0                         |
| Nov              | 0.0  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 0.0                         |
| Dec              | 0.0  | 0.0                                  | 0.0                    | 0.0                      | 0.0                     | 0.0                          | 0.0           | 0.0   | 0.0                        | 0.0         | 0.0          | 0.0            | 0.0                         |
| Sub-total (2021) | 881.4  | 0.0                                  | 0.0                    | 0.0                      | 881.4                   | 0.0                          | 0.0           | 835.1   | 0.0                        | 0.0         | 0.0          | 0.0            | 497.0                       |
| <b>Total</b>     | <b>987578.0</b>  | <b>0.0</b>                           | <b>0.0</b>             | <b>543635.2</b>          | <b>443508.5</b>         | <b>434.3</b>                 | <b>2301.1</b> | <b>8130.8</b>                                     | <b>5.8</b>                 | <b>10.5</b> | <b>0.0</b>   | <b>12.5</b>    | <b>5475.4</b>               |

**Table I-2: Monthly Waste Flow Table for Lyric Theatre Complex**

| Month | Actual Quantities of Inert C&D Materials Generated Monthly |                                      |                        |                          |                         |                              |               | Actual Quantities of C&D Wastes Generated Monthly |                            |             |              |                |                             |
|-------|--|--------------------------------------|------------------------|--------------------------|-------------------------|------------------------------|---------------|---|----------------------------|-------------|--------------|----------------|-----------------------------|
|       | Total Quantity Generated                                   | Hard Rocks and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Disposed to Sorting Facility | Imported Fill | Metals  | Paper/ Cardboard Packaging | Plastics    | Wood/ Timber | Chemical Waste | Others, e.g. General Refuse |
|       | (in tonnes)  | (in tonnes)                          | (in tonnes)            | (in tonnes)              | (in tonnes)             | (in tonnes)                  | (in tonnes)   | (in tonnes)                                       | (in tonnes)                | (in tonnes) | (in tonnes)  | (in tonnes)    | (in tonnes)                 |

Note:

- 705.84 tonnes and 175.55 tonnes of inert C&D materials were disposed of as public fill to Tseung Kwan O Area 137 Public Fill and Tuen Mun Area 38 Public Fill respectively in the reporting month.

## **J. Environmental Mitigation Measures – Implementation Status**

**Table J-1: Environmental Mitigation Measures Implementation Status (Jan 2021)**

| EM&A Ref.                         | Recommendation Measures   | Implementation Stage |    |     |
|-----------------------------------|---|----------------------|----|-----|
|                                   |   | M+ Museum            | L1 | L2  |
| Air Quality Impact (Construction) |   |                      |    |     |
| 2.1 & 10.3.1                      | <b>General Dust Control Measures</b><br>Frequent water spraying for active construction areas (12 times a day or once every one hour), including Heavy construction activities such as construction of buildings or roads, drilling, ground excavation, cut and fill operations (i.e., earth moving)  | ✓                    | ✓  | ✓   |
| 2.1 & 10.3.1                      | <b>Best Practice For Dust Control</b><br>The relevant best practices for dust control as stipulated in the Air Pollution Control (construction Dust) Regulation should be adopted to further reduce the construction dust impacts from the Project. These best practices include:<br><i>Good Site Management</i> <ul style="list-style-type: none"><li>Good site management is important to help reducing potential air quality impact down to an acceptable level. As a general guide, the Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimise the release of visible dust emission. Any piles of materials accumulated on or around the work areas should be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimising generation of fugitive dust emissions. The material should be handled properly to prevent fugitive dust emission before cleaning.</li></ul> <i>Disturbed Parts of the Roads</i> <ul style="list-style-type: none"><li>Each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or</li><li>Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet.</li></ul> | Rem                  | ✓  | Obs |
|                                   |   | ✓                    | ✓  | ✓   |
|                                   |   | ✓                    | ✓  | ✓   |

| EM&A Ref. | Recommendation Measures   | Implementation Stage                     |  |  |
|-----------|---|--|--|--|
|           |   | M+ Museum                                | L1                                       | L2                                       |
|           | <i>Exposed Earth</i>  |  |  |  |
|           | <ul style="list-style-type: none"> <li>Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies.</li> </ul>  | N/A<br>No exposed earth in this project. | N/A<br>No exposed earth in this project. | N/A<br>No exposed earth in this project. |
|           | <i>Loading, Unloading or Transfer of Dusty Materials</i>  |  |  |  |
|           | <ul style="list-style-type: none"> <li>All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet.</li> </ul>   | ✓  | ✓  | ✓  |
|           | <i>Debris Handling</i>  |  |  |  |
|           | <ul style="list-style-type: none"> <li>Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides.</li> <li>Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped.</li> </ul>   | ✓<br>✓                                   | ✓<br>✓                                   | ✓<br>✓                                   |
|           | <i>Transport of Dusty Materials</i>   |  |  |  |
|           | <ul style="list-style-type: none"> <li>Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards.</li> </ul>  | ✓  | ✓  | ✓  |
|           | <i>Wheel washing</i>  |  |  |  |
|           | <ul style="list-style-type: none"> <li>Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels.</li> </ul>  | ✓  | ✓  | ✓  |
|           | <i>Use of vehicles</i>  |  |  |  |
|           | <ul style="list-style-type: none"> <li>The speed of the trucks within the site should be controlled to about 10km/hour in order to reduce adverse dust impacts and secure the safe movement around the site.</li> <li>Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels.</li> <li>Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle.</li> </ul> | ✓<br>✓<br>✓                              | ✓<br>✓<br>✓                              | ✓<br>✓<br>✓                              |



| EM&A Ref.    | Recommendation Measures   | Implementation Stage  |   |   |
|--------------|---|---|---|---|
|              |   | M+ Museum   | L1  | L2  |
|              | <p><i>Site hoarding</i></p> <ul style="list-style-type: none"> <li>Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit.</li> </ul>  | ✓   | ✓   | ✓   |
| 2.1 & 10.3.1 | <p><b>Best Practicable Means for Cement Works (Concrete Batching Plant)</b></p> <p>The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93) should be followed and implemented to further reduce the construction dust impacts of the Project. These best practices include:</p> <p>Exhaust from Dust Arrestment Plant</p> <ul style="list-style-type: none"> <li>Wherever possible the final discharge point from particulate matter arrestment plant, where is not necessary to achieve dispersion from residual pollutants, should be at low level to minimise the effect on the local community in the case of abnormal emissions and to facilitate maintenance and inspection</li> </ul> <p>Emission Limits</p> <ul style="list-style-type: none"> <li>All emissions to air, other than steam or water vapour, shall be colourless and free from persistent mist or smoke</li> </ul> <p>Engineering Design/Technical Requirements</p> <ul style="list-style-type: none"> <li>As a general guidance, the loading, unloading, handling and storage of fuel, raw materials, products, wastes or by-products should be carried out in a manner so as to prevent the release of visible dust and/or other noxious or offensive emissions</li> </ul> | <p>N/A</p> <p>No concrete batching plant in this project.</p> | <p>N/A</p> <p>No concrete batching plant in this project.</p> | <p>N/A</p> <p>No concrete batching plant in this project.</p> |
|              | <p><b>Non-Road Mobile Machinery (NRMM):</b></p> <p>All NRMMs operating on-site which are subject to emission control of Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation are approved/exempted (as the case may be) and affixed with the requisite approval/exemption labels.</p>  | ✓   | ✓   | ✓   |

| EM&A Ref.                   | Recommendation Measures  | Implementation Stage |    |    |
|-----------------------------|--|----------------------|----|----|
|                             |  | M+ Museum            | L1 | L2 |
| Noise Impact (Construction) |  |                      |    |    |
| 3.1 & 10.4.1                | <b>Good Site Practice</b><br>Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during each phase of construction: <ul style="list-style-type: none"> <li>only well-maintained plant to be operated on-site and plant should be serviced regularly during the construction works;</li> <li>machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum</li> <li>plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs;</li> <li>mobile plant should be sited as far away from NSRs as possible; and</li> <li>material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site construction activities.</li> </ul> | ✓                    | ✓  | ✓  |
| 3.1 & 10.4.1                | <b>Adoption of Quieter PME</b><br>The recommended quieter PME adopted in the assessment were taken from the EPD's QPME Inventory and " <i>Sound Power Levels of Other Commonly Used PME</i> " are presented in <b>Table 4.26</b> in the EIA report. It should be noted that the silenced PME selected for assessment can be found in Hong Kong.  | ✓                    | ✓  | ✓  |
| 3.1 & 10.4.1                | <b>Use of Movable Noise Barriers</b><br>Movable noise barriers can be very effective in screening noise from particular items of plant when constructing the Project. Noise barriers located along the active works area close to the noise generating component of a PME could produce at least 10 dB(A) screening for stationary plant and 5 dB(A) for mobile plant provided the direct line of sight between the PME and the NSRs is blocked.   | ✓                    | ✓  | ✓  |
| 3.1 & 10.4.1                | <b>Use of Noise Enclosure/ Acoustic Shed</b><br>The use of noise enclosure or acoustic shed is to cover stationary PME such as air compressor and concrete pump. With the adoption of the noise enclosure, the PME could be completely screened, and noise reduction of 15 dB(A) can be achieved according to the EIAO Guidance Note No. 9/2010.   | ✓                    | ✓  | ✓  |

| EM&A Ref.                                  | Recommendation Measures   | Implementation Stage                                |   |   |
|--|---|---|---|---|
|  |   | M+ Museum   | L1  | L2  |
| 3.1 &<br>10.4.1                            | <b>Use of Noise Insulating Fabric</b><br>Noise insulating fabric can also be adopted for certain PME (e.g. drill rig, pilling machine etc). The fabric should be lapped such that there are no openings or gaps on the joints. According to the approved Tsim Sha Tsui Station Northern Subway EIA report (AEIAR-127/2008), a noise reduction of 10 dB(A) can be achieved for the PME lapped with the noise insulating fabric.  | ✓   | ✓   | ✓   |
| 3.1 &<br>10.4.1                            | <b>Scheduling of Construction Works outside School Examination Periods</b><br>During construction phase, the contractor should liaise with the educational institutions (including NSRs LCS and CRGPS) to obtain the examination schedule and avoid the noisy construction activities during school examination periods.  | N/A<br>No educational institutions nearby the site. | N/A<br>No educational institutions nearby the site. | N/A<br>No educational institutions nearby the site. |
| <b>Water Quality Impact (Construction)</b> |   |   |   |   |
| 4.1 &<br>10.5.1                            | <b>Construction site runoff and drainage</b><br>The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended to protect water quality and sensitive uses of the coastal area, and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impacts: <ul style="list-style-type: none"> <li>At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities. The design of the temporary on-site drainage system should be undertaken by the WKCDA's Contractor prior to the commencement of construction;</li> </ul> | ✓   | ✓   | Rem   |

| EM&A Ref. | Recommendation Measures   | Implementation Stage |     |    |
|-----------|---|----------------------|-----|----|
|           |   | M+ Museum            | L1  | L2 |
|           | <ul style="list-style-type: none"> <li>Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the WKCDA's Contractor prior to the commencement of construction.</li> </ul>  | ✓                    | ✓   | ✓  |
|           | <ul style="list-style-type: none"> <li>All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.</li> </ul>   | ✓                    | Rem | ✓  |
|           | <ul style="list-style-type: none"> <li>Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities.</li> </ul>   | ✓                    | ✓   | ✓  |
|           | <ul style="list-style-type: none"> <li>All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exit where practicable. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains.</li> </ul> | ✓                    | ✓   | ✓  |
|           | <ul style="list-style-type: none"> <li>Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.</li> </ul>   | ✓                    | ✓   | ✓  |

| EM&A Ref. | Recommendation Measures  | Implementation Stage                                   |  |  |
|-----------|--|--|--|--|
|           |  | M+ Museum  | L1   | L2   |
|           | <ul style="list-style-type: none"> <li>Manholes (including newly constructed ones) should be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and stormwater runoff being directed into foul sewers.</li> </ul>   | Rem  | ✓  | ✓  |
|           | <ul style="list-style-type: none"> <li>Precautions should be taken at any time of the year when rainstorms are likely. Actions should be taken when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC Note PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.</li> </ul>           | ✓  | ✓  | ✓  |
|           | <ul style="list-style-type: none"> <li>Bentonite slurries used in piling or slurry walling should be reconditioned and reused wherever practicable. Temporary enclosed storage locations should be provided on-site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.</li> </ul> | N/A<br>No bentonite slurries are used in this project. | N/A<br>No bentonite slurries are used in this project. | N/A<br>No bentonite slurries are used in this project. |
|           | <b>Barging facilities and activities</b>   |  |  |  |
|           | Recommendations for good site practices during operation of the proposed barging point include:  |  |  |  |
|           | <ul style="list-style-type: none"> <li>All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;</li> </ul>  | N/A<br>No barging facilities in this project.          | N/A<br>No barging facilities in this project.          | N/A<br>No barging facilities in this project.          |
|           | <ul style="list-style-type: none"> <li>Loading of barges and hoppers should be controlled to prevent splashing of material into the surrounding water. Barges or hoppers should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation;</li> </ul>  | N/A<br>No barging facilities in this project.          | N/A<br>No barging facilities in this project.          | N/A<br>No barging facilities in this project.          |
|           | <ul style="list-style-type: none"> <li>All hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; and</li> </ul>   | N/A<br>No barging facilities in this project.          | N/A<br>No barging facilities in this project.          | N/A<br>No barging facilities in this project.          |
|           | <ul style="list-style-type: none"> <li>Construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site.</li> </ul>   | N/A<br>No barging facilities in this project.          | N/A<br>No barging facilities in this project.          | N/A<br>No barging facilities in this project.          |

| EM&A Ref.   | Recommendation Measures  | Implementation Stage |     |    |
|---|--|----------------------|-----|----|
|   |  | M+ Museum            | L1  | L2 |
| 4.1 & 10.5.1  | <b>Sewage effluent from construction workforce</b><br>Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.   | ✓                    | ✓   | ✓  |
| 4.1 & 10.5.1  | <b>General construction activities</b> <ul style="list-style-type: none"> <li>Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby storm water drain. Stockpiles of cement and other construction materials should be kept covered when not being used.</li> <li>Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby storm water drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event.</li> </ul> | ✓                    | ✓   | ✓  |
|   |  | ✓                    | Obs | ✓  |
| <b>Waste Management Implications (Construction)</b> |  |                      |     |    |
| 6.1 & 10.7.1  | <b>Good Site Practices</b><br>Recommendations for good site practices during the construction activities include:  |                      |     |    |
|   | <ul style="list-style-type: none"> <li>Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site</li> </ul>  | ✓                    | ✓   | ✓  |
|   | <ul style="list-style-type: none"> <li>Training of site personnel in proper waste management and chemical handling procedures</li> </ul>   | ✓                    | ✓   | ✓  |
|   | <ul style="list-style-type: none"> <li>Provision of sufficient waste disposal points and regular collection of waste</li> </ul>  | ✓                    | ✓   | ✓  |
|   | <ul style="list-style-type: none"> <li>Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by either covering trucks or by transporting wastes in enclosed containers</li> </ul>   | ✓                    | ✓   | ✓  |

| EM&A Ref.    | Recommendation Measures  | Implementation Stage |    |    |
|--------------|--|----------------------|----|----|
|              |  | M+ Museum            | L1 | L2 |
|              | <ul style="list-style-type: none"> <li>Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction to public roads</li> <li>Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting the inert or non-inert C&amp;D materials is not anticipated</li> </ul>  | ✓                    | ✓  | ✓  |
| 6.1 & 10.7.1 | <b>Waste Reduction Measures</b><br>Recommendations to achieve waste reduction include: <ul style="list-style-type: none"> <li>Sort inert C&amp;D material to recover any recyclable portions such as metals</li> <li>Segregation and storage of different types of waste in different containers or skips to enhance reuse or recycling of materials and their proper disposal</li> <li>Encourage collection of recyclable waste such as waste paper and aluminium cans by providing separate labelled bins to enable such waste to be segregated from other general refuse generated by the work force</li> <li>Proper site practices to minimise the potential for damage or contamination of inert C&amp;D materials</li> <li>Plan the use of construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of wastes</li> </ul>  | ✓                    | ✓  | ✓  |
| 6.1 & 10.7.1 | <b>Inert and Non-inert C&amp;D Materials</b><br>In order to minimise impacts resulting from collection and transportation of inert C&D material for off-site disposal, the excavated materials should be reused on-site as fill material as far as practicable. In addition, inert C&D material generated from excavation works could be reused as fill materials in local projects that require public fill for reclamation. <ul style="list-style-type: none"> <li>The surplus inert C&amp;D material will be disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong.</li> <li>Liaison with the CEDD Public Fill Committee (PFC) on the allocation of space for disposal of the inert C&amp;D materials at PFRF is underway. No construction work is allowed to proceed until all issues on management of inert C&amp;D materials have been resolved and all relevant arrangements have been endorsed by the relevant authorities including PFC and EPD.</li> </ul> | ✓                    | ✓  | ✓  |

| EM&A Ref.    | Recommendation Measures   | Implementation Stage |    |    |
|--------------|---|----------------------|----|----|
|              |   | M+ Museum            | L1 | L2 |
|              | <ul style="list-style-type: none"> <li>The C&amp;D materials generated from general site clearance should be sorted on site to segregate any inert materials for reuse or disposal of at PFRFs whereas the non-inert materials will be disposed of at the designated landfill site.</li> <li>In order to monitor the disposal of inert and non-inert C&amp;D materials at respectively PFRFs and the designated landfill site, and to control fly-tipping, it is recommended that the Contractor should follow the Technical Circular (Works) No. 6/2010 for Trip Ticket System for Disposal of Construction &amp; Demolition Materials issued by Development Bureau. In addition, it is also recommended that the Contractor should prepare and implement a Waste Management Plan detailing their various waste arising and waste management practices in accordance with the relevant requirements of the Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site.</li> </ul>  | ✓                    | ✓  | ✓  |
| 6.1 & 10.7.1 | <b>Chemical Waste</b> <ul style="list-style-type: none"> <li>If chemical wastes are produced at the construction site, the Contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the "Code of Practice on the Packaging Labelling and Storage of Chemical Wastes". Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor should use a licensed collector to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</li> <li>Potential environmental impacts arising from the handling activities (including storage, collection, transportation and disposal of chemical waste) are expected to be minimal with the implementation of appropriate mitigation measures as recommended.</li> </ul> | ✓                    | ✓  | ✓  |



| EM&A Ref.                                | Recommendation Measures  | Implementation Stage  |   |   |
|--|--|---|---|---|
|  |  | M+ Museum   | L1  | L2  |
| 6.1 & 10.7.1                             | <b>General Refuse</b><br>General refuse should be stored in enclosed bins or compaction units separated from inert C&D materials. A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from inert C&D materials. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.  | ✓   | ✓   | ✓   |
| <b>Land Contamination (Construction)</b> |  |   |   |   |
| 7.1 & 10.8.1                             | <p>The potential for land contamination issues at the TST Fire Station due to its future relocation will be confirmed by site investigation after land acquisition. Where necessary, mitigation measures for minimising potential exposure to contaminated materials (if any) or remediation measures will be identified. If contaminated land is identified (e.g., during decommissioning of fuel oil storage tanks) after the commencement of works, mitigation measures are proposed in order to minimise the potentially adverse effects on the health and safety of construction workers and impacts arising from the disposal of potentially contaminated materials.</p> <p>The following measures are proposed for excavation and transportation of contaminated material:</p> <ul style="list-style-type: none"> <li>To minimize the chance for construction workers to come into contact with any contaminated materials, bulk earth-moving excavation equipment should be employed;</li> <li>Contact with contaminated materials can be minimised by wearing appropriate clothing and personal protective equipment such as gloves and masks (especially when interacting directly with contaminated material), provision of washing facilities and prohibition of smoking and eating on site;</li> <li>Stockpiling of contaminated excavated materials on site should be avoided as far as possible;</li> </ul> | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
|  |  | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
|  |  | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |

| EM&A Ref.   | Recommendation Measures  | Implementation Stage  |   |   |
|---|--|---|---|---|
|   |  | M+ Museum   | L1  | L2  |
|   | <ul style="list-style-type: none"> <li>The use of contaminated soil for landscaping purpose should be avoided unless pre-treatment was carried out;</li> <li>Vehicles containing any contaminated excavated materials should be suitably covered to reduce dust emissions and/or release of contaminated wastewater;</li> <li>Truck bodies and tailgates should be sealed to stop any discharge;</li> <li>Only licensed waste haulers should be used to collect and transport contaminated material to treatment/disposal site and should be equipped with tracking system to avoid fly tipping;</li> <li>Speed control for trucks carrying contaminated materials should be exercised;</li> <li>Observe all relevant regulations in relation to waste handling, such as Waste Disposal Ordinance (Cap. 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354) and obtain all necessary permits where required; and</li> <li>Maintain records of waste generation and disposal quantities and disposal arrangements.</li> </ul> | <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> | <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> | <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> |
| <b>Ecological Impact (Construction)</b>           |  |   |   |   |
|   | No mitigation measure is required.   |   |   |   |
| <b>Landscape and Visual Impact (Construction)</b> |  |   |   |   |

| EM&A Ref.              | Recommendation Measures  | Implementation Stage |   |   |
|------------------------|--|----------------------|---|---|
|                        |  | M+ Museum            | L1  | L2  |
| Table 9.1 & 10.8 (CM1) | Trees should be retained in situ on site as far as possible. Should tree removal be unavoidable due to construction impacts, trees will be transplanted or felled with reference to the stated criteria in the Tree Removal Applications to be submitted to relevant government departments for approval in accordance to ETWB TCW No. 29/2004 and 3/2006. | ✓                    | ✓   | ✓   |
| Table 9.1 & 10.8 (CM2) | Compensatory tree planting shall be incorporated to the proposed project and maximize the new tree, shrubs and other vegetation planting to compensate tree felled and vegetation removed. Also, implementation of compensatory planting should be of a ratio not less than 1:1 in terms of quality and quantity within the site.                          | ✓                    | N/A<br>Compensatory tree planting is being reviewed.  | N/A<br>Compensatory tree planting is being reviewed.  |
| Table 9.1 & 10.8 (CM3) | Buffer trees for screening purposes to soften the hard architectural and engineering structures and facilities.  | ✓                    | N/A<br>Roof garden is designed to be built, but it has not been completed yet.  | N/A<br>Roof garden is designed to be built, but it has not been completed yet.  |
| Table 9.1 & 10.8 (CM4) | Softscape treatments such as vertical green wall panel /planting of climbing and/or weeping plants, etc, to maximize the green coverage and soften the hard architectural and engineering structures and facilities.   | ✓                    | N/A<br>Climbing or weeping plants are designed to be planted, but proposal is being reviewed for the planting location. | N/A<br>Climbing or weeping plants are designed to be planted, but proposal is being reviewed for the planting location. |
| Table 9.1 & 10.8 (CM5) | Roof greening by means of intensive and extensive green roof to maximize the green coverage and improve aesthetic appeal and visual quality of the building/structure.   | ✓                    | N/A<br>Roof garden is designed to be built, but it has not been completed yet.  | N/A<br>Roof garden is designed to be built, but it has not been completed yet.  |
| Table 9.1 & 10.8 (CM6) | Sensitive streetscape design should be incorporated along all new roads and streets.   | ✓                    | N/A<br>Greening along the seafront is proposed, but it has not been completed yet.                                      | N/A<br>Greening along the seafront is proposed, but it has not been completed yet.                                      |
| Table 9.1 & 10.8 (CM7) | Structure, ornamental planting shall be provided along amenity strips to enhance the landscape quality.  | ✓                    | N/A<br>Gardens are designed to be built, but it has not been completed yet.   | N/A<br>Gardens are designed to be built, but it has not been completed yet.   |

| EM&A Ref.               | Recommendation Measures  | Implementation Stage                             |  |  |
|-------------------------|--|--|--|--|
|                         |  | M+ Museum  | L1   | L2   |
| Table 9.1 & 10.8 (CM8)  | Landscape design shall be incorporated to architectural and engineering structures in order to provide aesthetically pleasing designs.             | ✓  | N/A<br>Roof garden is designed to be built, but it has not been completed yet. | N/A<br>Roof garden is designed to be built, but it has not been completed yet. |
| Table 9.1 (CM9)         | Minimize the structure of marine facilities to be built on the seabed and foreshore in order to minimize the affected extent to the waterbody      | N/A<br>No marine facilities for this project.    | N/A<br>No marine facilities for this project.                                  | N/A<br>No marine facilities for this project.                                  |
| Table 9.2 & 10.9 (MCP1) | Use of decorative screen hoarding/boards   | ✓  | ✓  | ✓  |
| Table 9.2 & 10.9 (MCP2) | Early introduction of landscape treatments   | ✓  | N/A<br>No landscape treatments during this stage.                              | N/A<br>No landscape treatments during this stage.                              |
| Table 9.2 & 10.9 (MCP3) | Adoption of light colour for the temporary ventilation shafts for the basement during the transition period.                                       | N/A<br>No ventilation shafts for this project.   | N/A<br>No ventilation shafts for this project.                                 | N/A<br>No ventilation shafts for this project.                                 |
| Table 9.2 & 10.9 (MCP4) | Control of night time lighting   | ✓  | ✓  | ✓  |
| Table 9.2 & 10.9 (MCP5) | Use of greenery such as grass cover for the temporary open areas will help achieve the visual balance and soften the hard edges of the structures. | N/A<br>No temporary open areas for this project. | N/A<br>No temporary open areas for this project.                               | N/A<br>No temporary open areas for this project.                               |

N/A - Not Applicable

✓ - Implemented

Obs - Observed

Rem - Reminder

## **K. Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions**

Cumulative statistics for complaints, notifications of summons and successful prosecutions for the Project account for period starting from the date of commencement of construction works (i.e. 31 October 2015 for M+ Museum main works and 1 March 2016 for Lyric Theatre Complex) to the end of the reporting month and are summarised in the **Table K-1** and **Table K-2** below respectively.

**Table K-1: Statistics for complaints, notifications of summons and successful prosecutions for M+ Museum Main Works**

| Reporting Period  | Cumulative Statistics |                          |                         |
|---|-----------------------|--------------------------|-------------------------|
|   | Complaints            | Notifications of summons | Successful prosecutions |
| This reporting month  | 1                     | 0                        | 0                       |
| From 31 October 2015 to end of the reporting month (Jan 2021) | 13                    | 1                        | 0                       |

**Table K-2: Statistics for complaints, notifications of summons and successful prosecutions for Lyric Theatre Complex**

| Reporting Period   | Cumulative Statistics |                          |                         |
|--|-----------------------|--------------------------|-------------------------|
|  | Complaints            | Notifications of summons | Successful prosecutions |
| This reporting month                                       | 1                     | 0                        | 0                       |
| From 1 March 2016 to end of the reporting month (Jan 2021) | 16                    | 0                        | 0                       |

# END OF PART-1

## **Part-2: EM&A for Foundation, Excavation and Lateral Works for Integrated Basement and Underground Road in Zone 2A**

# Foundation, Excavation and Lateral Works for Integrated Basement and Underground Road in Zone 2A

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The information supplied and contained within this report is, to the best of our knowledge, correct at time of printing



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K. Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

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# Executive summary

Apex Testing & Certification Limited (Apex) was commissioned to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for the construction activities in Zone 2A at WKCD, consisting of Foundation, Excavation and Lateral Support Works for Integrated Basement and Underground Road (Contract No.: GW/2020/05/073). The construction works and EM&A programme for Zone 2A commenced on 3 October 2020.

The Project Proponent is the West Kowloon Cultural District Authority (WKCDA). The overall works for the WKCD fall under two separate categories of Designated Project (DP) of the Environmental Impact Assessment Ordinance (EIAO), namely an “engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100 000” (Item 1 of Schedule 3) and “an underpass more than 100m in length under the built areas” (Item A.9, Part I, Schedule 2). An Environmental Permit No. EP-453/2013/B (EP) was issued with respect to the “Underpass Road and Austin Road Flyover Serving the West Kowloon Cultural District” which specifically includes the abovementioned category of DP under Item A.9, Part I, Schedule 2 of the EIAO.

This Monthly EM&A Report presents the monitoring works at Zone 2A from 1 to 31 January 2021.

## **Exceedance of Action and Limit Levels**

There was no breach of Action or Limit levels for Air Quality (1-hour TSP and 24-hour TSP) and Noise monitoring in this reporting month.

## **Implementation of Mitigation Measures**

Construction phase weekly site inspections were carried out on 7, 14, 21 and 28 January 2021 for Foundation, Excavation and Lateral Support Works in Zone 2A to confirm the implementation measures undertaken by the Contractors in the reporting month. The outcomes are presented in Section 4 and the status of implementation of mitigation measures in the site is shown in **Appendix J**.

Landscape and visual impact inspections were conducted as part of the abovementioned weekly site inspections during the reporting month. No adverse comment on landscape and visual aspects was made during these inspections.

## **Record of Complaints**

One environmental complaint was recorded in the reporting month

## **Record of Notifications of Summons and Successful Prosecutions**

No notifications of summons and successful prosecutions were recorded in the reporting month.

## **Future Key Issues**

The major site works for Zone 2A scheduled to be commissioned in the coming month include:

- Grouting Curtain Works (Trial 1 & Trial 2)
  - Trial Grouting (Trial 1 & Trial 2) – Stage 2 Grouting
- Bored Pile Works
  - Bored Pile Construction

- ELS (Stage 1)
  - Grouting Works
  - Pipe Pile Construction

Potential environmental impacts due to the construction activities, including air, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.

# 1 Introduction

## 1.1 Background

Apex Testing & Certification Limited (Apex) was commissioned to undertake the Environmental Team (ET) services (including environmental monitoring and audit (EM&A)) for the construction activities in Zone 2A at WKCD, consisting of Foundation, Excavation and Lateral Support Works for Integrated Basement and Underground Road (Contract No.: GW/2020/05/073). The purpose of the development in Zone 2A is to reserve for Integrated Basement (IB) and Underground Road (UR). The Zone 2A construction activities involve the foundation, excavation and lateral support (ELS) works, road works, drainage diversion works, and temporary car parking. The construction works and EM&A programme for Zone 2A commenced on 3 October 2020.

The overall works for the WKCD fall under two separate categories of Designated Project (DP) of the Environmental Impact Assessment Ordinance (EIAO), namely an “engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100 000” (Item 1 of Schedule 3) and “an underpass more than 100m in length under the built areas” (Item A.9, Part I, Schedule 2). An Environmental Permit No. EP-453/2013/B (EP) was issued with respect to the “Underpass Road and Austin Road Flyover Serving the West Kowloon Cultural District” which specifically includes the abovementioned category of DP under Item A.9, Part I, Schedule 2 of the EIAO. The captioned projects include part of the abovementioned underpass road located within the site boundary falls under this same category.

The Monthly EM&A Report is prepared in accordance with the Condition 3.4 of the Environmental Permit No. EP-453/2013/B. This Monthly EM&A Report presents the monitoring works at Zone 2A from 1 to 31 January 2021. The purpose of this report is to summarise the findings in the EM&A of the project over the reporting period.

## 1.2 Project Organisation

The organisation chart and lines of communication with respect to the on-site environmental management structure together with the contact information of the key personnel are shown in **Appendix A**.

## 1.3 Construction Works Status in the Reporting Period

During the reporting period, construction works at Zone 2A undertaken include:

- Grouting Curtain Works (Trial 1 & Trial 2)
  - Trial Grouting (Trial 1 & Trial 2) – Stage 2 Grouting
- Bored Pile Works
  - Bored Pile Construction
- ELS (Stage 1)
  - Grouting Works
  - Pipe Pile Construction

The Construction Works Programme of Zone 2A is provided in **Appendix B**. A layout plan of the Project is provided in **Figure 1**. Please refer to **Table 4.2** on the status of the environmental licenses.

## 1.4 Summary of EM&A Requirements and Alternative Monitoring Locations

### 1.4.1 Summary of EM&A Requirements

The EM&A programme requires environmental monitoring of air quality, noise, landscape and visual as specified in the approved EM&A Manual.

A summary of impact EM&A requirements is presented in **Table 1.1**.

**Table 1.1: Summary of Impact EM&A Requirements**

| Parameters         | Descriptions   | Locations  | Frequencies                   |
|--------------------|--|--|-------------------------------|
| Air Quality        | 24-Hours TSP   | AM3-The Victoria Towers Tower 1                        | At least once every 6 days    |
|                    | 1-Hour TSP   | AM3-The Victoria Towers Tower 1                        | At least 3 times every 6 days |
|                    | 24-Hours TSP   | AM4-Canton Road Government Primary School              | At least once every 6 days    |
|                    | 1-Hour TSP   | AM4-Canton Road Government Primary School              | At least 3 times every 6 days |
|                    | 24-Hours TSP   | AM5-Topside Developments at West Kowloon Terminus Site | At least once every 6 days    |
|                    | 1-Hour TSP   | AM5-Topside Developments at West Kowloon Terminus Site | At least 3 times every 6 days |
| Noise              | Leq, 30 minutes  | NM2-The Arch, Sun Tower                                | Weekly                        |
|                    | Leq, 30 minutes  | NM3-The Victoria Towers Tower 1                        | Weekly                        |
|                    | Leq, 30 minutes  | NM4-Canton Road Government Primary School              | Weekly                        |
|                    | Leq, 30 minutes  | NM5-Development next to Austin Station                 | Weekly                        |
| Landscape & Visual | Monitor implementation of proposed mitigation measures during the construction stage | As described in Table 9.1 and 9.2 of the EM&A Manual   | Bi-Weekly                     |

### 1.4.2 Alternative Monitoring Locations

The EM&A programme for the Project should require 5 noise monitoring station and 5 air quality monitoring stations located closest to the Project area. With regard to the monitoring activities at M+ Museum and the Lyric Complex, three monitoring stations had been considered, including AM1 (International Commerce Centre), AM2 (The Harbourside Tower 1) for air monitoring, and NM1 (The Harbourside Tower 1) for noise monitoring.

In the context of the construction activities in Zone 2A, all other monitoring locations including AM3 (The Victoria Towers Tower 1), AM4 (Canton Road Government Primary School), and AM5 (Topside Developments at West Kowloon Terminus Site) for air monitoring; and NM2 (The Arch, Sun Tower), NM3 (The Victoria Towers Tower 1), NM4 (Canton Road Government Primary School) and NM5 (Development next to Austin Station) for noise monitoring, have been taken

into account. However, access to all these originally designated monitoring stations was declined as described below point-by-point.

The Arch management office and owners' committee have formally declined the proposal of setting up noise monitoring instrument on its premises at the podium level of Sun Tower (NM2) on 24 July 2014. Thus, alternative noise monitoring location was identified at the ground floor in front of The Arch – Sun Tower (NM2A), which is at the same location as stated in the EM&A Manual for consistency. No management approval is required at the ground floor for conducting the noise monitoring. This alternative air monitoring location was approved by EPD on 29 September 2020.

The Victoria Towers management office formally declined the proposal of setting up air quality and noise monitoring instruments on its premises at the podium area of Tower 1 (AM3/NM3) on 16 June 2020. Alternative air monitoring location was identified at ground floor at the Northeast corner of West Kowloon Station's station box (AM3A), in the same direction to the area of major construction site activities in Zone 2A. This alternative air monitoring location was approved by EPD on 29 September 2020. An alternative noise monitoring location was identified at the ground floor in front of the Xiqu Centre (NM3A), which is set closer to the construction site boundary with more direct line sight to the major site activities and higher exposure to the construction noise with no disturbance to the premises' occupants during noise monitoring activities. No management approval is required at the ground floor for conducting the noise monitoring. This alternative air monitoring location was approved by EPD on 29 September 2020.

Canton Road Government Primary School formally declined the proposal of setting up air quality and noise monitoring instruments on its premise at the podium level (AM4/NM4) on 16 June 2020. Alternative air monitoring location was identified at ground floor at the Southeast corner of West Kowloon Station's station box (AM4A), in same direction to the area of major construction site activities in Zone 2A. This alternative air monitoring location was approved by EPD on 29 September 2020. An alternative noise monitoring location was identified at the ground floor next to Tsim Sha Tsui Fire Station (NM4A), which is set closer to the construction site boundary with more direct line sight to the major site activities and higher exposure to the construction noise with no disturbance to the premises' occupants during noise monitoring activities. No management approval is required at the ground floor for conducting the noise monitoring. This alternative air monitoring location was approved by EPD on 29 September 2020.

MTR also formally declined the access to the designated AM5 location (topside developments at West Kowloon Terminus Site) on 15 July 2020. Alternative air monitoring location was identified at ground floor at the North of West Kowloon Station's station box (AM5A), in same direction to the area of major construction site activities in Zone 2A. This alternative air monitoring location was approved by EPD on 29 September 2020.

Grand Austin property management office formally declined our proposal of setting up noise monitoring instrument on its premises at the podium level (NM5) on 10 July 2020. Alternative noise monitoring location was identified at the Pedestrian road (ground floor) outside West Kowloon Station (NM5A), which is set closer to the construction site boundary with more direct line sight to the major site activities and higher exposure to the construction noise with no disturbance to the premises' occupants during noise monitoring activities. No management approval is required at the ground floor for conducting the noise monitoring. This alternative air monitoring location was approved by EPD on 29 September 2020.



The Environmental Quality Performance Limits for air quality and noise are shown in **Appendix C**.

The Event and Action Plan for air quality, construction noise, and landscape and visual are shown in **Appendix D**.

The EM&A programme followed the recommended mitigation measures in the EM&A Manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in **Appendix J**.

## 2 Impact Monitoring Methodology

### 2.1 Introduction

Air quality and noise monitoring methodology, including the monitoring locations, equipment used, parameters, frequency and duration etc., are described in this Section. The environmental monitoring schedules for the reporting period and the tentative monitoring Schedule for the coming month are provided in **Appendix E**.

The relevant EM&A monitoring requirements and details for landscape and audit impact, are also presented in this Section.

### 2.2 Air Quality

#### 2.2.1 Monitoring Parameters, Frequency and Duration

**Table 2.1** summarizes the monitoring parameters, frequency and duration of the TSP monitoring.

**Table 2.1: Air Quality Monitoring Parameters, Frequency and Duration**

| Parameter   | Frequency                       | Duration   |
|-------------|---------------------------------|------------|
| 24-hour TSP | At least once in every six-days | 24 hours   |
| 1-hour TSP  | At least 3 times every six-days | 60 minutes |

#### 2.2.2 Monitoring Locations

Monitoring stations and locations are given in **Table 2.2** and shown in **Figure 1**.

**Table 2.2: Air Quality Monitoring Station**

| Monitoring Station | Location Description   |
|--------------------|--|
| AM3A               | Northeast corner of West Kowloon Station's station box (G/F) |
| AM4A               | Southeast corner of West Kowloon Station's station box (G/F) |
| AM5A               | North of West Kowloon Station's station box (G/F)            |

#### 2.2.3 Monitoring Equipment

Continuous 24-hour TSP air quality monitoring was conducted using High Volume Sampler (HVS) (Model: TE-5170) located at the designated monitoring station. The HVS meets all the requirements stated in of the EM&A Manual. Portable direct reading dust meter was used to carry out the 1-hour TSP monitoring. **Table 2.3** summarizes the equipment used in the impact air quality monitoring. Copies of the calibration certificates for the HVS, calibration kit and portable dust meters are attached in **Appendix F**.

**Table 2.3: TSP Monitoring Equipment**

| Equipment                     | Model                                  |
|-------------------------------|--|
| <b>24-hour TSP monitoring</b> |  |
| High Volume Sampler           | TE-5170 (Serial No.: 4340; 3998; 4344) |
| Calibrator                    | TE-5025A (Orifice I.D.: 3543)          |

| Equipment                          | Model   |
|------------------------------------|---|
| <b>1-hour TSP monitoring</b>       |   |
| Portable direct reading dust meter | Sibata LD-3B (Serial No.: 235811, 336338, 567188) |

Calibration of the HVS (five-point calibration) using Calibration Kit was carried out every two months. The HVS calibration orifice will be calibrated annually. Calibration certificate of the TE-5025A Calibration Kit and the HVS are provided in **Appendix F**.

The 1-hour TSP monitoring should be determined periodically (e.g. annually) by the HVS to check the validity and accuracy of the results measured by direct reading method.

## 2.2.4 Monitoring Methodology

### **24-hour TSP Monitoring**

#### **Installation**

The HVS was installed at the site boundary. The following criteria were considered in the installation of the HVS.

- A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
- The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
- A minimum of 2 metres separation from walls, parapets and penthouse was required for rooftop sampler.
- A minimum of 2 metres separation from any supporting structure, measured horizontally was required.
- No furnace or incinerator flues or building vent were nearby.
- Airflow around the sampler was unrestricted.
- The sampler has been more than 20 metres from any drip line.
- Permission was obtained to set up the sampler and to obtain access to the monitoring station.
- A secured supply of electricity is needed to operate the sampler.

#### **Preparation of Filter Papers**

- Glass fibre filters were labelled and sufficient filters that were clean and without pinholes were selected.
- The filters used are specified to have a minimum collection efficiency of 99 percent for 0.3 µm (DOP) particles.
- All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C with relative humidity (RH) < 50% and was not variable by more than ±5 %. A convenient working RH was 40%. All preparation of filters was done by Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory.

#### **Field Monitoring Procedures**

- The power supply was checked to ensure the HVS works properly.
- The filter holder and the area surrounding the filter were cleaned.
- The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.

- The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
- The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges.
- The shelter lid was closed and was secured with the aluminium strip.
- The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
- A new flow rate record sheet was set into the flow recorder.
- The flow rate of the HVS was checked and adjusted at around 1.3 m<sup>3</sup>/min. The range specified in the EM&A Manual was between 0.6-1.7 m<sup>3</sup>/min.
- The programmable timer was set for a sampling period of 24 hours, and the starting time, weather condition and the filter number were recorded.
- The initial elapsed time was recorded.
- At the end of sampling, the sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
- It was then placed in a clean plastic envelope and sealed.
- All monitoring information was recorded on a standard data sheet.
- Filters were sent to a Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory for analysis.

### **Maintenance and Calibration**

- The HVS and its accessories are maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
- HVSs were calibrated upon installation and thereafter at bi-monthly intervals. The calibration kits were calibrated annually.
- Calibration records for HVS and calibration kit are shown in **Appendix F**.

### **1-hour TSP Monitoring**

#### **Field Monitoring**

The measuring procedures of the 1-hour dust meter are in accordance with the Manufacturer's Instruction Manual as follows:

- Turn the power on.
- Close the air collecting opening cover.
- Push the "TIME SETTING" switch to [BG].
- Push "START/STOP" switch to perform background measurement for 6 seconds.
- Turn the knob at SENSI ADJ position to insert the light scattering plate.
- Leave the equipment for 1 minute upon "SPAN CHECK" is indicated in the display.
- Push "START/STOP" switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.
- Pull out the knob and return it to MEASURE position.
- Setting time period of 1 hour for the 1-hour TSP measurement.
- Push "START/STOP" to start the 1-hour TSP measurement.
- Regular checking of the time period setting to ensure monitoring time of 1 hour.

### **Maintenance and Calibration**

- The 1-hour dust meter would be checked at 3-month intervals and calibrated at 1-year intervals throughout all stages of the air quality monitoring.
- Calibration records for direct dust meters are shown in **Appendix F**.

## Weather Condition

- Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix H**.

## 2.3 Noise

### 2.3.1 Monitoring Parameters, Frequency and Duration

**Table 2.4** summarizes the monitoring parameters, frequency and duration of noise monitoring. The noise in A-weighted levels  $L_{eq}$ ,  $L_{10}$  and  $L_{90}$  are recorded in a 30-minute interval between 0700 and 1900 hours.

**Table 2.4: Noise Monitoring Parameters, Period and Frequency**

| Time Period                                     | Parameters   | Frequency       |
|---|--|-----------------|
| Daytime on normal weekdays<br>(0700-1900 hours) | $L_{eq}$ (30 min), $L_{90}$ (30 min) & $L_{10}$ (30 min) | Once every week |

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

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

### 2.3.2 Monitoring Location

Noise monitoring stations and locations are given in **Table 2.5** and shown in **Figure 1**.

**Table 2.5: Noise Monitoring Station**

| Monitoring Station | Location   |
|--------------------|--|
| NM2A               | The Arch – Sun Tower (G/F)                         |
| NM3A               | Xiqu Centre (G/F)                                  |
| NM4A               | Next to Tsim Sha Tsui Fire Station (G/F)           |
| NM5A               | Pedestrian road (G/F) outside West Kowloon Station |

### 2.3.3 Monitoring Equipment

Integrating Sound Level Meter was used for noise monitoring. It was a Type 1 sound level meter capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level ( $L_{Aeq}$ ) and percentile sound pressure level ( $L_x$ ). They comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). **Table 2.6** summarizes the noise monitoring equipment model being used.

**Table 2.6: Noise Monitoring Equipment**

| Equipment Model               |                                  |
|-------------------------------|----------------------------------|
| Integrating Sound Level Meter | Calibrator                       |
| AWA5661 (Serial No.: 301135)  | Pulsar 100B (Serial No.: 039507) |

### 2.3.4 Monitoring Methodology

#### Field Monitoring

- The microphone of the Sound Level Meter was set at least 1.2 m above the ground.
- Free Field measurement was made at NM5A monitoring location.
- The battery condition was checked to ensure the correct functioning of the meter.

- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
  - frequency weighting: A
  - time weighting: Fast
  - time measurement: 30 minutes intervals (between 0700-1900 on normal weekdays)
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1 kHz. If the difference in the calibration level before and after measurement was more than 1 dB, the measurement would be considered invalid and has to be repeated after re-calibration or repair of the equipment.
- During the monitoring period, the  $L_{eq}$ ,  $L_{10}$  and  $L_{90}$  were recorded. In addition, any site observations and noise sources were recorded on a standard record sheet.
- A correction of +3dB(A) was made to the free field measurements.

### Maintenance and Calibration

- The microphone head of the sound level meter and calibrator is cleaned with soft cloth at quarterly intervals.
- The sound level meter and calibrator are sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.
- Calibration records are shown in **Appendix F**.

### Weather Condition

- Meteorological data extracted from Hong Kong Observatory for the reporting month is provided in **Appendix H**.

## 2.4 Landscape and Visual

### 2.4.1 Monitoring Program

**Table 2.7** details the monitoring program (as proposed in the WKCD EIA report) for landscape and visual impact during the construction phase.

**Table 2.7: Monitoring Program for Landscape and Visual Impact during Construction Phase**

| Stage        | Monitoring Task   | Frequency | Report                                  | Approval              |
|--------------|---|-----------|---|-----------------------|
| Construction | Monitor implementation of proposed mitigation measures during the construction stage. | Bi-weekly | ET to report on Contractor's compliance | Counter-signed by IEC |

During the landscape and visual impact monitoring, any changes in relation to the landscape and visual amenity should be monitored with reference to the baseline conditions of the site. In addition, mitigation measures were proposed in the WKCD EIA report to minimise the landscape and visual impacts during the construction phase. The proposed mitigation measures as shown in Table 9.1 and Table 9.2 of the EM&A Manual should be checked for proper implementation.

## 3 Monitoring Results

### 3.1 Impact Monitoring

Air quality, noise and landscape and visual impact monitoring was undertaken in compliance with the EM&A Manual during the reporting month.

### 3.2 Air Quality Monitoring

#### 3.2.1 1-hour TSP

Results of 1-hour TSP are summarised in **Table 3.1**. Graphical plots of the monitoring results are shown in **Appendix G**.

**Table 3.1: Summary of 1-hour TSP monitoring results**

| Monitoring Station | Monitoring Date | Start Time | 1-hour TSP ( $\mu\text{g}/\text{m}^3$ ) |            |            | Range ( $\mu\text{g}/\text{m}^3$ ) | Action Level ( $\mu\text{g}/\text{m}^3$ ) | Limit Level ( $\mu\text{g}/\text{m}^3$ ) |
|--------------------|-----------------|------------|---|------------|------------|------------------------------------|---|--|
|                    |                 |            | 1st Result                              | 2nd Result | 3rd Result |                                    |   |  |
| AM3A               | 02-Jan-21       | 8:31       | 51                                      | 43         | 46         | 43-71                              | 280.4                                     | 500                                      |
|                    | 08-Jan-21       | 14:22      | 48                                      | 45         | 50         |                                    |   |  |
|                    | 14-Jan-21       | 8:27       | 69                                      | 66         | 71         |                                    |   |  |
|                    | 20-Jan-21       | 14:08      | 53                                      | 57         | 51         |                                    |   |  |
|                    | 26-Jan-21       | 8:20       | 61                                      | 66         | 59         |                                    |   |  |
| AM4A               | 02-Jan-21       | 8:39       | 44                                      | 48         | 50         | 44-74                              | 278.5                                     | 500                                      |
|                    | 08-Jan-21       | 14:30      | 53                                      | 55         | 47         |                                    |   |  |
|                    | 14-Jan-21       | 8:35       | 65                                      | 72         | 74         |                                    |   |  |
|                    | 20-Jan-21       | 14:16      | 50                                      | 55         | 58         |                                    |   |  |
|                    | 26-Jan-21       | 8:28       | 57                                      | 62         | 65         |                                    |   |  |
| AM5A               | 02-Jan-21       | 8:54       | 49                                      | 45         | 43         | 43-75                              | 275.4                                     | 500                                      |
|                    | 08-Jan-21       | 14:47      | 49                                      | 51         | 54         |                                    |   |  |
|                    | 14-Jan-21       | 8:50       | 71                                      | 75         | 73         |                                    |   |  |
|                    | 20-Jan-21       | 14:33      | 56                                      | 48         | 53         |                                    |   |  |
|                    | 26-Jan-21       | 8:43       | 64                                      | 61         | 67         |                                    |   |  |

#### 3.2.2 24-hour TSP

Results of 24-hour TSP are summarised in **Table 3.2**. Graphical plots of the monitoring results are shown in **Appendix G**.

**Table 3.2: Summary of 24-hour TSP monitoring results**

| Monitoring Station | Monitoring Date | Start Time | Monitoring Results ( $\mu\text{g}/\text{m}^3$ ) | Range ( $\mu\text{g}/\text{m}^3$ ) | Action Level ( $\mu\text{g}/\text{m}^3$ ) | Limit Level ( $\mu\text{g}/\text{m}^3$ ) |
|--------------------|-----------------|------------|---|------------------------------------|---|--|
| AM3A               | 02-Jan-21       | 10:00      | 42.2  | 42.2-64.8                          | 152.4                                     | 260                                      |
|                    | 08-Jan-21       | 10:00      | 43.2  |                                    |   |  |
|                    | 14-Jan-21       | 10:00      | 64.8  |                                    |   |  |
|                    | 20-Jan-21       | 10:00      | 52.3  |                                    |   |  |

| Monitoring Station | Monitoring Date | Start Time | Monitoring Results ( $\mu\text{g}/\text{m}^3$ ) | Range ( $\mu\text{g}/\text{m}^3$ ) | Action Level ( $\mu\text{g}/\text{m}^3$ ) | Limit Level ( $\mu\text{g}/\text{m}^3$ ) |
|--------------------|-----------------|------------|---|------------------------------------|---|--|
| AM4A               | 26-Jan-21       | 10:00      | 56.3  | 45.6-67.1                          | 152.6                                     | 260                                      |
|                    | 02-Jan-21       | 10:00      | 45.6  |                                    |   |  |
|                    | 08-Jan-21       | 10:00      | 47.5  |                                    |   |  |
|                    | 14-Jan-21       | 10:00      | 67.1  |                                    |   |  |
|                    | 20-Jan-21       | 10:00      | 47.9  |                                    |   |  |
|                    | 26-Jan-21       | 10:00      | 56.8  |                                    |   |  |
| AM5A               | 02-Jan-21       | 10:00      | 46.6  | 46.6-73.7                          | 141.1                                     | 260                                      |
|                    | 08-Jan-21       | 10:00      | 47.7  |                                    |   |  |
|                    | 14-Jan-21       | 10:00      | 73.7  |                                    |   |  |
|                    | 20-Jan-21       | 10:00      | 48.2  |                                    |   |  |
|                    | 26-Jan-21       | 10:00      | 58.4  |                                    |   |  |

No exceedance of 1-hour and 24-hour TSP (Action or Limit Level) was recorded in the reporting period.

### 3.3 Noise Monitoring

The construction noise monitoring results are summarized in **Table 3.3**. Graphical plots of the monitoring data and the station set-up as façade and free-field measurements are shown in **Appendix G**.

**Table 3.3: Summary of noise monitoring results during normal weekdays**

| Monitoring Stations | Monitoring Date | Start Time | End Time | $L_{eq}$ (30 mins) dB(A) | Limit Level for $L_{eq}$ (dB(A)) |
|---------------------|-----------------|------------|----------|--------------------------|----------------------------------|
| NM2A                | 02-Jan-21       | 08:31      | 09:01    | 63.2                     | 75                               |
|                     | 08-Jan-21       | 14:22      | 14:52    | 63.9                     |                                  |
|                     | 14-Jan-21       | 08:27      | 08:57    | 64.2                     |                                  |
|                     | 20-Jan-21       | 14:08      | 14:38    | 64.5                     |                                  |
|                     | 26-Jan-21       | 08:20      | 08:50    | 64.1                     |                                  |
| NM3A                | 02-Jan-21       | 10:01      | 10:31    | 73.6                     | 75                               |
|                     | 08-Jan-21       | 15:55      | 16:25    | 74.1                     |                                  |
|                     | 14-Jan-21       | 09:57      | 10:27    | 73.7                     |                                  |
|                     | 20-Jan-21       | 15:41      | 16:11    | 71.2                     |                                  |
|                     | 26-Jan-21       | 09:50      | 10:20    | 70.5                     |                                  |
| NM4A                | 02-Jan-21       | 10:36      | 11:06    | 69.0                     | 70/65 <sup>^</sup>               |
|                     | 08-Jan-21       | 16:30      | 17:00    | 69.1                     |                                  |
|                     | 14-Jan-21       | 10:32      | 11:02    | 67.8                     |                                  |
|                     | 20-Jan-21       | 16:16      | 16:46    | 64.0                     |                                  |
|                     | 26-Jan-21       | 10:25      | 10:55    | 64.2                     |                                  |
| NM5A*               | 02-Jan-21       | 09:21      | 09:51    | 65.2                     | 75                               |
|                     | 08-Jan-21       | 15:14      | 15:44    | 64.6                     |                                  |
|                     | 14-Jan-21       | 09:17      | 09:47    | 65.7                     |                                  |
|                     | 20-Jan-21       | 15:00      | 15:30    | 65.0                     |                                  |
|                     | 26-Jan-21       | 09:10      | 09:40    | 64.5                     |                                  |

Remarks:

\* +3dB (A) correction was applied to free-field measurement.



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<sup>^</sup> 70 dB(A) for schools and 65 dB(A) during school examination periods.

<sup>#</sup> School examination was conducted on 20 and 26 January 2021 during the reporting period.

No exceedance (Action/Limit Level) of construction noise was recorded in the reporting period.

Construction works were extended to 1900-2300 hours on 2 January, 4 to 9 January, 11 to 16 January, 18 to 23 January, and 25-30 January 2021 and to holidays on 3, and 24 January 2021. In accordance with the EM&A Manual, additional monitoring was carried out during the restricted hours on 2, 3, 8, 14, 20, 24 and 26 January 2021. The  $L_{eq}$  (5 mins) is in the range of 53.6-69.9 dB(A). Construction Noise Permits for the works carried out during restricted hours were obtained and listed in **Table 4.2**.

One noise related environmental complaint (which was documented and found not related to Zone 2A construction activities) was received during the reporting period. The noise levels recorded during the monitoring period were below the limit level.

### 3.4 Landscape and Visual Impact

Landscape and visual impact inspections were conducted as part of the weekly site inspections on 07 and 21 January 2021 for Zone 2A during the reporting month. As reviewed by the registered Landscape Architect, no adverse comment on landscape and visual aspects was made during these inspections.

The landscape and visual mitigation measures were implemented during the reporting period. The summary of implementation status of the environmental mitigation measures is provided in **Appendix J**.

## 4 Site Environmental Management

### 4.1 Site Inspection

Construction phase weekly site inspections were carried out on 7, 14, 21 and 28 January 2021. The joint site inspection with IEC, ET, ER and Contractor was held on 14 January 2021. All observations have been recorded in the site inspection checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary. The key observations from the site inspections and associated recommendations are summarized in **Table 4.1**.

**Table 4.1: Summary of Site Inspections and Recommendations for Zone 2A**

| Inspection Date | Parameter     | Observation / Recommendation  | Contractor's Responses / Action(s) Undertaken   | Close-out (Date) |
|-----------------|---------------|---|---|------------------|
| 07-Jan-21       | Water Quality | The contractor was reminded to provide drainage facility to pump the water away to the treatment facility.                | The contractor has provided drainage facility.  | 13-Jan-21        |
| 07-Jan-21       | Noise         | Noise barriers were suggested to cover the plant as far as possible.  | The contractor has provided more noise barriers to cover the plant as far as possible minimise construction noise impact. | 08-Jan-21        |
| 14-Jan-21       | Air Quality   | Dusty haul road was observed. Contractor was reminded to implement more frequent dust suppression measures.               | The contractor has sprayed water on road regularly to suppress dust.  | 14-Jan-21        |
| 14-Jan-21       | Water Quality | The contractor was reminded to provide sufficient prevention measures to prevent muddy water direct discharge to the sea. | The contractor has provided barrier to prevent muddy water direct discharge to the sea.                                   | 18-Jan-21        |
| 21-Jan-21       | Air Quality   | The contractor was reminded to check / maintain the plants regularly to minimise generation of dark smoke emission.       | The contractor has checked the plant and changed the diesel filter to minimise generation of dark smoke emission.         | 21-Jan-21        |
| 21-Jan-21       | Water Quality | The contractor was reminded to clean the U-channel regularly.   | The contractor has cleaned the U-channel.   | 22-Jan-21        |
| 21-Jan-21       | Noise         | Noise barriers were suggested to set at proper direction to minimise noise impact to the nearby noise sensitive receiver. | The contractor has set the noise barrier at direction facing the nearby noise sensitive receiver.                         | 21-Jan-21        |
| 28-Jan-21       | Air Quality   | The contractor was reminded to check / maintain the plants regularly to minimise generation of dark smoke emission.       | The contractor has checked the plant and changed the diesel filter to minimise generation of dark smoke emission.         | 28-Jan-21        |
| 28-Jan-21       | Water Quality | The contractor was suggested to provide higher bunding near the U-channel.  | The contractor has provided higher soil bunding to prevent materials washed into the U-channel.                           | 30-Jan-21        |

| Inspection Date | Parameter | Observation / Recommendation  | Contractor's Responses / Action(s) Undertaken   | Close-out (Date) |
|-----------------|-----------|---|---|------------------|
| 28-Jan-21       | Noise     | Noise barriers were suggested to set at proper direction to minimise noise impact to the nearby noise sensitive receiver. | The contractor has set the noise barrier at direction facing the nearby noise sensitive receiver. | 30-Jan-21        |

## 4.2 Advice on the Solid and Liquid Waste Management Status

The Contractors have been registered as a chemical waste producer for the Project. Construction and demolition (C&D) material sorting will be carried out on site. A sufficient number of receptacles were available for general refuse collection.

As advised by the Contractor, 215.99 tonnes, 6580.77 tonnes of inert C&D material were disposed of as public fill to Tseung Kwan O Area 137 Public Fill, and Tuen Mun Area 38 Public Fill respectively, while 18.94 tonnes and 1.00 tonne of general refuse were disposed of at SENT landfill and WENT landfill. 0.0 tonne of metals, 0.0 tonne of paper/cardboard packaging, 0.0 tonne of plastics and 0.0 tonne of timber was collected by recycling contractors in the reporting month. 52.90 tonnes of inert C&D material were reused on site. 0.0 tonne of inert C&D material were reused in other projects and 0.0 tonnes of inert C&D material was imported for reuse at site in the reporting month. 0.0 tonne of inert C&D material was disposed to sorting facility and 0.0 tonne of chemical waste was collected by licensed contractors in the reporting period.

The cumulative waste generation records for Zone 2A are shown in **Appendix I**.

## 4.3 Status of Environmental Licenses and Permits

The environmental permits, licenses, and/or notifications on environmental protection for this Project which were valid during the period are summarised in **Table 4.2**.

**Table 4.2: Status of Environmental Submissions, Licenses and Permits for Zone 2A**

| Permit / License<br>No.<br>/ Notification /<br>Reference No.            | Valid Period |           | Status                           | Remarks      |
|---|--------------|-----------|----------------------------------|--------------|
|   | From         | To        |                                  |              |
| Chemical Waste Producer Registration                                    |              |           |                                  |              |
| WPN5113-256-<br>B2597-01  | 10-Sep-20    | --        | Valid                            | --           |
| Billing Account Construction Waste Disposal                             |              |           |                                  |              |
| 7037500   | 09-Jun-20    | --        | Account Active                   | --           |
| Construction Noise Permit   |              |           |                                  |              |
| GW-RE-1040-20   | 11-Dec-20    | 10-Jan-21 | Valid in the<br>reporting period | Piling Works |
| GW-RE-0006-21   | 11- Jan-21   | 10-Mar-21 | Valid                            | Piling Works |
| Wastewater Discharge License  |              |           |                                  |              |
| 457581  | --           | --        | Under EPD<br>Approval            | --           |
| Notification under Air Pollution Control (Construction Dust) Regulation |              |           |                                  |              |
| 456376  | 21-May-20    | --        | Notified                         | --           |
| Permit to Dump Material at sea under Dumping at Sea Ordinance           |              |           |                                  |              |
| 461895  | --           | --        | Under EPD<br>Approval            | --           |

#### 4.4 Recommended Mitigation Measures

The EM&A programme followed the recommended mitigation measures in the EM&A Manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in **Appendix J**. In particular, the following mitigation measures were brought to attention during the site inspections:

##### **Air Quality**

- Maintain water spraying for active construction area and main haul road.
- Check / maintain the plants regularly to minimise generation of dark smoke emission.

##### **Noise Control**

- Provide more noise barrier to cover the plant as far as possible to minimise construction noise impact.
- Noise barrier shall be set at proper direction to minimise noise impact to the nearby noise sensitive receiver.

##### **Temporary Water Drainage System & Water Quality**

- The temporary drainage system should be updated with the site condition.
- U-channel should be cleaned regularly.
- The water treatment facilities should be cleaned regularly to maintain proper function.
- Barrier should be provided to avoid muddy water flow out from the working area.
- Higher bunding shall be provided near the U-channel to prevent the washing away of materials into any drainage system.

## 5 Compliance with Environmental Permit

The status of the required submission under the EP during the reporting period is summarized in **Table 5.1**.

**Table 5.1: Status of Submissions under the Environmental Permit**

| EP Condition  | Submission                            | Submission Date |
|---------------|---------------------------------------|-----------------|
| Condition 3.4 | Monthly EM&A Report for December 2020 | 14 January 2021 |

## 6 Report in Non-compliance, Complaints, Notification of Summons and Successful Prosecutions

### 6.1 Record on Non-compliance of Action and Limit Levels

There was no breach of Action or Limit levels for Air Quality (1-hour TSP and 24-hour TSP) and Noise monitoring in this reporting month (the noise related environmental complaint received in the reporting month was not related to Zone 2A construction site).

### 6.2 Record on Environmental Complaints Received

One environmental complaint was recorded in the reporting month.

On 27 January 2021, WKCD has received an enquiry from the office of Mr. Derek Hung (YTMDC member) about the noise from WKCD site. A resident from The Harbourside, who has reflected the noise problem since March 2020, expressed that he/she has been affected by the construction noise around 7:15 am on 27 January 2021. The resident understood that the working hours permitted by government is 7am-7pm, except public holidays. However, he/she would like to seek if we could reduce noise disturbance, especially before 9am.

After investigation and analysis of the complaint video sent by the complainant on 27 January 2021, it appeared that, no construction works were formally carried out in Zone 2A site in the morning over 07:00-07:30 am. Moreover, the noise control measures have been enhanced on site (via trainings, noise barrier erection, noise measurement and monitoring with no exceedance, and promotional activities). Thus, the complaint could not be attributable to Zone 2A. However, the Contractor is recommended to enhance the site management and noise control. The Contractor is also recommended to maintain on-site noise control measures in order to minimize disturbance to site neighbors.

The cumulative statistics on complaints were provided in **Appendix K**.

### 6.3 Record on Notifications of Summons and Successful Prosecution

No notifications of summons or successful prosecutions were received this month. The cumulative statistics on notifications of summons and successful prosecutions were provided in **Appendix K**.

## 7 Future Key Issues

### 7.1 Construction Works for the Coming Month(s)

- Grouting Curtain Works (Trial 1 & Trial 2)
  - Trial Grouting (Trial 1 & Trial 2)
- Bored Pile Works
  - Bored Pile Construction
- ELS (Stage 1)
  - King Post
  - Grouting Works
  - Pipe Pile Construction

### 7.2 Key Issues for the Coming Month

Key issues to be considered in the coming month include:

- Generation of dust from construction works;
- Noise impact from piling works;
- Generation of site surface runoffs and wastewater from activities on-site;
- Management of stockpiles and slopes, particularly on rainy days;
- Sorting, recycling, storage and disposal of general refuse and construction waste; and
- Management of chemicals and avoidance of oil spillage on-site.

### 7.3 Monitoring Schedule for the Coming Month

The environmental site inspection and environmental monitoring will be continued in the coming month. Impact monitoring for air quality and noise in accordance with the approved EM&A Manual has commenced since 3 October 2020 for Zone 2A. The tentative monitoring schedule for the coming month is shown in the **Appendix E**.

## 8 Conclusions and Recommendations

### 8.1 Conclusions

The EM&A programme as recommended in the EM&A Manual has been undertaken with the commencement of the construction activities at Zone 2A on 3 October 2020.

Monitoring of air quality and noise with respect to the Projects is underway. In particular, the 1-hour TSP, 24-hour TSP, noise level (as  $L_{eq}$ , 30 minutes) under monitoring have been checked against established Action and Limit levels. There was no breach of Action or Limit levels for Air Quality (1-hour TSP and 24-hour TSP) and Noise monitoring in this reporting month.

One environmental complaint was recorded in the reporting month. No notifications of summons or successful prosecutions were received during the reporting month.

Weekly construction phase site inspections and bi-weekly landscape and visual impact inspections were conducted during the reporting month as required. It was observed that the Contractors had implemented all possible and feasible mitigation measures to mitigate the potential environmental impacts during construction phase works.

### 8.2 Recommendations

Potential environmental impacts due to the construction activities, including air quality, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.



## **Figure 1     Site Layout Plan and Monitoring Stations**

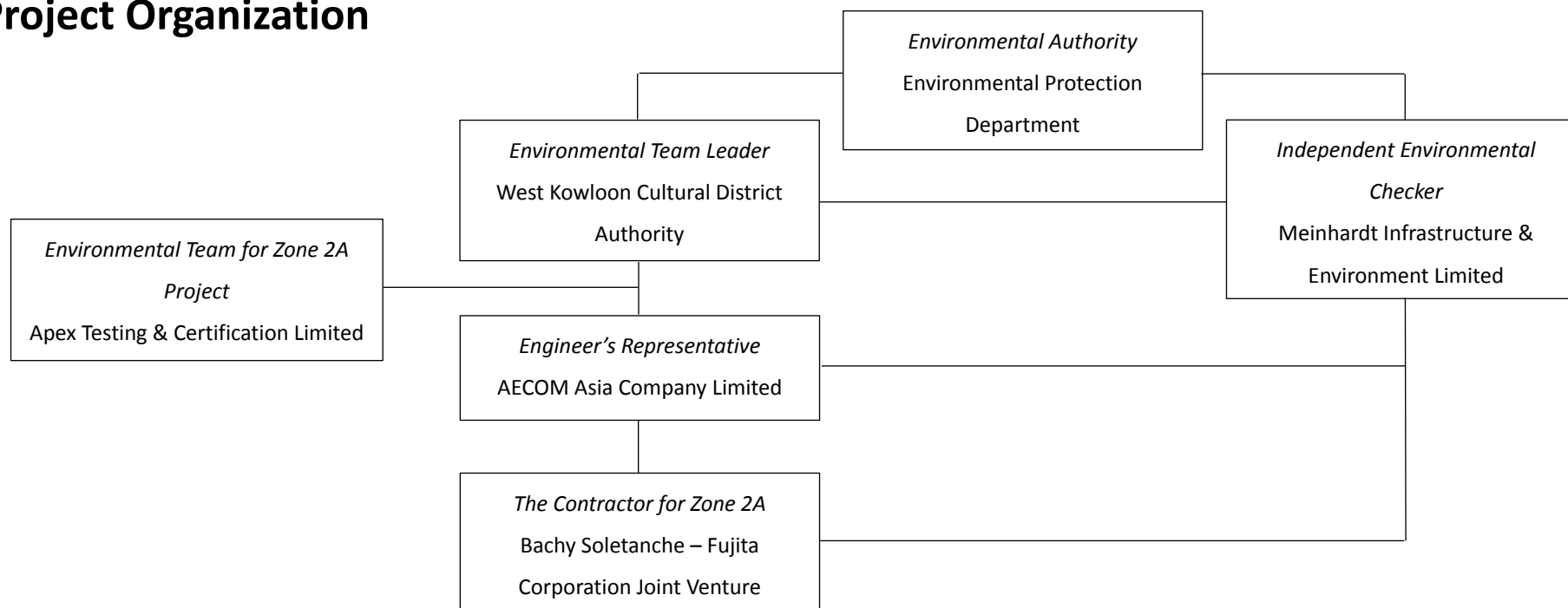


# Appendices

- A. Project Organisation
- B. Tentative Construction Programme
- C. Action and Limit Levels for Construction Phase
- D. Event and Action Plan for Air Quality, Noise, Landscape and Visual Impact
- E. Monitoring Schedule
- F. Calibration Certifications
- G. Graphical Plots of the Monitoring Results
- H. Meteorological Data Extracted from Hong Kong Observatory
- I. Waste Flow table
- J. Environmental Mitigation Measures – Implementation Status
- K. Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

## **A. Project Organisation**

# Project Organization



**Table A-1: Contract Information**

| Company Name  | Role  | Name              | Telephone | Email                                 |
|---|---|-------------------|-----------|---------------------------------------|
| West Kowloon Cultural District Authority            | WKCDA Representative & Project ETL              | Mr. C.K. WU       | 5506 9178 | ck.wu@wkcd.hk                         |
| Meinhardt Infrastructure & Environment Limited      | Independent Environmental Checker               | Ms. Claudine LEE  | 2859 5409 | caludinelee@meinhardt.com.hk          |
| AECOM Asia Company Limited                          | Resident Engineer                               | Mr. Alex GBAGUIDI | 3619 6287 | alex.gbaguidi@aecom.com               |
| Bachy Soletanche – Fujita Corporation Joint Venture | Quality, Safety, Health & Environmental Manager | Mr. Vincent CHAN  | 9733 7310 | Chuen.Kwok.CHAN@soletanche-bachy.com  |
| Bachy Soletanche – Fujita Corporation Joint Venture | Environmental Engineer                          | Mr. William CHAN  | 54083045  | william-hou.chan@soletanche-bachy.com |
| Apex Testing & Certification Limited                | Contractor's Environmental Team Leader          | Mr. Calvin LUI    | 9629 9718 | calvinlui@apextestcert.com            |

## **B. Tentative Construction Programme**

Project Name: Foundation and ELS Works for Integrated Basement and Underground Road in Zone 2A of the West Kowloon Cultural District

3-Month Rolling Programme

| Activity ID                | Activity Description  | Duration<br>(Cal. Day) | Start Date | Finish Date | 2021 |     |     |     |     |     |     |     |     |     |     |     |     |
|----------------------------|---|------------------------|------------|-------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                            |   |                        |            |             | Jan  |     |     |     |     | Feb |     |     |     | Mar |     |     |     |
|                            |   |                        |            |             | 1    | 8   | 15  | 22  | 29  | 5   | 12  | 19  | 26  | 5   | 12  | 19  | 26  |
|                            |   |                        |            |             | W34  | W35 | W36 | W37 | W38 | W39 | W40 | W41 | W42 | W43 | W44 | W45 | W46 |
|                            | Preliminaries Works   |                        |            |             |      |     |     |     |     |     |     |     |     |     |     |     |     |
| PRE. 10010                 | Water, Power and Discharge Point Installation   | 174                    | 8-May-20   | 28-Oct-20   |      |     |     |     |     |     |     |     |     |     |     |     |     |
|                            | Grouting Works (Trial 1 & Trial 2)  |                        |            |             |      |     |     |     |     |     |     |     |     |     |     |     |     |
|                            | Pipe Pile Construction (Trial 1 and 2) (40/40 Nos Completed)  | 36                     | 7-Oct-20   | 11-Nov-20   |      |     |     |     |     |     |     |     |     |     |     |     |     |
|                            | Trial Grouting (Trial 1 and 2) - Stage 2 grouting (24/48 Nos Completed)   | 54                     | 19-Dec-20  | 10-Feb-21   |      |     |     |     |     |     |     |     |     |     |     |     |     |
|                            | ELS (Stage 1) - Grouting / Pipe Pile Works  |                        |            |             |      |     |     |     |     |     |     |     |     |     |     |     |     |
| 2A1. 10290                 | King Post (0/65 Nos Completed)  | 59                     | 1-Apr-21   | 29-May-21   |      |     |     |     |     |     |     |     |     |     |     |     |     |
|                            | Bored Pile Works  |                        |            |             |      |     |     |     |     |     |     |     |     |     |     |     |     |
|                            | Bored Pile Construction (Total 32 Nos. 2~4 Workfront)   |                        |            |             |      |     |     |     |     |     |     |     |     |     |     |     |     |
| 2A1. 10040 &<br>2A1. 10050 | BP31L, BP33L, BP34I1, BP34G, BP31P, BP36F1, BP31R, BP33G<br>(6 Nos. Cast; 1 Nos. completed RCD; 1 Nos. RCD in progress) | 198                    | 9-Nov-20   | 25-May-21   |      |     |     |     |     |     |     |     |     |     |     |     |     |
|                            | ELS (Stage 1) - Grouting / Pipe Pile Works  |                        |            |             |      |     |     |     |     |     |     |     |     |     |     |     |     |
| 2A2. 10210                 | Stage 1a & 1b grouting (155/1054 Nos Completed)   | 404                    | 22-Oct-20  | 29-Nov-21   |      |     |     |     |     |     |     |     |     |     |     |     |     |
| 2A2. 10180                 | Pipe Pile Construction (1/523 Nos Completed)  | 408                    | 17-Nov-20  | 29-Dec-21   |      |     |     |     |     |     |     |     |     |     |     |     |     |

- Actual
- Remaining Works
- Critical Remaining Works

## **C. Action and Limit Levels for Construction Phase**



## **Air Quality**

The Action and Limit Levels for 1-hour and 24-hour TSP for the monitoring stations are presented in following tables:

**Table C-1: Action and Limit Levels for 1-hour TSP**

| Monitoring Station | Action Level (µg/m <sup>3</sup> ) | Limit Level (µg/m <sup>3</sup> ) |
|--------------------|-----------------------------------|----------------------------------|
| AM3A               | 280.4                             | 500                              |
| AM4A               | 278.5                             | 500                              |
| AM5A               | 275.4                             | 500                              |

**Table C-2: Action and Limit Levels for 24-hour TSP**

| Monitoring Station | Action Level (µg/m <sup>3</sup> ) | Limit Level (µg/m <sup>3</sup> ) |
|--------------------|-----------------------------------|----------------------------------|
| AM3A               | 152.4                             | 260                              |
| AM4A               | 152.6                             | 260                              |
| AM5A               | 141.1                             | 260                              |

## **Noise**

The Action and Limit Levels for Noise for the monitoring stations are presented in following table:

**Table C-3: Action and Limit Levels for Construction Noise**

| Time Period & Monitoring Locations | Action Level   | Limit Level |
|------------------------------------|--|-------------|
| NM2A, NM3A, NM4A and NM5A          |  |             |
| 0700-1900 hours on normal weekdays | When one valid documented complaint is received from any one of the sensitive receiver | 75          |

Note:

\*Reduce to 70dB(A) for school and 65 dB(A) during school examination period.

## **D. Event and Action Plan for Air Quality, Noise, Landscape and Visual Impact**

## Air Quality

In case the Action and Limit Levels are not complied during construction stage, the following Event and Action Plan should be followed:

**Table D-1: Typical Event and Action Plan for Air Quality**

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

| Event   | Action   |  |   |   |
|---|--|--|---|---|
|   | ET   | IEC  | WKCD  | Contractor  |
| <b>Limit Level</b>                                |  |  |   |   |
| 1. Exceedance for one sample                      | 1. Identify source, investigate the causes of exceedance and propose remedial measures;<br>2. Inform WKCD, Contractor and EPD;<br>3. Repeat measurement to confirm finding;<br>4. Increase monitoring frequency to daily;<br>5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCD informed of the results.  | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method;<br>3. Discuss with ET and Contractor on possible remedial measures;<br>4. Advise the WKCD on the effectiveness of the proposed remedial measures;<br>5. Monitor the implementation of remedial measures.  | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. Ensure remedial measures properly implemented.   | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within three working days of notification;<br>3. Implement the agreed proposals;<br>4. Amend proposal if appropriate.  |
| 2. Exceedance for two or more consecutive samples | 1. Notify IEC, WKCD, Contractor and EPD;<br>2. Identify source;<br>3. Repeat measurement to confirm findings;<br>4. Increase monitoring frequency to daily;<br>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;<br>6. Arrange meeting with IEC and WKCD to discuss the remedial actions to be taken;<br>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCD informed of the results;<br>8. If exceedance stops, cease additional monitoring. | 1. Check monitoring data submitted by ET;<br>2. Check Contractor's working method;<br>3. Discuss amongst WKCD, ET, and Contractor on the potential remedial actions;<br>4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCD accordingly;<br>5. Monitor the implementation of remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;<br>4. Ensure remedial measures properly implemented;<br>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC within three working days of notification;<br>3. Implement the agreed proposals;<br>4. Resubmit proposals if problem still not under control;<br>5. Stop the relevant portion of works as determined by the WKCD until the exceedance is abated. |

## **Construction Noise**

In case the Action and Limit Levels are not complied during construction stage, the following Event and Action Plan should be followed:

**Table D-2: Event and Action Plan for Construction Noise**

| Event        | Action  |   |  |   |
|--------------|---|---|--|---|
|              | ET  | IEC   | WKCD   | Contractor  |
| Action Level | 1. Notify WKCD, IEC and Contractor;<br>2. Carry out investigation;<br>3. Report the results of investigation to the IEC, WKCD and Contractor;<br>4. Discuss with the IEC and Contractor on remedial measures required;<br>5. Increase monitoring frequency to check mitigation effectiveness.   | 1. Review the investigation results submitted by the ET;<br>2. Review the proposed remedial measures by the Contractor and advise the WKCD accordingly;<br>3. Advise the WKCD on the effectiveness of the proposed remedial measures. | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;<br>4. Supervise the implementation of remedial measures.   | 1. Submit noise mitigation proposals to IEC and WKCD;<br>2. Implement noise mitigation proposals.   |
| Limit Level  | 1. Inform IEC, WKCD, Contractor and EPD;<br>2. Repeat measurements to confirm findings;<br>3. Increase monitoring frequency;<br>4. Identify source and investigate the cause of exceedance;<br>5. Carry out analysis of Contractor's working procedures;<br>6. Discuss with the IEC, Contractor and WKCD on remedial measures required;<br>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCD informed of the results;<br>8. If exceedance stops, cease additional monitoring. | 1. Discuss amongst WKCD, ET, and Contractor on the potential remedial actions;<br>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCD accordingly.                           | 1. Confirm receipt of notification of failure in writing;<br>2. Notify Contractor;<br>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;<br>4. Supervise the implementation of remedial measures;<br>5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated. | 1. Take immediate action to avoid further exceedance;<br>2. Submit proposals for remedial actions to IEC and WKCD within 3 working days of notification;<br>3. Implement the agreed proposals;<br>4. Submit further proposal if problem still not under control;<br>5. Stop the relevant portion of works as instructed by the WKCD until the exceedance is abated. |

## Landscape and Visual Impact

In case of non-compliance of landscape and visual impacts, procedures in accordance with the Event and Action Plan should be followed:

**Table D-3: Event and Action Plan for Landscape and Visual Impact**

| Event                          | Action   |  |   |  |
|--------------------------------|--|--|---|--|
|                                | Action   | Event  | Action  | Event  |
| Design Check                   | 1. Design check to make sure the design complies with all the proposed mitigation measures in the EIA report;<br>2. Prepare and submit report.   | 1. Check report submitted by ET;<br>2. Recommend remedial design if necessary.   | 1. Undertake remedial design if necessary.                                    | -  |
| Non-conformity on one occasion | 1. Identify source of non-conformity;<br>2. Report to IEC and WKCD;A;<br>3. Discuss remedial actions with IEC, WKCD;A and Contractor;<br>4. Monitor remedial actions until rectification has been completed.   | 1. Check and verify source of non-conformity;<br>2. Discuss remedial actions with ET and Contractor;<br>3. Advise WKCD;A on effectiveness of proposed remedial actions;<br>4. Check implementation of remedial actions.  | 1. Notify Contractor;<br>2. Ensure remedial actions are properly implemented. | 1. Amend working method as necessary;<br>2. Rectify damage and undertake necessary replacement and remedial actions. |
| Repeated non-conformity        | 1. Identify source of non-conformity;<br>2. Report to IEC and WKCD;A;<br>3. Increase monitoring frequency;<br>4. Discuss remedial actions with IEC, WKCD;A and Contractor;<br>5. Monitor remedial actions until rectification has been completed;<br>6. If non-conformity rectified, reduce monitoring frequency back to normal. | 1. Check and verify source of non-conformity;<br>2. Check Contractor's working method;<br>3. Discuss remedial actions with ET and Contractor;<br>4. Advise WKCD;A on effectiveness of proposed remedial actions;<br>5. Supervise implementation of remedial actions. | 1. Notify Contractor;<br>2. Ensure remedial actions are properly implemented. | 1. Amend working method as necessary;<br>2. Rectify damage and undertake necessary replacement and remedial actions. |

## **E. Monitoring Schedule**

Notes:

- AM3A - Northeast corner of West Kowloon Station's station box (G/F)
- AM4A - Southeast corner of West Kowloon Station's station box (G/F)
- AM5A - North of West Kowloon Station's station box (G/F)
- NM2A - The Arch – Sun Tower (G/F)
- NM3A - Xiqu Centre (G/F)
- NM4A - Next to Tsim Sha Tsui Fire Station (G/F)
- NM5A - Pedestrian road (G/F) outside West Kowloon Station

# January 2021 (Hong Kong)

| Sun | Mon | Tue   | Wed   | Thu   | Fri  | Sat  |
|-----|-----|---|---|---|--|--|
| 27  | 28  | 29  | 30  | 31<br>New Year's Eve  | 1<br>● New Year's Day  | 2<br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring |
| 3   | 4   | 5   | 6   | 7   | 8<br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 9  |
| 10  | 11  | 12  | 13  | 14<br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 15   | 16   |
| 17  | 18  | 19  | 20<br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 21  | 22   | 23   |
| 24  | 25  | 26<br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 27  | 28  | 29   | 30   |
| 31  | 1   | 2   | 3   | 4   | 5  | 6  |



Notes:

- AM3A - Northeast corner of West Kowloon Station's station box (G/F)
- AM4A - Southeast corner of West Kowloon Station's station box (G/F)
- AM5A - North of West Kowloon Station's station box (G/F)
- NM2A - The Arch – Sun Tower (G/F)
- NM3A - Xiqu Centre (G/F)
- NM4A - Next to Tsim Sha Tsui Fire Station (G/F)
- NM5A - Pedestrian road (G/F) outside West Kowloon Station

# February 2021 (Hong Kong)

| Sun                   | Mon  | Tue   | Wed   | Thu   | Fri   | Sat  |
|-----------------------|--|---|---|---|---|--|
| 31                    | 1<br><br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 2   | 3   | 4   | 5   | 6<br><br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring |
| 7                     | 8  | 9   | 10<br><br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 11  | 12<br><br>● Chinese Lunar New Year's<br>Day | 13<br><br>● Second day of Chinese Lunar<br>New Year  |
| 14<br>Valentine's Day | 15<br><br>● Fourth day of Chinese Lunar<br>New Year  | 16<br><br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 17  | 18<br><br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 19  | 20   |
| 21                    | 22   | 23  | 24<br><br>AM3A,AM4A,AM5A -<br>24-hr TSP, 1-hr TSP X 3<br>NM2A,NM3A,NM4A,NM5A -<br>Noise Impact Monitoring | 25  | 26  | 27   |
| 28                    | 1  | 2   | 3   | 4   | 5   | 6  |

## **F. Calibration Certifications**

## Certificate of Calibration

**Calibration Certification Information**

|                                      |                               |                   |
|--------------------------------------|-------------------------------|-------------------|
| <b>Cal. Date:</b> November 2, 2020   | <b>Rootsmeter S/N:</b> 438320 | <b>Ta:</b> 294 °K |
| <b>Operator:</b> Jim Tisch           | <b>Pa:</b> 756.7 mm Hg        |                   |
| <b>Calibration Model #:</b> TE-5025A | <b>Calibrator S/N:</b> 3543   |                   |

| Run | Vol. Init (m3) | Vol. Final (m3) | ΔVol. (m3) | ΔTime (min) | ΔP (mm Hg) | ΔH (in H2O) |
|-----|----------------|-----------------|------------|-------------|------------|-------------|
| 1   | 1              | 2               | 1          | 1.4310      | 3.2        | 2.00        |
| 2   | 3              | 4               | 1          | 1.0110      | 6.4        | 4.00        |
| 3   | 5              | 6               | 1          | 0.9000      | 8.0        | 5.00        |
| 4   | 7              | 8               | 1          | 0.8560      | 8.9        | 5.50        |
| 5   | 9              | 10              | 1          | 0.7100      | 12.9       | 8.00        |

**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) |
|-------------|---------------|--|-----------|-------------|---|
| 1.0049      | 0.7022        | 1.4207   | 0.9958    | 0.6959      | 0.8815  |
| 1.0006      | 0.9897        | 2.0091   | 0.9915    | 0.9808      | 1.2467  |
| 0.9985      | 1.1094        | 2.2463   | 0.9894    | 1.0994      | 1.3938  |
| 0.9973      | 1.1651        | 2.3559   | 0.9882    | 1.1545      | 1.4619  |
| 0.9920      | 1.3971        | 2.8414   | 0.9830    | 1.3844      | 1.7631  |
| <b>QSTD</b> | <b>m=</b>     | <b>2.03936</b>   | <b>QA</b> | <b>m=</b>   | <b>1.27701</b>  |
|             | <b>b=</b>     | <b>-0.01298</b>  |           | <b>b=</b>   | <b>-0.00805</b>   |
|             | <b>r=</b>     | <b>0.99995</b>   |           | <b>r=</b>   | <b>0.99995</b>  |

**Calculations**

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

**Standard Conditions**

|   |           |
|---|-----------|
| <b>Tstd:</b>                              | 298.15 °K |
| <b>Pstd:</b>                              | 760 mm Hg |
| <b>Key</b>                                |           |
| 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: AM3A      Zones 2A at West      Date: 11-Nov-20  
Sampler: TE-5170      Site ID: Kowloon Cultural      Tech: CS Tang  
Serial No: 4340

### Site Conditions

Barometric Pressure (in Hg): 30.14      Corrected Pressure (mm Hg): 766  
Temperature (deg F): 73      Temperature (deg K): 296  
Average Press. (in Hg): 30.14      Corrected Average (mm Hg): 766  
Average Temp. (deg F): 73      Average Temp. (deg K): 296

### Calibration Orifice

Make: Tisch      Qstd Slope: 2.03936  
Model: TE-5025A      Qstd Intercept: -0.01298  
Serial#: 3543      Date Certified: 2-Nov-20

### Calibration Information

| Plate or<br>Test # | H2O<br>(in) | Qstd<br>(m3/min) | I<br>(chart) | IC<br>(corrected) | Linear Regression    |
|--------------------|-------------|------------------|--------------|-------------------|----------------------|
| 1                  | 12.20       | 1.732            | 53.0         | 53.39             | Slope: 29.9241       |
| 2                  | 10.50       | 1.607            | 48.0         | 48.36             | Intercept: 1.1241    |
| 3                  | 7.30        | 1.341            | 41.0         | 41.30             | Corr. Coeff: 0.9982  |
| 4                  | 4.40        | 1.043            | 33.0         | 33.24             |                      |
| 5                  | 2.30        | 0.756            | 23.0         | 23.17             | # 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): 40

Average Flow Calculation m3/min

1.295591082

Average Flow Calculation in CFM

45.74732111

Sample Time (Hrs): 1.0

Total Flow in m3/min

77.73546492

Total Flow in CFM

2744.839266

NOTE: Ensure calibration orifice has been certified within 12 months of use



## TE-5170 Calibration Worksheet

### Site Information

Location: AM3A      Site ID: **Zones 2A at West**      Date: 9-Jan-21  
Sampler: TE-5170      Serial No: 4340      Tech: CS Tang

### Site Conditions

Barometric Pressure (in Hg): 30.25      Corrected Pressure (mm Hg): 768  
Temperature (deg F): 51      Temperature (deg K): 284  
Average Press. (in Hg): 30.25      Corrected Average (mm Hg): 768  
Average Temp. (deg F): 51      Average Temp. (deg K): 284

### Calibration Orifice

Make: Tisch      Qstd Slope: 2.03936  
Model: TE-5025A      Qstd Intercept: -0.01298  
Serial#: 3543      Date Certified: 2-Nov-20

### Calibration Information

| Plate or<br>Test # | H2O<br>(in) | Qstd<br>(m3/min) | I<br>(chart) | IC<br>(corrected) | Linear Regression    |
|--------------------|-------------|------------------|--------------|-------------------|----------------------|
| 1                  | 12.30       | 1.779            | 53.0         | 54.63             | Slope: 29.6607       |
| 2                  | 10.40       | 1.636            | 48.0         | 49.48             | Intercept: 1.5918    |
| 3                  | 7.20        | 1.363            | 41.0         | 42.26             | Corr. Coeff: 0.9993  |
| 4                  | 4.50        | 1.079            | 33.0         | 34.02             |                      |
| 5                  | 2.20        | 0.756            | 23.0         | 23.71             | # of Observations: 5 |

### Calculations

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

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

Average I (chart): 4.0

Average Flow Calculation m3/min

1.322513243

Average Flow Calculation in CFM

46.69794263

Sample Time (Hrs): 1.0

Total Flow in m3/min

79.35079461

Total Flow in CFM

2801.876558

NOTE: Ensure calibration orifice has been certified within 12 months of use



## Site Information

Location: AM4A      Zones 2A at West      Date: 11-Nov-20  
 Sampler: TE-5170      Site ID: Kowloon Cultural      Tech: CS Tang  
 Serial No: 3998

## Site Conditions

Barometric Pressure (in Hg): 30.14      Corrected Pressure (mm Hg): 766  
 Temperature (deg F): 73      Temperature (deg K): 296  
 Average Press. (in Hg): 30.14      Corrected Average (mm Hg): 766  
 Average Temp. (deg F): 73      Average Temp. (deg K): 296

## Calibration Orifice

Make: Tisch      Qstd Slope: 2.03936  
 Model: TE-5025A      Qstd Intercept: -0.01298  
 Serial#: 3543      Date Certified: 2-Nov-20

## Calibration Information

| Plate or<br>Test # | H2O<br>(in) | Qstd<br>(m3/min) | I<br>(chart) | IC<br>(corrected) | Linear Regression    |
|--------------------|-------------|------------------|--------------|-------------------|----------------------|
| 1                  | 12.50       | 1.753            | 53.0         | 53.39             | Slope: 29.0451       |
| 2                  | 10.20       | 1.584            | 48.0         | 48.36             | Intercept: 2.3506    |
| 3                  | 7.60        | 1.368            | 41.0         | 41.30             | Corr. Coeff: 0.9976  |
| 4                  | 4.20        | 1.019            | 33.0         | 33.24             |                      |
| 5                  | 2.20        | 0.739            | 23.0         | 23.17             | # 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): 40

Average Flow Calculation m3/min

1.292573154

Average Flow Calculation in CFM

45.64075807

Sample Time (Hrs): 1.0

Total Flow in m3/min

77.55438925

Total Flow in CFM

2738.445484

NOTE: Ensure calibration orifice has been certified within 12 months of use



## TE-5170 Calibration Worksheet

### Site Information

Location: AM4A      Site ID: **Zones 2A at West**      Date: 9-Jan-21  
Sampler: TE-5170      Serial No: 3998      Tech: CS Tang

### Site Conditions

Barometric Pressure (in Hg): 30.25      Corrected Pressure (mm Hg): 768  
Temperature (deg F): 51      Temperature (deg K): 284  
Average Press. (in Hg): 30.25      Corrected Average (mm Hg): 768  
Average Temp. (deg F): 51      Average Temp. (deg K): 284

### Calibration Orifice

Make: Tisch      Qstd Slope: 2.03936  
Model: TE-5025A      Qstd Intercept: -0.01298  
Serial#: 3543      Date Certified: 2-Nov-20

### Calibration Information

| Plate or<br>Test # | H2O<br>(in) | Qstd<br>(m3/min) | I<br>(chart) | IC<br>(corrected) | Linear Regression    |
|--------------------|-------------|------------------|--------------|-------------------|----------------------|
| 1                  | 12.30       | 1.779            | 53.0         | 54.63             | Slope: 29.6295       |
| 2                  | 10.30       | 1.628            | 48.0         | 49.48             | Intercept: 1.6295    |
| 3                  | 7.50        | 1.391            | 41.0         | 42.26             | Corr. Coeff: 0.9971  |
| 4                  | 4.20        | 1.042            | 33.0         | 34.02             |                      |
| 5                  | 2.30        | 0.773            | 23.0         | 23.71             | # of Observations: 5 |

### Calculations

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

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

$1/m((I[\text{Sqrt}(298/Tav)(Pav/760)]-b)$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

Average I (chart): 40

Average Flow Calculation m3/min

1.322634005

Average Flow Calculation in CFM

46.70220672

Sample Time (Hrs): 1.0

Total Flow in m3/min

79.3580403

Total Flow in CFM

2802.132403

NOTE: Ensure calibration orifice has been certified within 12 months of use



## TE-5170 Calibration Worksheet

### Site Information

Location: AM5A      Zones 2A at West      Date: 11-Nov-20  
Sampler: TE-5170      Site ID: Kowloon Cultural      Tech: CS Tang  
Serial No: 4344

### Site Conditions

Barometric Pressure (in Hg): 30.14      Corrected Pressure (mm Hg): 766  
Temperature (deg F): 73      Temperature (deg K): 296  
Average Press. (in Hg): 30.14      Corrected Average (mm Hg): 766  
Average Temp. (deg F): 73      Average Temp. (deg K): 296

### Calibration Orifice

Make: Tisch      Qstd Slope: 2.03936  
Model: TE-5025A      Qstd Intercept: -0.01298  
Serial#: 3543      Date Certified: 2-11-2020

### Calibration Information

| Plate or<br>Test # | H2O<br>(in) | Qstd<br>(m3/min) | I<br>(chart) | IC<br>(corrected) | Linear Regression    |
|--------------------|-------------|------------------|--------------|-------------------|----------------------|
| 1                  | 12.10       | 1.725            | 53.0         | 53.39             | Slope: 29.6386       |
| 2                  | 10.10       | 1.576            | 48.0         | 48.36             | Intercept: 2.0292    |
| 3                  | 7.30        | 1.341            | 41.0         | 41.30             | Corr. Coeff: 0.9975  |
| 4                  | 4.10        | 1.007            | 33.0         | 33.24             |                      |
| 5                  | 2.20        | 0.739            | 23.0         | 23.17             | # 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): 40

Average Flow Calculation m3/min

1.277533737

Average Flow Calculation in CFM

45.10971624

Sample Time (Hrs): 1.0

Total Flow in m3/min

76.6520242

Total Flow in CFM

2706.582975

NOTE: Ensure calibration orifice has been certified within 12 months of use





## TE-5170 Calibration Worksheet

### Site Information

Location: AM5A      Site ID: **Zones 2A at West**      Date: 9-Jan-21  
Sampler: TE-5170      Serial No: 4344      Tech: CS Tang

### Site Conditions

Barometric Pressure (in Hg): 30.25      Corrected Pressure (mm Hg): 768  
Temperature (deg F): 51      Temperature (deg K): 284  
Average Press. (in Hg): 30.25      Corrected Average (mm Hg): 768  
Average Temp. (deg F): 51      Average Temp. (deg K): 284

### Calibration Orifice

Make: Tisch      Qstd Slope: 2.03936  
Model: TE-5025A      Qstd Intercept: -0.01298  
Serial#: 3543      Date Certified: 2-11-2020

### Calibration Information

| Plate or Test # | H2O (in) | Qstd (m3/min) | I (chart) | IC (corrected) | Linear Regression    |
|-----------------|----------|---------------|-----------|----------------|----------------------|
| 1               | 12.40    | 1.786         | 53.0      | 54.63          | Slope: 30.1991       |
| 2               | 10.20    | 1.621         | 48.0      | 49.48          | Intercept: 0.8190    |
| 3               | 7.30     | 1.372         | 41.0      | 42.26          | Corr. Coeff: 0.9977  |
| 4               | 4.30     | 1.054         | 33.0      | 34.02          |                      |
| 5               | 2.40     | 0.789         | 23.0      | 23.71          | # 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): 4.0

Average Flow Calculation m3/min

1.324526469

Average Flow Calculation in CFM

46.76902962

Sample Time (Hrs): 1.0

Total Flow in m3/min

79.47158813

Total Flow in CFM

2806.141777

NOTE: Ensure calibration orifice has been certified within 12 months of use



INTERNATIONAL  
ACCREDITATION  
SERVICE®

# CERTIFICATE OF ACCREDITATION

*This is to attest that*

## **AQUALITY TESTCONSULT LIMITED**

11A&B, KAI FONG GARDEN, PING CHE ROAD  
FANLING, HONG KONG

### **Calibration Laboratory CL-207**

has met the requirements of AC204, *IAS Accreditation Criteria for Calibration Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date October 19, 2020

Expiration Date December 1, 2021



A handwritten signature in black ink, reading "Raj Nathan".

**President**

# SCOPE OF ACCREDITATION

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## AQUALITY TESTCONSULT LIMITED

[www.aqtlgroup.com](http://www.aqtlgroup.com)

**Contact Name** Lee Mei Yee Julia

**Contact Phone** + 852-6309-2280

**Accredited to** ISO/IEC 17025:2017

**Effective Date** October 19, 2020

### CALIBRATION AND MEASUREMENT CAPABILITY (CMC)\*

| MEASURED<br>QUANTITY or DEVICE<br>TYPE CALIBRATED | RANGE  | UNCERTAINTY <sup>1,2</sup><br>(±) | CALIBRATION PROCEDURE<br>AND/OR STANDARD<br>EQUIPMENT USED  |
|---|--|-----------------------------------|---|
| <b>Dimensional</b>                                |  |                                   |   |
| Caliper -Vernier, Dial & Electronic <sup>3</sup>  | 0 mm to 300 mm   | 30 µm                             | Checker by comparison method (BS 887:1982)  |
| Steel Ruler <sup>3</sup>                          | 1 mm to 1000 mm  | 280 µm                            | Reference Steel Rule by comparison method (BS 4372:1968)  |
| Dial Indicator / Gauge (Plunger) <sup>3</sup>     | 0 mm to 50 mm  | 8 µm                              | Reference micrometer head by comparison method (BS 907:2008)  |
| Feeler Gauge <sup>3</sup>                         | 0.01 mm to 1 mm  | 8 µm                              | Reference Dial Gauge by comparison method (BS BS957-2008)   |
| Measuring tape <sup>3</sup>                       | 0 m to 1.5 m   | 1200 µm                           | Reference steel ruler by comparison method (BS 4035:1966)   |
| Engineering Square <sup>3</sup>                   | Length 0 mm to 160 mm  | 20 µm                             | Reference engineering square and Feeler Gauge (BS 939:2007)   |
| Slump cone <sup>3</sup>                           | Diameter = 0 mm to 200 mm<br>Thickness = 1.5 mm<br>Height = 0 mm to 300 mm | 560 µm<br>100 µm<br>560 µm        | Reference Caliper & Reference Steel ruler by direct measurement (Verification in accordance with in-house method for the dimensional requirements as specified CS1:1990 Vol.1 A4; CS1: 2010 Vol. 1, A5) |
| Tamping rod <sup>3</sup>                          | Diameter = 0 mm to 16 mm<br>Length = 600 mm                                | 600 µm<br>950 µm                  | Reference steel ruler & Reference Caliper by direct measurement (Verification in accordance with in-house method for the dimensional  |

\* If information in this CMC is presented in non-SI units, the conversion factors stated in NIST Special Publication 811 "Guide for the Use of the International System of Units (SI)" apply.

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| MEASURED<br>QUANTITY or DEVICE<br>TYPE CALIBRATED          | RANGE   | UNCERTAINTY <sup>1,2</sup><br>(±) | CALIBRATION PROCEDURE<br>AND/OR STANDARD<br>EQUIPMENT USED  |
|--|---|-----------------------------------|---|
|  |   |                                   | requirements as specified<br>CS1:1990 Vol.1 A5;CS1:<br>2010 Vol. 1, A6)   |
| Cube mould <sup>3</sup>                                    | (Max dimensions 150 mm<br>per side)<br>Dimension<br>Flatness<br>Perpendicularity<br>Parallelism | 50 µm<br>10 µm<br>10 µm<br>50 µm  | Reference Caliper, straight<br>edge & feeler gauge by direct<br>measurement. (Verification in<br>accordance with in-house<br>method for the dimensional<br>requirements as specified in<br>BS1881: Part 108:1983;<br>CS1:1990 Vol1, A21;<br>CS1:2010 Vol 1, A25; BS EN<br>12390-2:2000)         |
| Compacting Bar <sup>3</sup>                                | Ramming Face = 25 mm<br>Length = 380 mm<br>Weight = 1.8 kg                                      | 100 µm<br>560 µm<br>1 g           | Reference Caliper & Steel<br>ruler by direct measurement.<br>(Verification in accordance<br>with in-house method for the<br>dimensional & mass<br>requirements as specified in<br>BS1881: Part 105:1984 Cl<br>3.3; CS1:1990 Vol 2, E3<br>CS1:2010 Vol 1, A15.3; BS<br>EN 12350 -5:2000 Cl 4.3.) |
| Covermeter   | 20 mm to 103 mm   | 2.9 mm                            | Reference concrete block<br>(Verification in accordance<br>with in-house method for the<br>dimensional requirements as<br>specified in BS 1881:Part<br>204:1988 Cl.6.4- Method C)   |
| Flow table <sup>3</sup>                                    | 15 kg to 17 kg<br>1 mm to 71 mm   | 12 g<br>600 µm                    | Weighing Balance, Reference<br>caliper & Reference steel ruler<br>by direct measurement   |
| Test Sieve <sup>3</sup>                                    | 4 mm to 50 mm   | 50 µm                             | Reference Caliper by direct<br>measurement  |
| <b>Mechanical</b>  |   |                                   |   |
| Force Measuring Machine <sup>3</sup><br>(Compression Mode) | 1 kN to 3000 kN   | 0.4 %                             | Ref. Load cell by direct<br>measurement<br>BS 1610: Part 1:1985;<br>BS 1610: Part 1:1992;<br>BS EN ISO 12390-4:2000<br>Annex B;<br>BS EN ISO 7500-1:2004  |
| Laser Dust Meter <sup>3</sup>                              | Dust particles<br>0.001 mg/m <sup>3</sup> to 10.00 mg/m <sup>3</sup>                            | 0.9 mg/m <sup>3</sup>             | By comparison method by<br>using reference laser dust<br>meter  |

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| MEASURED QUANTITY or DEVICE TYPE CALIBRATED  | RANGE  | UNCERTAINTY <sup>1,2</sup> (±) | CALIBRATION PROCEDURE AND/OR STANDARD EQUIPMENT USED  |
|--|--|--------------------------------|---|
| Rebound Hammer <sup>3</sup>  | 80 unit (hardness)   | 1.6 rebound count              | Reference Rebound count by comparison method.<br>BS1881: Part 202:1986;<br>BS EN 12504-2:2001;<br>BS EN 12504-2:2012  |
| Mass (F2 class and coarser)  | 1 g to 200 g<br>200 g to 5 kg<br>5 kg to 10 kg<br>10 kg to 50 kg   | 1.3 mg<br>0.5 g<br>1 g<br>7 g  | Standard Weight E2/ F1 Class & Weighing Balances by comparison method (OIMLR111)  |
| Weighing Scale & Balance <sup>3</sup>  | 1 g to 200 g<br>200 g to 5 kg<br>5 kg to 50 kg   | 1 mg<br>1 g<br>15 g            | Standard weight of E2/F1 Grade by direct measurement  |
| Volumetric Glassware   | 1 mL to 100 mL<br>100 mL to 1000 mL  | 0.004 mL<br>0.09 mL            | Standard weight E2 Class, Weighing Balances & Distilled water by gravimetric method   |
| <b>Thermal</b>   |  |                                |   |
| Digital/Liquid in Glass Thermometers & RTD/ Thermocouples with or without Indicators | 15 °C to 55°C<br>55°C to 95°C  | 0.4 °C<br>0.9 °C               | Water Baths, Reference Sensor and Indicator by Comparison Method (OIML R133)  |
| Curing Tank <sup>3</sup>   | (Calibration at 20 °C & 27 °C @ 30 min)<br>20 °C Temperature distribution<br>27 °C Temperature distribution<br>Efficiency of circulation | 0.4 °C<br>0.8 °C<br>5 s        | Reference Temperature datalogger by Mapping Method & Reference Stop Watch (Verification in accordance with in-house method for the Temp & Time requirements as specified in BS1881-111:1983<br>CS1:1990 Vol 1 App A24<br>CS1:2010 Vol 1 App A28<br>BE EN 12390-2:2000 |
| Oven <sup>3</sup>  | 40.0 °C to 180.0 °C  | 1.5 °C                         | Reference Temperature datalogger by Mapping Method (AS 2853:1986)   |
| Furnace <sup>3</sup>   | 200 °C to 1300 °C  | 6 °C                           | Reference Thermocouple with Indicator By single point Calibration (AS 2853:1986)  |
| Water bath <sup>3</sup>  | 15 °C to 95 °C   | 0.2 °C                         | Reference Temperature datalogger by Mapping Method (AS 2853:1986)   |
| <b>Time and Frequency</b>  |  |                                |   |
| Stop Watch/ Timer <sup>3</sup>   | 10 s to 3600 s   | 0.2 s                          | Reference stop watch  |



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| MEASURED<br>QUANTITY or DEVICE<br>TYPE CALIBRATED | RANGE      | UNCERTAINTY <sup>1,2</sup><br>(±) | CALIBRATION PROCEDURE<br>AND/OR STANDARD<br>EQUIPMENT USED      |
|---|------------|-----------------------------------|---|
| Grout Flow Cone <sup>3</sup>                      | 7 s to 9 s | 0.2 s                             | Reference stop watch by<br>direct method<br>(ASTM C939-10 Cl.9) |

<sup>1</sup>The uncertainty covered by the Calibration and Measurement Capability (CMC) is expressed as the expanded uncertainty having a coverage probability of approximately 95 %. It is the smallest measurement uncertainty that a laboratory can achieve within its scope of accreditation when performing calibrations of a best existing device. The measurement uncertainty reported on a calibration certificate may be greater than that provided in the CMC due to the behavior of the calibration item and other factors that may contribute to the uncertainty of a specific calibration.

<sup>2</sup>When uncertainty is stated in relative terms (such as percent, a multiplier expressed as a decimal fraction or in scientific notation), it is in relation to instrument reading or instrument output, as appropriate, unless otherwise indicated.

<sup>3</sup>Also available as site calibration. Note that actual measurement uncertainties achievable at a customer's site can normally be expected to be larger than the uncertainties listed on this Scope of Accreditation.

# FAQ / Information

## Mutual Recognition Arrangements (MRA) / Multilateral Recognition Arrangements (MLA)

### Mutual Recognition Arrangement (MRA) Partners for HOKLAS ^

Every effort is made to promote acceptance of test data from accredited laboratories, both internationally and locally. HKAS has concluded mutual recognition arrangements with accreditation bodies listed below by being one of the signatories of the [International Laboratory Accreditation Cooperation Mutual Recognition Arrangement \(ILAC MRA\)](#) and the [Asia Pacific Accreditation Cooperation Mutual Recognition Arrangement \(APAC MRA\)](#) for testing, calibration, medical testing, Proficiency Testing Providers (PTP) and Reference Material Producers (RMP). Click [here](#) to view the up-to-date signatories of ILAC and [here](#) to access the up-to-date signatories of APAC.

Visitors checking the names, logos and accreditation symbols shown on an endorsed certificate or report should note that some of our MRA partners may have their names, logos or accreditation symbols changed recently and test reports or certificates endorsed by displaying their old accreditation symbols may still be valid during the change-over period. For details, please visit their websites or contact them directly.

» [Mutual Recognition Arrangement \(MRA\) Partners for HOKLAS](#)

HKAS MRA partners will recognise HOKLAS endorsed test certificates as having the same technical validity as certificates endorsed by their respective schemes.

### Multilateral Recognition Arrangements (MLA) for HKCAS ^

HKAS has been a signatory of [Asia Pacific Accreditation Cooperation Mutual Recognition Arrangement \(APAC MRA\)](#) for Quality Management System (QMS), Environmental Management System (EMS), Food Safety Management System (FSMS), Energy Management System (EnMS), Occupational Health and Safety Management System (OHSMS) certifications, product certifications, and Greenhouse Gas (GHG) validation and verification.

HKAS has also been a signatory of the [International Accreditation Forum Multilateral Recognition Arrangement \(IAF MLA\)](#) for Quality Management System (QMS), Environmental Management System (EMS), Food Safety Management System (FSMS), Energy Management System (EnMS), Occupational Health and Safety Management System (OHSMS) certifications, product certifications, and Greenhouse Gas (GHG) validation and verification.

Click [here](#) to view the up-to-date signatories of IAF and [here](#) to access the up-to-date signatories of APAC.

» [Mutual / Multilateral Recognition Arrangements \(MRA / MLA\) Partners for HKCAS](#)

### Mutual Recognition Arrangement (MRA) Partners for HKIAS ^

HKAS has concluded mutual recognition arrangements with accreditation bodies listed below by being one of the signatories of the [International Laboratory Accreditation Cooperation Mutual Recognition Arrangement \(ILAC MRA\)](#) and [Asia Pacific Accreditation Cooperation Mutual Recognition Arrangement \(APAC MRA\)](#) for inspection. Click [here](#) to view the up-to-date signatories of ILAC and [here](#) to access the up-to-date signatories of APAC.

HKAS MRA partners will recognise HKIAS endorsed inspection reports or certificates having the same technical validity as reports or certificates endorsed by their respective schemes.

» [Mutual Recognition Arrangement \(MRA\) Partners for HKIAS](#)

 back



## Hong Kong Laboratory Accreditation Scheme (HOKLAS) - Mutual Recognition Arrangement (MRA) Partners

| Economy  | Logo  | Name of Partner   | URL   | Test Area  |
|--|---|---|---|--|
| United Kingdom of Great Britain and Northern Ireland |    | United Kingdom Accreditation Service (UKAS)                 | <a href="http://www.ukas.com">http://www.ukas.com</a>   | Calibration,<br>Medical Testing,<br>Proficiency Testing Provider,<br>Reference Material Producer,<br>Non-medical Testing |
| United States of America                             |   | AIHA Laboratory Accreditation Programs, LLC (AIHA-LAP, LLC) | <a href="http://www.aihaaccreditedlabs.org/">http://www.aihaaccreditedlabs.org/</a>                 | Non-medical Testing  |
| United States of America                             |    | American Association for Laboratory Accreditation (A2LA)    | <a href="http://www.a2la.org/">http://www.a2la.org/</a>   | Calibration,<br>Medical Testing,<br>Proficiency Testing Provider,<br>Reference Material Producer,<br>Non-medical Testing |
| United States of America                             |   | ANSI-ASQ National Accreditation Board (ANAB)                | <a href="https://www.ansi.org/accreditation/Default">https://www.ansi.org/accreditation/Default</a> | Calibration,<br>Medical Testing,<br>Proficiency Testing Provider,<br>Reference Material Producer,<br>Non-medical Testing |
| United States of America                             |  | International Accreditation Service Inc. (IAS)              | <a href="http://www.iasonline.org/">http://www.iasonline.org/</a>                                   | Calibration,<br>Non-medical Testing  |
| United States of America                             |  | National Voluntary Laboratory Accreditation Program (NVLAP) | <a href="http://www.nist.gov/nvlap">http://www.nist.gov/nvlap</a>                                   | Calibration,<br>Non-medical Testing  |

**東恒測試顧問有限公司****AQUALITY TESTCONSULT LIMITED**

香港新界粉嶺坪輦路啟芳園11A&amp;11B號

No. 11A&amp;B, KAI FONG GARDEN, PING CHE ROAD, FANLING, NEW TERRITORIES, HONG KONG

TEL : 852-3582-9589 FAX : 852-2674-1177 EMAIL : cal.aqtl@gmail.com WEBSITE: www.aqtlgroup.com

**CERTIFICATE OF CALIBRATION**

Report Number : 201108MCA-126F  
 Date of Report : 12-Nov-20  
 Page Number : 1 of 2  
 Customer \* : Apex Testing & Certification Ltd.  
 Customer Address\* : Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK  
 Customers Ref. \* : A005

**Item Under Calibration (IUC)\***

Equipment No. : N/A  
 Manufacturer : Sibata Scientific Technology Ltd  
 Model No. : LD-3B  
 Serial No. : 235811  
 Scale Division : 0.001 mg/m<sup>3</sup>  
 Range : 0.001 to 1 mg/m<sup>3</sup>  
 Condition of Item : Normal

Date Item Received : 8-Nov-20  
 Date Calibrated : 8-Nov-20  
 Calibration Location : AQuality Calibration Lab.  
 Date of Next Calibration : 7-Nov-21  
 Calibrated By : Jessica Liu

**Test Environment**

Ambient Temperature : 27.5 °C to 23.9 °C  
 Relative Humidity : 51 % to 83 %

**Calibration Results**

| Reference True Reading (mg/m <sup>3</sup> ) | Average IUC Reading (mg/m <sup>3</sup> ) | Correction (mg/m <sup>3</sup> ) | Error of IUC Reading (%) | Expanded Uncertainty (mg/m <sup>3</sup> ) | Coverage Factor K |
|---|--|---------------------------------|--------------------------|---|-------------------|
| 0.158                                       | 0.167                                    | -0.008                          | 5.1%                     | 0.020                                     | 2.0               |
| 5.164                                       | 5.647                                    | -0.484                          | 8.5%                     | 0.463                                     | 2.0               |
| 10.100                                      | 11.141                                   | -1.041                          | 9.3%                     | 0.904                                     | 2.0               |

**Remarks :**

- \* Denotes information supplied by customer.
- The results relate only to the items calibrated.
- The results apply to the items as received.
- Correction = Average of (Ref reading - IUC reading)
- The technical requirement of laser dust meter. +/- 20% error for the particles concentration.

Approved by:

LEE Mei Yee, Julia  
 Managing Director

**CERTIFICATE OF CALIBRATION**

Report Number : 201108MCA-126F  
Date of Report : 12-Nov-20  
Page Number : 2 of 2  
Customer \* : Apex Testing & Certification Ltd.  
Customers Ref. \* : A005

**Details of Calibration**

1. The calibration was performed in accordance with AQuality Testconsult Procedure Number ENV-L-003 (in-house method), by comparison with the laboratory's reference equipment which have traceable international standards of measurement.
2. The item under calibration (IUC) was allowed to stabilize in the laboratory for 0.25 hour before commencement of calibration.
3. A set of readings were made at each calibration concentration. The values quoted in the results are the average of each set of readings.
4. The values given in this calibration certificate only relate to the values measured at the time of calibration. Any uncertainties quoted do not include allowance for the capability of any other laboratory to repeat the measurement. The uncertainty quoted relate only to item at time of calibration. AQuality Testconsult Limited is not liable for any loss or damage resulting from the use of this equipment.
5. The identification, calibration certificate numbers for the reference equipment used were as follows :

| <u>Equipment Number</u> | <u>Certificate Number</u> | <u>Description</u> |
|-------------------------|---------------------------|--------------------|
| CH-LDM-1                | HBW202001563              | 粉尘测试仪              |

6. Copies of the Calibration certificates of the reference equipment used in this calibration may be obtained from AQuality Testconsult Limited, if necessary.

- End of Report -



東恒測試顧問有限公司

AQUALITY TESTCONSULT LIMITED

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TEL : 852-3582-9589

FAX : 852-2674-1177

EMAIL : cal.aqtl@gmail.com

WEBSITE: www.aqtlgroup.com

### CERTIFICATE OF CALIBRATION

|  |                 |                |
|--|-----------------|----------------|
| Apex Testing & Certification Ltd.<br>Unit D6A, 10/F, TML Tower, 3 Hoi Shing<br>Road, Tsuen Wan, N.T., HK | Test Report No. | 201108MCA-126F |
|  | Date of Issue   | 12-Nov-20      |
|  | Date of Testing | 8-Nov-20       |
|  | Page            | 1 of 1         |

#### Item for Calibration

|              |                                    |
|--------------|------------------------------------|
| Description  | : Laser Dust Monitor               |
| Manufacturer | : Sibata Scientific Technology Ltd |
| Model No.    | : LD-3B                            |
| Serial No.   | : 235811                           |

#### Standard Equipment

|                  |   |
|------------------|---|
| Description      | : High Volume Sampler / Calibration Orifice |
| Manufacturer     | : Tisch Environmental, Inc.                 |
| Model No.        | : TE-5170 / TE-5025A                        |
| Serial No.       | : 4344 / 3543                               |
| Last Calibration | : 8-Nov-20 / 2-Nov-20                       |

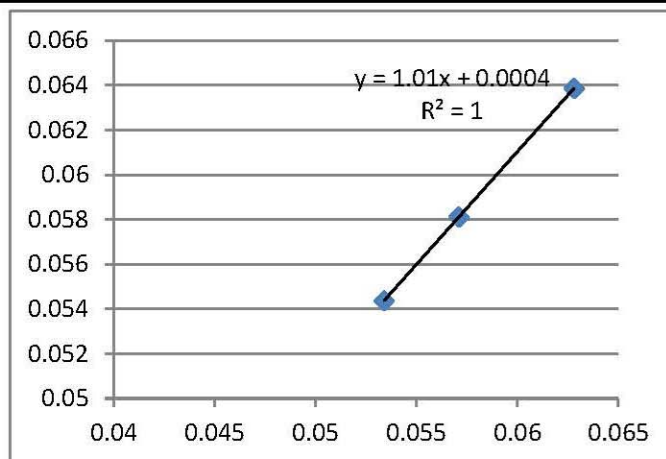
| Date     | Time  | Mean Temp<br>(°C) | Mean<br>Pressure<br>(hPa) | Concentration<br>Standard<br>Equipment<br>(mg/m3) | Concentration<br>Calibrated<br>Equipment<br>(mg/m3) |
|----------|-------|-------------------|---------------------------|---|---|
| 8-Nov-20 | 20:15 | 25.7              | 1017.2                    | 0.0628  | 0.0639  |
| 8-Nov-20 | 21:20 | 25.7              | 1017.2                    | 0.0534  | 0.0544  |
| 8-Nov-20 | 22:25 | 25.7              | 1017.2                    | 0.0571  | 0.0581  |

By Linear Regression of Y or X

Slope (K-factor) : 1.0100

Correlation Coefficient : 1.0000

Validity of Calibration : 7-Nov-21



Recorded by : Jessica Liu

Signature:

Date: 8-Nov-20

Checked by : S Tang

Signature:

Date: 8-Nov-20



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香港新界粉嶺坪輦路啟芳園11A&amp;11B號

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TEL : 852-3582-9589 FAX : 852-2674-1177 EMAIL : cal.aqtl@gmail.com WEBSITE: www.aqtlgroup.com

**CERTIFICATE OF CALIBRATION**

Report Number : 201108MCA-123F  
 Date of Report : 12-Nov-20  
 Page Number : 1 of 2  
 Customer \* : Apex Testing & Certification Ltd.  
 Customer Address\* : Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK  
 Customers Ref. \* : A005

**Item Under Calibration (IUC)\***

Equipment No. : N/A  
 Manufacturer : Sibata Scientific Technology Ltd  
 Model No. : LD-3B  
 Serial No. : 336338  
 Scale Division : 0.001 mg/m<sup>3</sup>  
 Range : 0.001 to 1 mg/m<sup>3</sup>  
 Condition of Item : Normal

Date Item Received : 8-Nov-20  
 Date Calibrated : 8-Nov-20  
 Calibration Location : AQuality Calibration Lab.  
 Date of Next Calibration : 7-Nov-21  
 Calibrated By : Jessica Liu

**Test Environment**

Ambient Temperature : 27.5 °C to 23.9 °C  
 Relative Humidity : 51 % to 83 %

**Calibration Results**

| Reference True Reading (mg/m <sup>3</sup> ) | Average IUC Reading (mg/m <sup>3</sup> ) | Correction (mg/m <sup>3</sup> ) | Error of IUC Reading (%) | Expanded Uncertainty (mg/m <sup>3</sup> ) | Coverage Factor K |
|---|--|---------------------------------|--------------------------|---|-------------------|
| 0.158                                       | 0.168                                    | -0.010                          | 5.7%                     | 0.026                                     | 2.0               |
| 5.164                                       | 5.562                                    | -0.398                          | 7.1%                     | 0.462                                     | 2.0               |
| 10.100                                      | 10.936                                   | -0.837                          | 7.6%                     | 0.905                                     | 2.0               |

**Remarks :**

- \* Denotes information supplied by customer.
- The results relate only to the items calibrated.
- The results apply to the items as received.
- Correction = Average of (Ref reading - IUC reading)
- The technical requirement of laser dust meter. +/- 20% error for the particles concentration.

Approved by: \_\_\_\_\_

LEE Mei Yee, Julia  
 Managing Director



東恒測試顧問有限公司

AQUALITY TESTCONSULT LIMITED

香港新界粉嶺坪輦路啟芳園11A&11B號

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TEL : 852-3582-9589 FAX : 852-2674-1177 EMAIL : cal.aqtl@gmail.com WEBSITE: www.aqtlgroup.com

### **CERTIFICATE OF CALIBRATION**

Report Number : 201108MCA-123F  
Date of Report : 12-Nov-20  
Page Number : 2 of 2  
Customer \* : Apex Testing & Certification Ltd.  
Customers Ref. \* : A005

#### **Details of Calibration**

1. The calibration was performed in accordance with AQuality Testconsult Procedure Number ENV-L-003 (in-house method), by comparison with the laboratory's reference equipment which have traceable international standards of measurement.
2. The item under calibration (IUC) was allowed to stabilize in the laboratory for 0.25 hour before commencement of calibration.
3. A set of readings were made at each calibration concentration. The values quoted in the results are the average of each set of readings.
4. The values given in this calibration certificate only relate to the values measured at the time of calibration. Any uncertainties quoted do not include allowance for the capability of any other laboratory to repeat the measurement. The uncertainty quoted relate only to item at time of calibration. AQuality Testconsult Limited is not liable for any loss or damage resulting from the use of this equipment.
5. The identification, calibration certificate numbers for the reference equipment used were as follows :

| <u>Equipment Number</u> | <u>Certificate Number</u> | <u>Description</u> |
|-------------------------|---------------------------|--------------------|
| CH-LDM-1                | HBW202001563              | 粉尘测试仪              |

6. Copies of the Calibration certificates of the reference equipment used in this calibration may be obtained from AQuality Testconsult Limited, if necessary.

- End of Report -



東恒測試顧問有限公司

AQUALITY TESTCONSULT LIMITED

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FAX : 852-2674-1177

EMAIL : cal.aqtl@gmail.com

WEBSITE: www.aqtlgroup.com

### CERTIFICATE OF CALIBRATION

|  |                 |                |
|--|-----------------|----------------|
| Apex Testing & Certification Ltd.<br>Unit D6A, 10/F, TML Tower, 3 Hoi Shing<br>Road, Tsuen Wan, N.T., HK | Test Report No. | 201108MCA-123F |
|  | Date of Issue   | 12-Nov-20      |
|  | Date of Testing | 8-Nov-20       |
|  | Page            | 1 of 1         |

#### Item for Calibration

|              |                                    |
|--------------|------------------------------------|
| Description  | : Laser Dust Monitor               |
| Manufacturer | : Sibata Scientific Technology Ltd |
| Model No.    | : LD-3B                            |
| Serial No.   | : 336338                           |

#### Standard Equipment

|                  |   |
|------------------|---|
| Description      | : High Volume Sampler / Calibration Orifice |
| Manufacturer     | : Tisch Environmental, Inc.                 |
| Model No.        | : TE-5170 / TE-5025A                        |
| Serial No.       | : 4344 / 3543                               |
| Last Calibration | : 8-Nov-20 / 2-Nov-20                       |

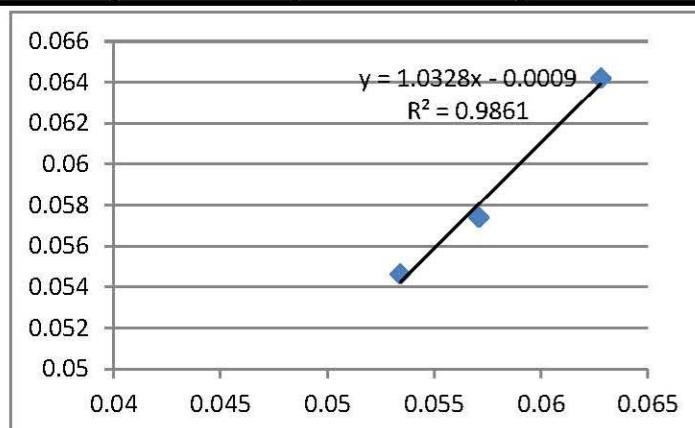
| Date     | Time  | Mean Temp<br>(°C) | Mean Pressure<br>(hPa) | Concentration Standard<br>Equipment<br>(mg/m3) | Concentration Calibrated<br>Equipment<br>(mg/m3) |
|----------|-------|-------------------|------------------------|--|--|
| 8-Nov-20 | 20:15 | 25.7              | 1017.2                 | 0.0628   | 0.0642   |
| 8-Nov-20 | 21:20 | 25.7              | 1017.2                 | 0.0534   | 0.0546   |
| 8-Nov-20 | 22:25 | 25.7              | 1017.2                 | 0.0571   | 0.0574   |

By Linear Regression of Y or X

Slope (K-factor) : 1.0328

Correlation Coefficient : 0.9861

Validity of Calibration : 7-Nov-21



Recorded by : Jessica Liu Signature:  Date: 8-Nov-20

Checked by : S Tang Signature:  Date: 8-Nov-20





### CERTIFICATE OF CALIBRATION

Report Number : 201108MCA-125F  
Date of Report : 12-Nov-20  
Page Number : 1 of 2  
Customer \* : Apex Testing & Certification Ltd.  
Customer Address\* : Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK  
Customers Ref. \* : A005

#### Item Under Calibration (IUC)\*

Equipment No. : N/A  
Manufacturer : Sibata Scientific Technology Ltd  
Model No. : LD-3B  
Serial No. : 567188  
Scale Division : 0.001 mg/m<sup>3</sup>  
Range : 0.001 to 1 mg/m<sup>3</sup>  
Condition of Item : Normal

Date Item Received : 8-Nov-20  
Date Calibrated : 8-Nov-20  
Calibration Location : AQuality Calibration Lab.  
Date of Next Calibration : 7-Nov-21  
Calibrated By : Jessica Liu

#### Test Environment

Ambient Temperature : 27.5 °C to 23.9 °C  
Relative Humidity : 51 % to 83 %

### Calibration Results

| Reference True Reading (mg/m <sup>3</sup> ) | Average IUC Reading (mg/m <sup>3</sup> ) | Correction (mg/m <sup>3</sup> ) | Error of IUC Reading (%) | Expanded Uncertainty (mg/m <sup>3</sup> ) | Coverage Factor K |
|---|--|---------------------------------|--------------------------|---|-------------------|
| 0.158                                       | 0.167                                    | -0.008                          | 4.9%                     | 0.023                                     | 2.0               |
| 5.164                                       | 5.693                                    | -0.530                          | 9.3%                     | 0.463                                     | 2.0               |
| 10.100                                      | 11.045                                   | -0.945                          | 8.6%                     | 0.905                                     | 2.0               |

#### Remarks

- :  
1. \* Denotes information supplied by customer.  
2. The results relate only to the items calibrated.  
3. The results apply to the items as received.  
4. Correction = Average of (Ref reading - IUC reading)  
5. The technical requirement of laser dust meter. +/- 20% error for the particles concentration.

Approved by:

LEE Mei Yee, Julia  
Managing Director



**CERTIFICATE OF CALIBRATION**

Report Number : 201108MCA-125F  
Date of Report : 12-Nov-20  
Page Number : 2 of 2  
Customer \* : Apex Testing & Certification Ltd.  
Customers Ref. \* : A005

**Details of Calibration**

1. The calibration was performed in accordance with AQuality Testconsult Procedure Number ENV-L-003 (in-house method), by comparison with the laboratory's reference equipment which have traceable international standards of measurement.
2. The item under calibration (IUC) was allowed to stabilize in the laboratory for 0.25 hour before commencement of calibration.
3. A set of readings were made at each calibration concentration. The values quoted in the results are the average of each set of readings.
4. The values given in this calibration certificate only relate to the values measured at the time of calibration. Any uncertainties quoted do not include allowance for the capability of any other laboratory to repeat the measurement. The uncertainty quoted relate only to item at time of calibration. AQuality Testconsult Limited is not liable for any loss or damage resulting from the use of this equipment.
5. The identification, calibration certificate numbers for the reference equipment used were as follows :

| <u>Equipment Number</u> | <u>Certificate Number</u> | <u>Description</u> |
|-------------------------|---------------------------|--------------------|
| CH-LDM-1                | HBW202001563              | 粉尘测试仪              |

6. Copies of the Calibration certificates of the reference equipment used in this calibration may be obtained from AQuality Testconsult Limited, if necessary.

- End of Report -



東恒測試顧問有限公司

AQUALITY TESTCONSULT LIMITED

香港新界粉嶺坪輦路啟芳園11A&11B號

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WEBSITE: www.aqtlgroup.com

### CERTIFICATE OF CALIBRATION

|  |                 |                |
|--|-----------------|----------------|
| Apex Testing & Certification Ltd.<br>Unit D6A, 10/F, TML Tower, 3 Hoi<br>Shing Road, Tsuen Wan, N.T., HK | Test Report No. | 201108MCA-125F |
|  | Date of Issue   | 12-Nov-20      |
|  | Date of Testing | 8-Nov-20       |
|  | Page            | 1 of 1         |

#### Item for Calibration

|              |                                    |
|--------------|------------------------------------|
| Description  | : Laser Dust Monitor               |
| Manufacturer | : Sibata Scientific Technology Ltd |
| Model No.    | : LD-3B                            |
| Serial No.   | : 567188                           |

#### Standard Equipment

|                  |   |
|------------------|---|
| Description      | : High Volume Sampler / Calibration Orifice |
| Manufacturer     | : Tisch Environmental, Inc.                 |
| Model No.        | : TE-5170 / TE-5025A                        |
| Serial No.       | : 4344 / 3543                               |
| Last Calibration | : 8-Nov-20 / 2-Nov-20                       |

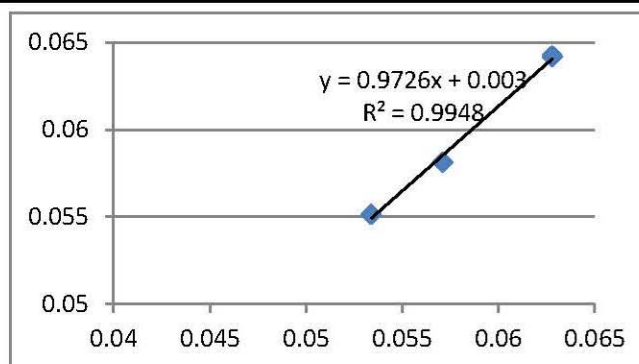
| Date     | Time  | Mean Temp<br>(°C) | Mean Pressure<br>(hPa) | Concentration<br>Standard<br>Equipment<br>(mg/m3) | Concentration<br>Calibrated<br>Equipment<br>(mg/m3) |
|----------|-------|-------------------|------------------------|---|---|
| 8-Nov-20 | 20:15 | 25.7              | 1017.2                 | 0.0628  | 0.0642  |
| 8-Nov-20 | 21:20 | 25.7              | 1017.2                 | 0.0534  | 0.0552  |
| 8-Nov-20 | 22:25 | 25.7              | 1017.2                 | 0.0571  | 0.0581  |

By Linear Regression of Y or X

Slope (K-factor) : 0.9726

Correlation Coefficient : 0.9948

Validity of Calibration : 7-Nov-21



Recorded by : Jessica Liu

Signature:

Date: 8-Nov-20

Checked by : S Tang

Signature:

Date: 8-Nov-20



## CERTIFICATE OF CALIBRATION

Certificate No.: 20CA1005 01-05

Page 1 of 2

### Item tested

|                       |                                     |            |
|-----------------------|-------------------------------------|------------|
| Description:          | Sound Level Meter (Class 1)         | Microphone |
| Manufacturer:         | Hangzhou Aihua Instruments Co., Ltd | -          |
| Type/Model No.:       | AWA5661                             | AWA14425   |
| Serial/Equipment No.: | 301135                              | 15338      |
| Adaptors used:        | -                                   | -          |

### Item submitted by

|                      |  |
|----------------------|--|
| Customer Name:       | Apex Testing & Certification Ltd.                            |
| Address of Customer: | Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T. |
| Request No.:         | -  |
| Date of receipt:     | 05-Oct-2020  |

Date of test: 09-Oct-2020

### Reference equipment used in the calibration

| Description:                    | Model:   | Serial No. | Expiry Date: | Traceable to: |
|---------------------------------|----------|------------|--------------|---------------|
| Multi function sound calibrator | B&K 4226 | 2288444    | 23-Aug-2021  | CIGISMEC      |
| Signal generator                | DS 360   | 61227      | 24-Dec-2020  | CEPREI        |

### Ambient conditions

|                    |              |
|--------------------|--------------|
| Temperature:       | 22 ± 1 °C    |
| Relative humidity: | 55 ± 10 %    |
| Air pressure:      | 1005 ± 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 responsess 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 Junqi

Date: 10-Oct-2020

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. The results apply to the item as received.



**CERTIFICATE OF CALIBRATION**

(Continuation Page)

Certificate No.:

20CA1005 01-05

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                       |                 |
| Linearity range for SPL | At reference range, Step 5 dB at 4 kHz           | Pass    | 0.3                       |                 |
|                         | Frequency weightings                             | A       | Pass                      |                 |
|                         |  | C       | Pass                      |                 |
|                         |  | Lin     | Pass                      |                 |
| Time weightings         | Single Burst Fast                                | Pass    | 0.3                       |                 |
|                         | Single Burst Slow                                | Pass    | 0.3                       |                 |
| Peak response           | Single 100µs rectangular pulse                   | Pass    | 0.3                       |                 |
| R.M.S. accuracy         | Crest factor of 3                                | Pass    | 0.3                       |                 |
| Time weighting I        | Single burst 5 ms at 2000 Hz                     | Pass    | 0.3                       |                 |
|                         | Repeated at frequency of 100 Hz                  | Pass    | 0.3                       |                 |
| Time averaging          | 1 ms burst duty factor 1/10 <sup>3</sup> at 4kHz | Pass    | 0.3                       |                 |
|                         | 1 ms burst duty factor 1/10 <sup>4</sup> at 4kHz | Pass    | 0.3                       |                 |
| Pulse range             | Single burst 10 ms at 4 kHz                      | Pass    | 0.4                       |                 |
| Sound exposure level    | Single burst 10 ms at 4 kHz                      | Pass    | 0.4                       |                 |
| Overload indication     | SPL  | Pass    | 0.3                       |                 |
|                         | 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.

- End -

Calibrated by:

Fung Chi Yip

Date: 09-Oct-2020

Checked by:

Feng Junqi

Date: 10-Oct-2020

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.



Test Data for Sound Level Meter

Page 1 of 5

Sound level meter type: AWA5661  
Microphone type: AWA14425

Serial No. 301135  
Serial No. 15338

Date 09-Oct-2020

Report: 20CA1005 01-05

## SELF GENERATED NOISE TEST

The noise test is performed in the most sensitive range of the SLM with the microphone replaced by an equivalent impedance.

|                            |      |    |
|----------------------------|------|----|
| Noise level in A weighting | 12.3 | dB |
| Noise level in C weighting | 13.6 | dB |
| Noise level in Lin         | 18.2 | dB |

## LINEARITY TEST

The linearity is tested relative to the reference sound pressure level using a continuous sinusoidal signal of frequency 4 kHz. The measurement is made on the reference range for indications at 5 dB intervals starting from the 94 dB reference sound pressure level. And until within 5 dB of the upper and lower limits of the reference range, the measurements shall be made at 1 dB intervals.(SLM set to LEQ/SPL)

| Reference/Expected level | Actual level   |            | Tolerance | Deviation      |            |
|--------------------------|----------------|------------|-----------|----------------|------------|
|                          | non-integrated | integrated |           | non-integrated | integrated |
| dB                       | dB             | dB         | +/- dB    | dB             | dB         |
| 94.0                     | 94.0           | 94.0       | 0.7       | 0.0            | 0.0        |
| 99.0                     | 98.9           | 98.9       | 0.7       | -0.1           | -0.1       |
| 104.0                    | 103.9          | 103.9      | 0.7       | -0.1           | -0.1       |
| 109.0                    | 108.9          | 108.9      | 0.7       | -0.1           | -0.1       |
| 114.0                    | 113.9          | 113.9      | 0.7       | -0.1           | -0.1       |
| 115.0                    | 114.9          | 114.9      | 0.7       | -0.1           | -0.1       |
| 116.0                    | 115.9          | 115.9      | 0.7       | -0.1           | -0.1       |
| 117.0                    | 116.9          | 116.9      | 0.7       | -0.1           | -0.1       |
| 118.0                    | 117.9          | 117.9      | 0.7       | -0.1           | -0.1       |
| 119.0                    | 118.9          | 118.9      | 0.7       | -0.1           | -0.1       |
| 120.0                    | 119.9          | 119.9      | 0.7       | -0.1           | -0.1       |
| 89.0                     | 89.0           | 89.0       | 0.7       | 0.0            | 0.0        |
| 84.0                     | 84.0           | 84.0       | 0.7       | 0.0            | 0.0        |
| 79.0                     | 79.0           | 79.0       | 0.7       | 0.0            | 0.0        |
| 74.0                     | 74.0           | 74.0       | 0.7       | 0.0            | 0.0        |
| 69.0                     | 69.0           | 69.0       | 0.7       | 0.0            | 0.0        |
| 64.0                     | 64.0           | 64.0       | 0.7       | 0.0            | 0.0        |
| 59.0                     | 59.0           | 59.0       | 0.7       | 0.0            | 0.0        |
| 54.0                     | 54.1           | 54.1       | 0.7       | 0.1            | 0.1        |
| 49.0                     | 49.0           | 49.0       | 0.7       | 0.0            | 0.0        |
| 44.0                     | 44.0           | 44.0       | 0.7       | 0.0            | 0.0        |
| 39.0                     | 39.0           | 39.0       | 0.7       | 0.0            | 0.0        |
| 34.0                     | 34.0           | 34.0       | 0.7       | 0.0            | 0.0        |
| 29.0                     | 29.0           | 29.0       | 0.7       | 0.0            | 0.0        |
| 28.0                     | 28.0           | 28.0       | 0.7       | 0.0            | 0.0        |



Test Data for Sound Level Meter

Page 2 of 5

Sound level meter type: AWA5661 Serial No. 301135 Date 09-Oct-2020  
Microphone type: AWA14425 Serial No. 15338  
Report: 20CA1005 01-05

|      |      |      |     |     |     |
|------|------|------|-----|-----|-----|
| 27.0 | 27.1 | 27.1 | 0.7 | 0.1 | 0.1 |
|------|------|------|-----|-----|-----|

Measurements for an indication of the reference SPL on all other ranges which include it

| Other ranges | Expected level | Actual level | Tolerance | Deviation |
|--------------|----------------|--------------|-----------|-----------|
| dB           | dB             | dB           | +/- dB    | dB        |
| 27-120       | 94.0           | 94.0         | 0.7       | 0.0       |
| 45-140       | 94.0           | 93.9         | 0.7       | -0.1      |

Measurements on all level ranges for indications 2 dB below the upper limit and 2 dB above the lower limit

| Ranges | Reference/Expected level | Actual level | Tolerance | Deviation |
|--------|--------------------------|--------------|-----------|-----------|
| dB     | dB                       | dB           | +/- dB    | dB        |
| 27-120 | 29.0                     | 29.0         | 0.7       | 0.0       |
|        | 118.0                    | 117.9        | 0.7       | -0.1      |
| 45-140 | 47.0                     | 47.1         | 0.7       | 0.1       |
|        | 138.0                    | 137.8        | 0.7       | -0.2      |

## FREQUENCY WEIGHTING TEST

The frequency response of the weighting networks are tested at octave intervals over the frequency ranges 31.5 Hz to 12500 Hz. The signal level at 1000 Hz is set to give an indication of the reference SPL.

Frequency weighting A:

| Frequency | Ref. level | Expected level | Actual level | Tolerance(dB) |     | Deviation |
|-----------|------------|----------------|--------------|---------------|-----|-----------|
| Hz        | dB         | dB             | dB           | +             | -   | dB        |
| 1000.0    | 94.0       | 94.0           | 94.0         | 0.0           | 0.0 | 0.0       |
| 31.6      | 94.0       | 54.6           | 54.4         | 1.5           | 1.5 | -0.2      |
| 63.1      | 94.0       | 67.8           | 67.7         | 1.5           | 1.5 | -0.1      |
| 125.9     | 94.0       | 77.9           | 77.8         | 1.0           | 1.0 | -0.1      |
| 251.2     | 94.0       | 85.4           | 85.3         | 1.0           | 1.0 | -0.1      |
| 501.2     | 94.0       | 90.8           | 90.7         | 1.0           | 1.0 | -0.1      |
| 1995.0    | 94.0       | 95.2           | 95.3         | 1.0           | 1.0 | 0.1       |
| 3981.0    | 94.0       | 95.0           | 95.3         | 1.0           | 1.0 | 0.3       |
| 7943.0    | 94.0       | 92.9           | 93.6         | 1.5           | 3.0 | 0.7       |
| 12590.0   | 94.0       | 89.7           | 89.4         | 3.0           | 6.0 | -0.3      |

Frequency weighting C:

| Frequency | Ref. level | Expected level | Actual level | Tolerance(dB) |     | Deviation |
|-----------|------------|----------------|--------------|---------------|-----|-----------|
| Hz        | dB         | dB             | dB           | +             | -   | dB        |
| 1000.0    | 94.0       | 94.0           | 94.0         | 0.0           | 0.0 | 0.0       |
| 31.6      | 94.0       | 91.0           | 90.9         | 1.5           | 1.5 | -0.1      |
| 63.1      | 94.0       | 93.2           | 93.1         | 1.5           | 1.5 | -0.1      |
| 125.9     | 94.0       | 93.8           | 93.8         | 1.0           | 1.0 | 0.0       |
| 251.2     | 94.0       | 94.0           | 94.0         | 1.0           | 1.0 | 0.0       |
| 501.2     | 94.0       | 94.0           | 94.0         | 1.0           | 1.0 | 0.0       |





Test Data for Sound Level Meter

Page 3 of 5

Sound level meter type: AWA5661 Serial No. 301135 Date 09-Oct-2020  
Microphone type: AWA14425 Serial No. 15338  
Report: 20CA1005 01-05

|         |      |      |      |     |     |      |
|---------|------|------|------|-----|-----|------|
| 1995.0  | 94.0 | 93.8 | 93.9 | 1.0 | 1.0 | 0.1  |
| 3981.0  | 94.0 | 93.2 | 93.5 | 1.0 | 1.0 | 0.3  |
| 7943.0  | 94.0 | 91.0 | 91.7 | 1.5 | 3.0 | 0.7  |
| 12590.0 | 94.0 | 87.8 | 87.5 | 3.0 | 6.0 | -0.3 |

Frequency weighting Lin:

| Frequency | Ref. level | Expected level | Actual level | Tolerance(dB) |     | Deviation |
|-----------|------------|----------------|--------------|---------------|-----|-----------|
| Hz        | dB         | dB             | dB           | +             | -   | dB        |
| 1000.0    | 94.0       | 94.0           | 94.0         | 0.0           | 0.0 | 0.0       |
| 31.6      | 94.0       | 94.0           | 93.9         | 1.5           | 1.5 | -0.1      |
| 63.1      | 94.0       | 94.0           | 93.9         | 1.5           | 1.5 | -0.1      |
| 125.9     | 94.0       | 94.0           | 94.0         | 1.0           | 1.0 | 0.0       |
| 251.2     | 94.0       | 94.0           | 94.0         | 1.0           | 1.0 | 0.0       |
| 501.2     | 94.0       | 94.0           | 94.0         | 1.0           | 1.0 | 0.0       |
| 1995.0    | 94.0       | 94.0           | 94.0         | 1.0           | 1.0 | 0.0       |
| 3981.0    | 94.0       | 94.0           | 94.0         | 1.0           | 1.0 | 0.0       |
| 7943.0    | 94.0       | 94.0           | 94.0         | 1.5           | 3.0 | 0.0       |
| 12590.0   | 94.0       | 94.0           | 93.9         | 3.0           | 6.0 | -0.1      |

TIME WEIGHTING FAST TEST

Time weighting F is tested on the reference range with a single sinusoidal burst of duration 200 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

| Ref. level | Expected level | Actual level | Tolerance(dB) |     | Deviation |
|------------|----------------|--------------|---------------|-----|-----------|
| dB         | dB             | dB           | +             | -   | dB        |
| 116.0      | 115.0          | 114.9        | 1.0           | 1.0 | -0.1      |

TIME WEIGHTING SLOW TEST

Time weighting S is tested on the reference range with a single sinusoidal burst of duration 500 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

| Ref. level | Expected level | Actual level | Tolerance(dB) |     | Deviation |
|------------|----------------|--------------|---------------|-----|-----------|
| dB         | dB             | dB           | +             | -   | dB        |
| 116.0      | 111.9          | 111.9        | 1.0           | 1.0 | 0.0       |

PEAK RESPONSE TEST

The onset time of the peak detector is tested on the reference range by comparing the response to a 100 us rectangular test pulse with the response to a 10 ms reference pulse of the same amplitude. The amplitude of the 10 ms reference pulse is such as to produce an indication 1 dB below the upper limit of the primary indicator range.

Positive polarities: (Weighting Z, set the generator signal to single, Lzpeak)

| Ref. level | Response to 10 ms | Response to 100 us | Tolerance | Deviation |
|------------|-------------------|--------------------|-----------|-----------|
| dB         | dB                | dB                 | +/- dB    | dB        |
| 119.0      | 119.0             | 119.5              | 2.0       | 0.5       |



Test Data for Sound Level Meter

Page 4 of 5

Sound level meter type: AWA5661 Serial No. 301135 Date 09-Oct-2020  
Microphone type: AWA14425 Serial No. 15338  
Report: 20CA1005 01-05

Negative polarities:

| Ref. level | Response to 10 ms | Response to 100 us | Tolerance | Deviation |
|------------|-------------------|--------------------|-----------|-----------|
| dB         | dB                | dB                 | +/- dB    | dB        |
| 119.0      | 119.0             | 119.5              | 2.0       | 0.5       |

RMS ACCURACY TEST

The RMS detector accuracy is tested on the reference range for a crest factor of 3.

Test frequency: 2000 Hz  
Amplitude: 2 dB below the upper limit of the primary indicator range.  
Burst repetition frequency: 40 Hz  
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz. (Set to INT)

|                | Ref. Level | Expected level | Tone burst signal | Tolerance | Deviation |
|----------------|------------|----------------|-------------------|-----------|-----------|
| Time weighting | dB         | dB             | indication(dB)    | +/- dB    | dB        |
| Slow           | 117.0+6.6  | 117.0          | 116.6             | 0.5       | -0.4      |

TIME WEIGHTING IMPULSE TEST

Time weighting I is tested on the reference range (Set the SLM to LAImax)

Test frequency: 2000 Hz  
Amplitude: The upper limit of the primary indicator range.

Single sinusoidal burst of duration 5 ms:

| Ref. Level | Single burst indication |             | Tolerance | Deviation |
|------------|-------------------------|-------------|-----------|-----------|
| dB         | Expected (dB)           | Actual (dB) | +/- dB    | dB        |
| 120.0      | 111.2                   | 111.1       | 2.0       | -0.1      |

Repeated at 100 Hz

| Ref. Level | Repeated burst indication |             | Tolerance | Deviation |
|------------|---------------------------|-------------|-----------|-----------|
| dB         | Expected (dB)             | Actual (dB) | +/- dB    | dB        |
| 120.0      | 117.3                     | 117.1       | 1.0       | -0.2      |

TIME AVERAGING TEST

This test compares the SLM reading for continuous sine signals with readings obtained from a sine tone burst sequence having the same RMS level. The test level is 30 dB below the upper limit of the linearity range and repeated for Type 1 SLM with 40 dB below the upper limit of the linearity.

Frequency of tone burst: 4000 Hz

Duration of tone burst: 1 ms

| Repetition Time | Level of tone burst | Expected Leq | Actual Leq | Tolerance | Deviation | Remarks      |
|-----------------|---------------------|--------------|------------|-----------|-----------|--------------|
| msec            | dB                  | dB           | dB         | +/- dB    | dB        |              |
| 1000            | 90.0                | 90.0         | 89.9       | 1.0       | -0.1      | 60s integ.   |
| 10000           | 80.0                | 80.0         | 79.9       | 1.0       | -0.1      | 6min. integ. |

PULSE RANGE AND SOUND EXPOSURE LEVEL TEST

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference range

Test frequency: 4000 Hz

Integration time: 10 sec





Test Data for Sound Level Meter

Page 5 of 5

Sound level meter type: AWA5661 Serial No. 301135 Date 09-Oct-2020  
Microphone type: AWA14425 Serial No. 15338  
Report: 20CA1005 01-05

The integrating sound level meter set to Leq:

| Duration | Rms level of    | Expected | Actual | Tolerance | Deviation |
|----------|-----------------|----------|--------|-----------|-----------|
| msec     | tone burst (dB) | dB       | dB     | +/- dB    | dB        |
| 10       | 90.0            | 60.0     | 60.0   | 1.7       | 0.0       |

The integrating sound level meter set to SEL:

| Duration | Rms level of    | Expected | Actual | Tolerance | Deviation |
|----------|-----------------|----------|--------|-----------|-----------|
| msec     | tone burst (dB) | dB       | dB     | +/- dB    | dB        |
| 10.0     | 90.0            | 70.0     | 70.0   | 1.7       | 0.0       |

OVERLOAD INDICATION TEST

For SLM capable of operating in a non-integrating mode.

Test frequency: 2000 Hz  
Amplitude: 2 dB below the upper limit of the primary indicator range.  
Burst repetition frequency: 40 Hz  
Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz.

| Level            | Level reduced by | Further reduced | Difference | Tolerance | Deviation |
|------------------|------------------|-----------------|------------|-----------|-----------|
| at overload (dB) | 1 dB             | 3 dB            | dB         | dB        | dB        |
| 115.7            | 114.7            | 111.7           | 3.0        | 1.0       | 0.0       |

For integrating SLM, with the instrument indicating Leq.

For integrating SLM, with the instrument indicating Leq and set to the reference range. The test signal as following:  
The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference range

Test frequency: 4000 Hz  
Integration time: 10 sec  
Single burst duration: 1 msec

| Rms level        | Level reduced by | Expected level | Actual level | Tolerance | Deviation |
|------------------|------------------|----------------|--------------|-----------|-----------|
| at overload (dB) | 1 dB             | dB             | dB           | dB        | dB        |
| 122.0            | 121.0            | 81.0           | 81.0         | 2.2       | 0.0       |

ACOUSTIC TEST

The acoustic test of the complete SLM is tested at the frequency 125 Hz and 8000 Hz using a B&K type 4226 Multifunction Acoustic Calibrator. The test is performed in A weighting.

| Frequency | Expected level | Actual level  | Tolerance (dB) |     | Deviation |
|-----------|----------------|---------------|----------------|-----|-----------|
| Hz        | dB             | Measured (dB) | +              | -   | dB        |
| 1000      | 94.0           | 94.0          | 0.0            | 0.0 | 0.0       |
| 125       | 77.9           | 78.2          | 1.0            | 1.0 | 0.3       |
| 8000      | 92.9           | 93.6          | 1.5            | 3.0 | 0.7       |

-----END-----



## CERTIFICATE OF CALIBRATION

Certificate No.: 20CA0616 03-02

Page: 1 of 2

### Item tested

Description: Acoustical Calibrator (Class 1)  
Manufacturer: Pulsar  
Type/Model No.: 100B  
Serial/Equipment No.: 039507  
Adaptors used: Yes

### Item submitted by

Customer: Apex Testing & Certification Ltd.  
Address of Customer: Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T.  
Request No.: -  
Date of receipt: 16-Jun-2020

Date of test: 20-Jun-2020

### Reference equipment used in the calibration

| Description:            | Model:   | Serial No. | Expiry Date: | Traceable to: |
|-------------------------|----------|------------|--------------|---------------|
| Lab standard microphone | B&K 4180 | 2412857    | 11-May-2021  | SCL           |
| Preamplifier            | B&K 2673 | 2743150    | 03-Jun-2021  | CEPREI        |
| Measuring amplifier     | B&K 2610 | 2346941    | 03-Jun-2021  | CEPREI        |
| Signal generator        | DS 360   | 33873      | 19-May-2021  | CEPREI        |
| Digital multi-meter     | 34401A   | US36087050 | 19-May-2021  | CEPREI        |
| Audio analyzer          | 8903B    | GB41300350 | 18-May-2021  | CEPREI        |
| Universal counter       | 53132A   | MY40003662 | 18-May-2021  | CEPREI        |

### Ambient conditions

Temperature:  $22 \pm 1$  °C  
Relative humidity:  $55 \pm 10$  %  
Air pressure:  $1005 \pm 5$  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 Junqi

Date: 22-Jun-2020

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.: 20CA0616 03-02

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<br>Shown<br>Hz | Output Sound Pressure<br>Level Setting<br>dB | Measured Output<br>Sound Pressure Level<br>dB | (Output level in dB re 20 µPa)          |
|--------------------------|--|---|---|
|                          |  |   | Estimated Expanded<br>Uncertainty<br>dB |
| 1000                     | 94.00  | 94.10   | 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 = 0.009 dB

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 = 997.6 Hz

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 = 0.9 %

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.

Calibrated by:

Fung Chi Yip

Date: 20-Jun-2020

- End -

Checked by:

Shek Kwong Tat

Date: 22-Jun-2020

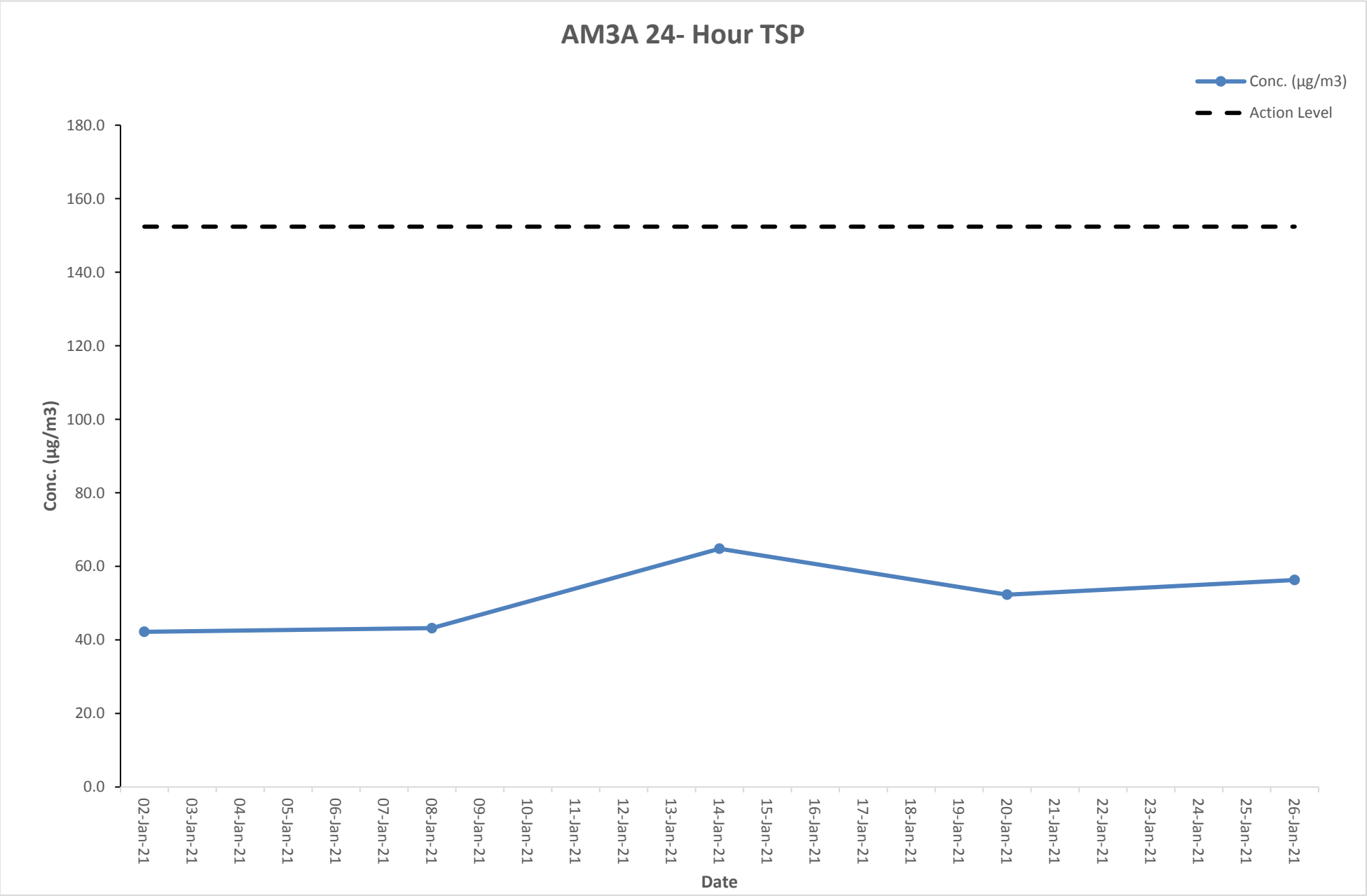
The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

## **G. Graphical Plots of the Monitoring Results**

**Air Quality Monitoring Result at Station AM3A (24-hour TSP)**

| Start     |         | Finish    |         | Filter Weight (g) |        | Elapsed Time Reading |        | Sampling Time (hrs) | Flow Rate (m <sup>3</sup> /min) |       |         | Conc. (µg/m3) | Weather Condition | Action Level | Limit Level |
|-----------|---------|-----------|---------|-------------------|--------|----------------------|--------|---------------------|---------------------------------|-------|---------|---------------|-------------------|--------------|-------------|
| Date      | Time    | Date      | Time    | Initial           | Final  | Initial              | Final  |                     | Initial                         | Final | Average |               |                   |              |             |
| 02-Jan-21 | 10:00AM | 03-Jan-21 | 10:00AM | 2.8074            | 2.8754 | 1387.8               | 1411.8 | 24                  | 1.12                            | 1.12  | 1.12    | 42.2          | Fine              | 152.4        | 260         |
| 08-Jan-21 | 10:00AM | 09-Jan-21 | 10:00AM | 2.8025            | 2.8720 | 1411.8               | 1435.8 | 24                  | 1.12                            | 1.12  | 1.12    | 43.2          | Fine              | 152.4        | 260         |
| 14-Jan-21 | 10:00AM | 15-Jan-21 | 10:00AM | 2.8029            | 2.9071 | 1435.8               | 1459.8 | 24                  | 1.12                            | 1.12  | 1.12    | 64.8          | Sunny             | 152.4        | 260         |
| 20-Jan-21 | 10:00AM | 21-Jan-21 | 10:00AM | 2.8013            | 2.8854 | 1459.8               | 1483.8 | 24                  | 1.12                            | 1.12  | 1.12    | 52.3          | Fine              | 152.4        | 260         |
| 26-Jan-21 | 10:00AM | 27-Jan-21 | 10:00AM | 2.8086            | 2.8993 | 1483.8               | 1507.8 | 24                  | 1.12                            | 1.12  | 1.12    | 56.3          | Sunny             | 152.4        | 260         |

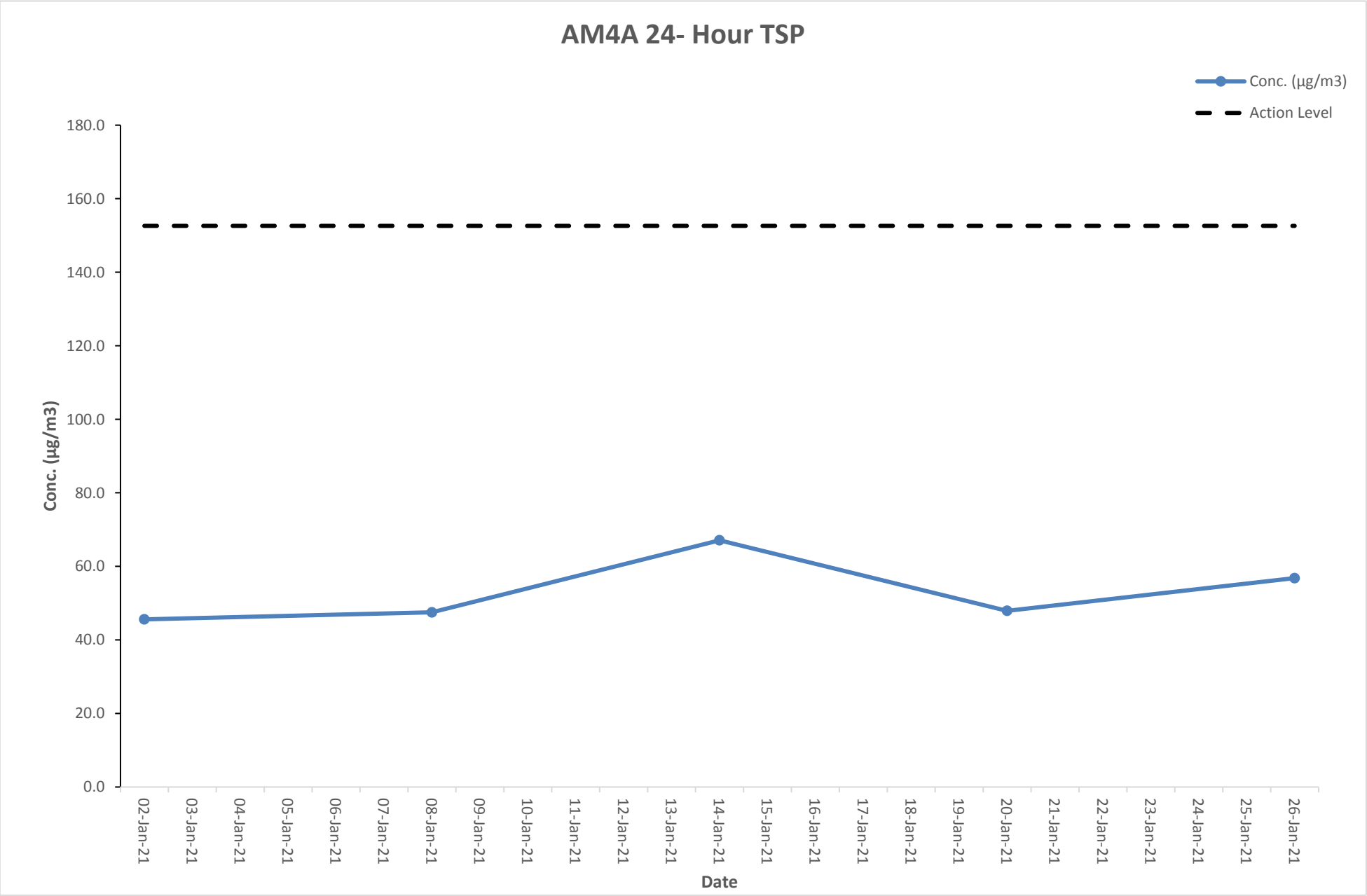
Graphical Presentation of Air Quality Monitoring Result at Station AM3A (24-hour TSP)



**Air Quality Monitoring Result at Station AM4A (24-hour TSP)**

| Start     |         | Finish    |         | Filter Weight (g) |        | Elapsed Time Reading |        | Sampling Time (hrs) | Flow Rate (m <sup>3</sup> /min) |       |         | Conc. (µg/m3) | Weather Condition | Action Level | Limit Level |
|-----------|---------|-----------|---------|-------------------|--------|----------------------|--------|---------------------|---------------------------------|-------|---------|---------------|-------------------|--------------|-------------|
| Date      | Time    | Date      | Time    | Initial           | Final  | Initial              | Final  |                     | Initial                         | Final | Average |               |                   |              |             |
| 02-Jan-21 | 10:00AM | 03-Jan-21 | 10:00AM | 2.8076            | 2.8809 | 1807.4               | 1831.4 | 24                  | 1.12                            | 1.12  | 1.12    | 45.6          | Fine              | 152.6        | 260         |
| 08-Jan-21 | 10:00AM | 09-Jan-21 | 10:00AM | 2.8065            | 2.8830 | 1831.4               | 1855.4 | 24                  | 1.12                            | 1.12  | 1.12    | 47.5          | Fine              | 152.6        | 260         |
| 14-Jan-21 | 10:00AM | 15-Jan-21 | 10:00AM | 2.8041            | 2.9121 | 1855.4               | 1879.4 | 24                  | 1.12                            | 1.12  | 1.12    | 67.1          | Sunny             | 152.6        | 260         |
| 20-Jan-21 | 10:00AM | 21-Jan-21 | 10:00AM | 2.8045            | 2.8816 | 1879.4               | 1903.4 | 24                  | 1.12                            | 1.12  | 1.12    | 47.9          | Fine              | 152.6        | 260         |
| 26-Jan-21 | 10:00AM | 27-Jan-21 | 10:00AM | 2.8013            | 2.8927 | 1903.4               | 1927.4 | 24                  | 1.12                            | 1.12  | 1.12    | 56.8          | Sunny             | 152.6        | 260         |

Graphical Presentation of Air Quality Monitoring Result at Station AM4A (24-hour TSP)

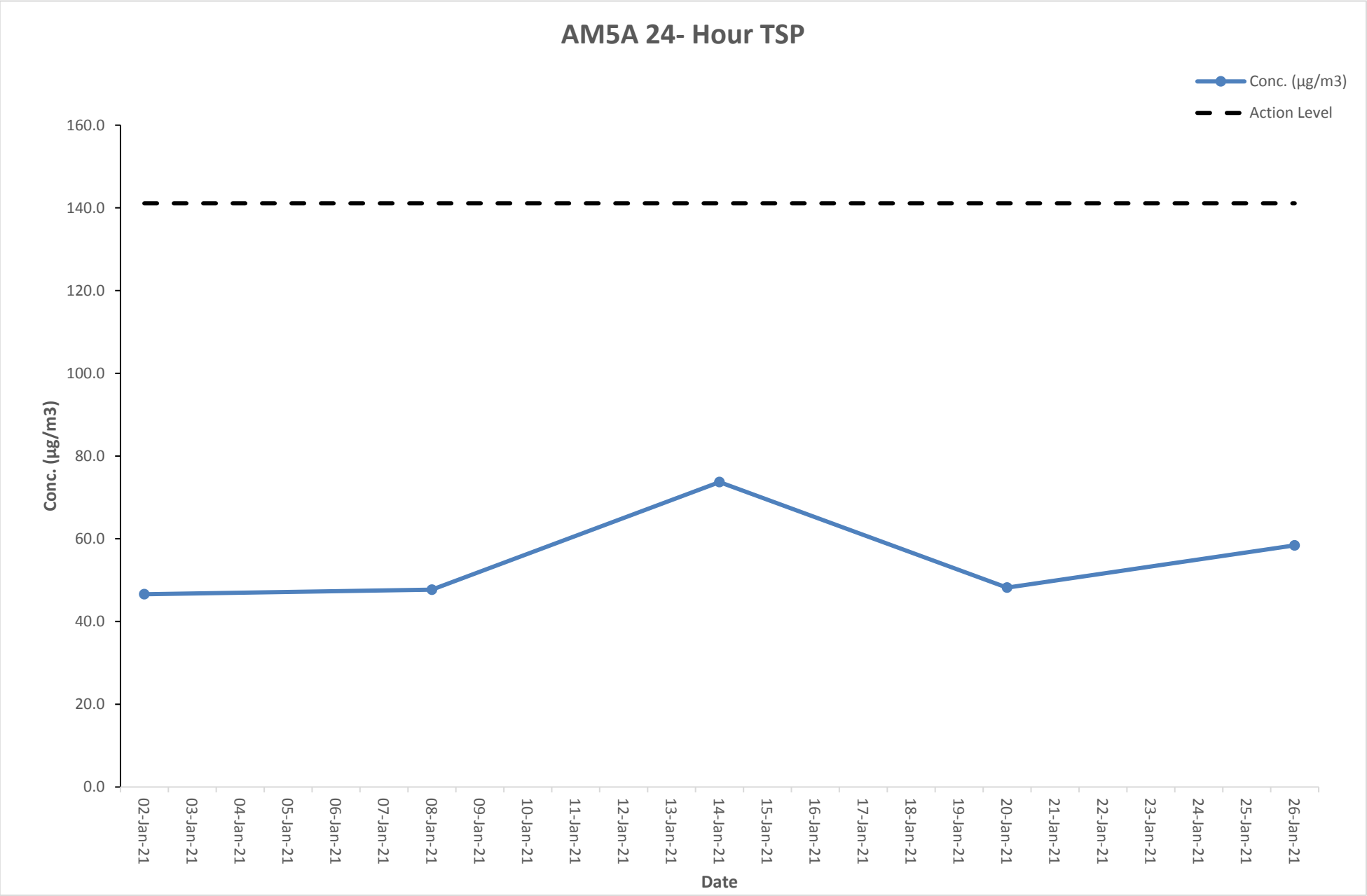




**Air Quality Monitoring Result at Station AM5A (24-hour TSP)**

| Start     |         | Finish    |         | Filter Weight (g) |        | Elapsed Time Reading |        | Sampling Time (hrs) | Flow Rate (m <sup>3</sup> /min) |       |         | Conc. (µg/m3) | Weather Condition | Action Level | Limit Level |
|-----------|---------|-----------|---------|-------------------|--------|----------------------|--------|---------------------|---------------------------------|-------|---------|---------------|-------------------|--------------|-------------|
| Date      | Time    | Date      | Time    | Initial           | Final  | Initial              | Final  |                     | Initial                         | Final | Average |               |                   |              |             |
| 02-Jan-21 | 10:00AM | 03-Jan-21 | 10:00AM | 2.8064            | 2.8813 | 1947.6               | 1971.6 | 24                  | 1.12                            | 1.12  | 1.12    | 46.6          | Fine              | 141.1        | 260         |
| 08-Jan-21 | 10:00AM | 09-Jan-21 | 10:00AM | 2.8075            | 2.8844 | 1971.6               | 1995.6 | 24                  | 1.12                            | 1.12  | 1.12    | 47.7          | Fine              | 141.1        | 260         |
| 14-Jan-21 | 10:00AM | 15-Jan-21 | 10:00AM | 2.8071            | 2.9257 | 1995.6               | 2019.6 | 24                  | 1.12                            | 1.12  | 1.12    | 73.7          | Sunny             | 141.1        | 260         |
| 20-Jan-21 | 10:00AM | 21-Jan-21 | 10:00AM | 2.8048            | 2.8824 | 2019.6               | 2043.6 | 24                  | 1.12                            | 1.12  | 1.12    | 48.2          | Fine              | 141.1        | 260         |
| 26-Jan-21 | 10:00AM | 27-Jan-21 | 10:00AM | 2.8014            | 2.8954 | 2043.6               | 2067.6 | 24                  | 1.12                            | 1.12  | 1.12    | 58.4          | Sunny             | 141.1        | 260         |

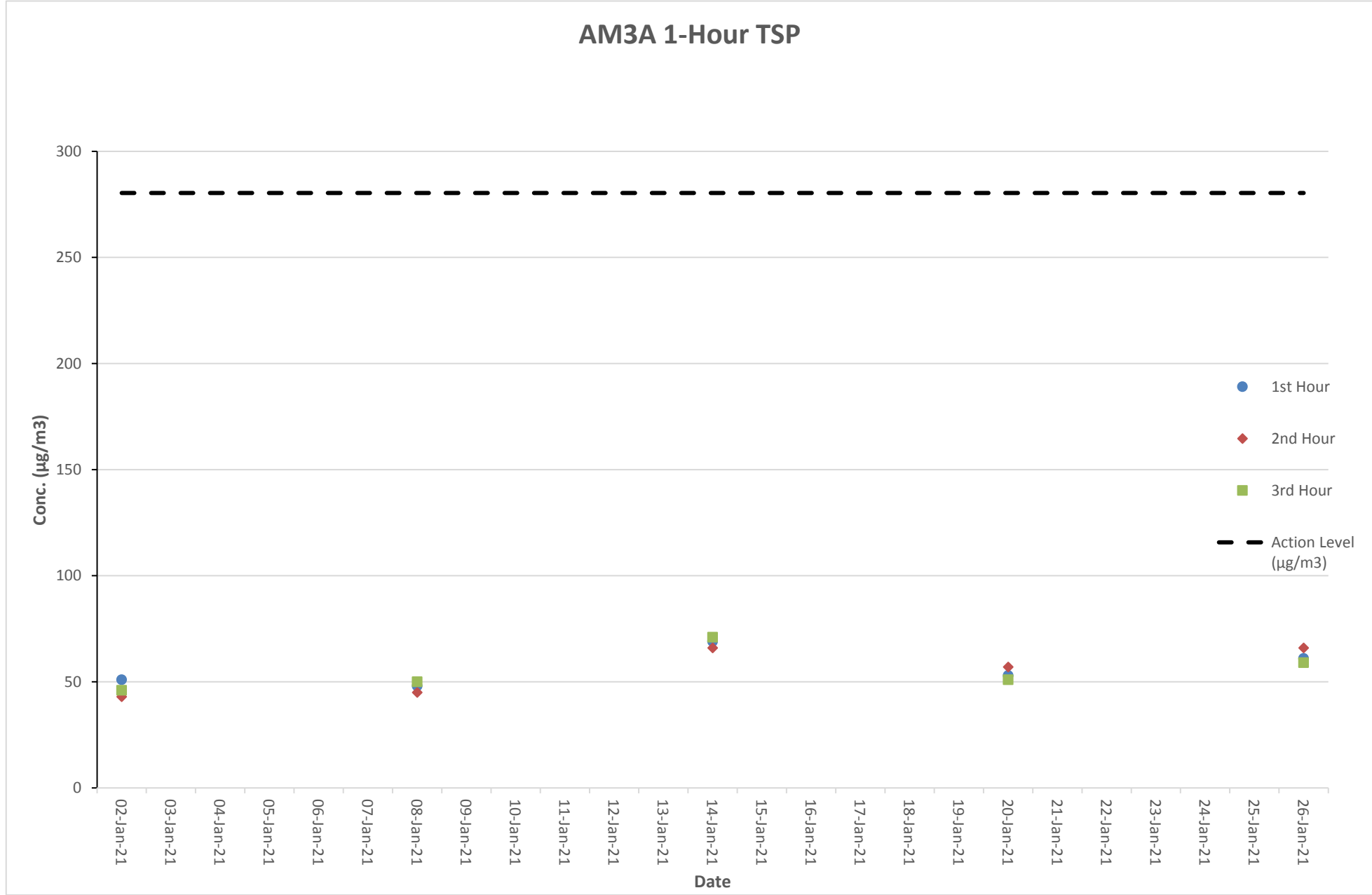
Graphical Presentation of Air Quality Monitoring Result at Station AM5A (24-hour TSP)



**Air Quality Monitoring Result at Station AM3A (1-hour TSP)**

| Date      | Weather Condition | Time  |        | Conc. (µg/m3) |          |          | Action Level | Limit Level |
|-----------|-------------------|-------|--------|---------------|----------|----------|--------------|-------------|
|           |                   | Start | Finish | 1st Hour      | 2nd Hour | 3rd Hour |              |             |
| 02-Jan-21 | Fine              | 8:31  | 11:31  | 51            | 43       | 46       | 280.4        | 500         |
| 08-Jan-21 | Cloudy            | 14:22 | 17:22  | 48            | 45       | 50       | 280.4        | 500         |
| 14-Jan-21 | Fine              | 8:27  | 11:27  | 69            | 66       | 71       | 280.4        | 500         |
| 20-Jan-21 | Fine              | 14:08 | 17:08  | 53            | 57       | 51       | 280.4        | 500         |
| 26-Jan-21 | Fine              | 8:20  | 11:20  | 61            | 66       | 59       | 280.4        | 500         |

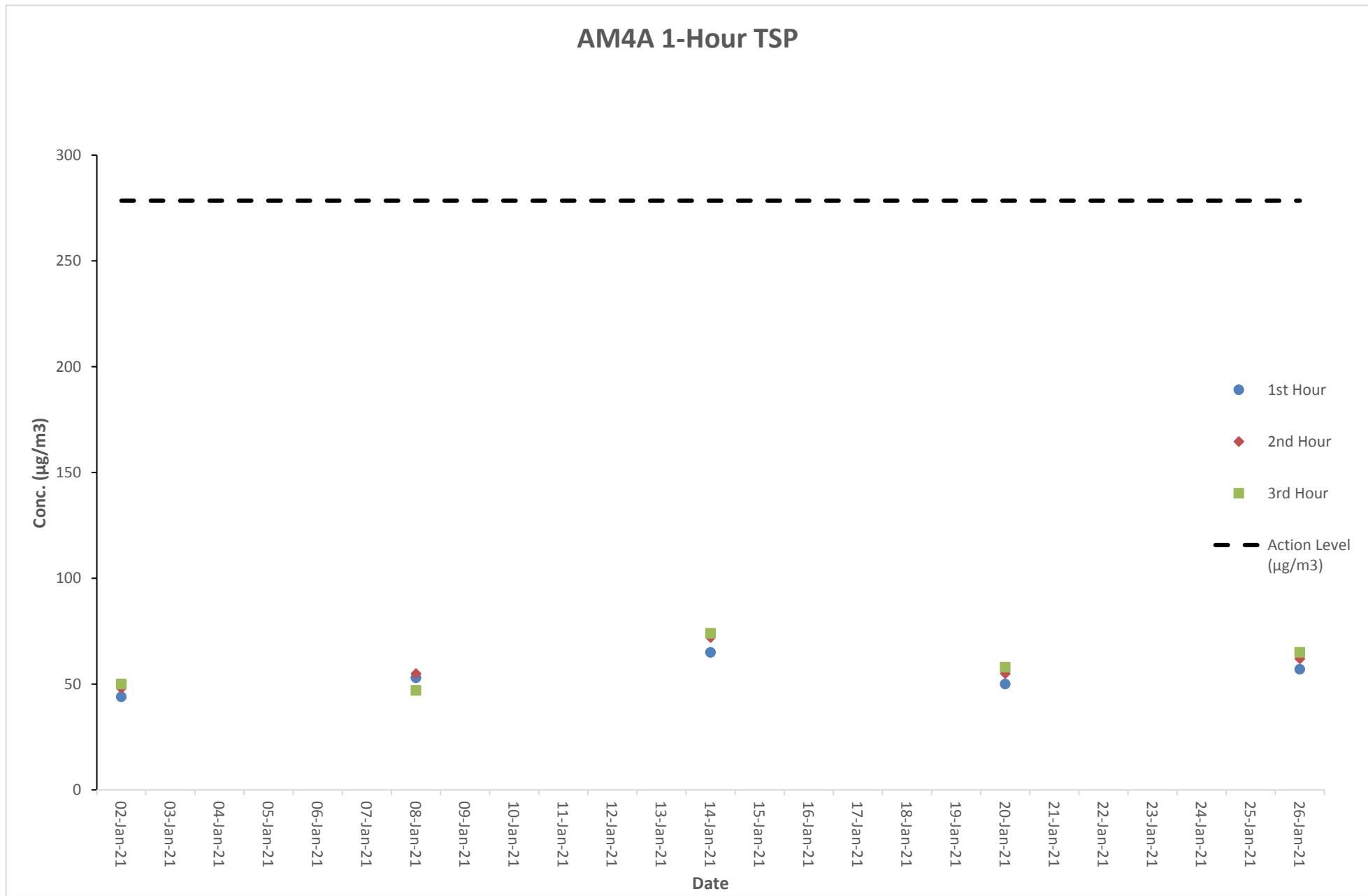
Graphical Presentation of Air Quality Monitoring Result at Station AM3A (1-hour TSP)



**Air Quality Monitoring Result at Station AM4A (1-hour TSP)**

| Date      | Weather Condition | Time  |        | Conc. (µg/m3) |          |          | Action Level | Limit Level |
|-----------|-------------------|-------|--------|---------------|----------|----------|--------------|-------------|
|           |                   | Start | Finish | 1st Hour      | 2nd Hour | 3rd Hour |              |             |
| 02-Jan-21 | Fine              | 8:39  | 11:39  | 44            | 48       | 50       | 278.5        | 500         |
| 08-Jan-21 | Cloudy            | 14:30 | 17:30  | 53            | 55       | 47       | 278.5        | 500         |
| 14-Jan-21 | Fine              | 8:35  | 11:35  | 65            | 72       | 74       | 278.5        | 500         |
| 20-Jan-21 | Fine              | 14:16 | 17:16  | 50            | 55       | 58       | 278.5        | 500         |
| 26-Jan-21 | Fine              | 8:28  | 11:28  | 57            | 62       | 65       | 278.5        | 500         |

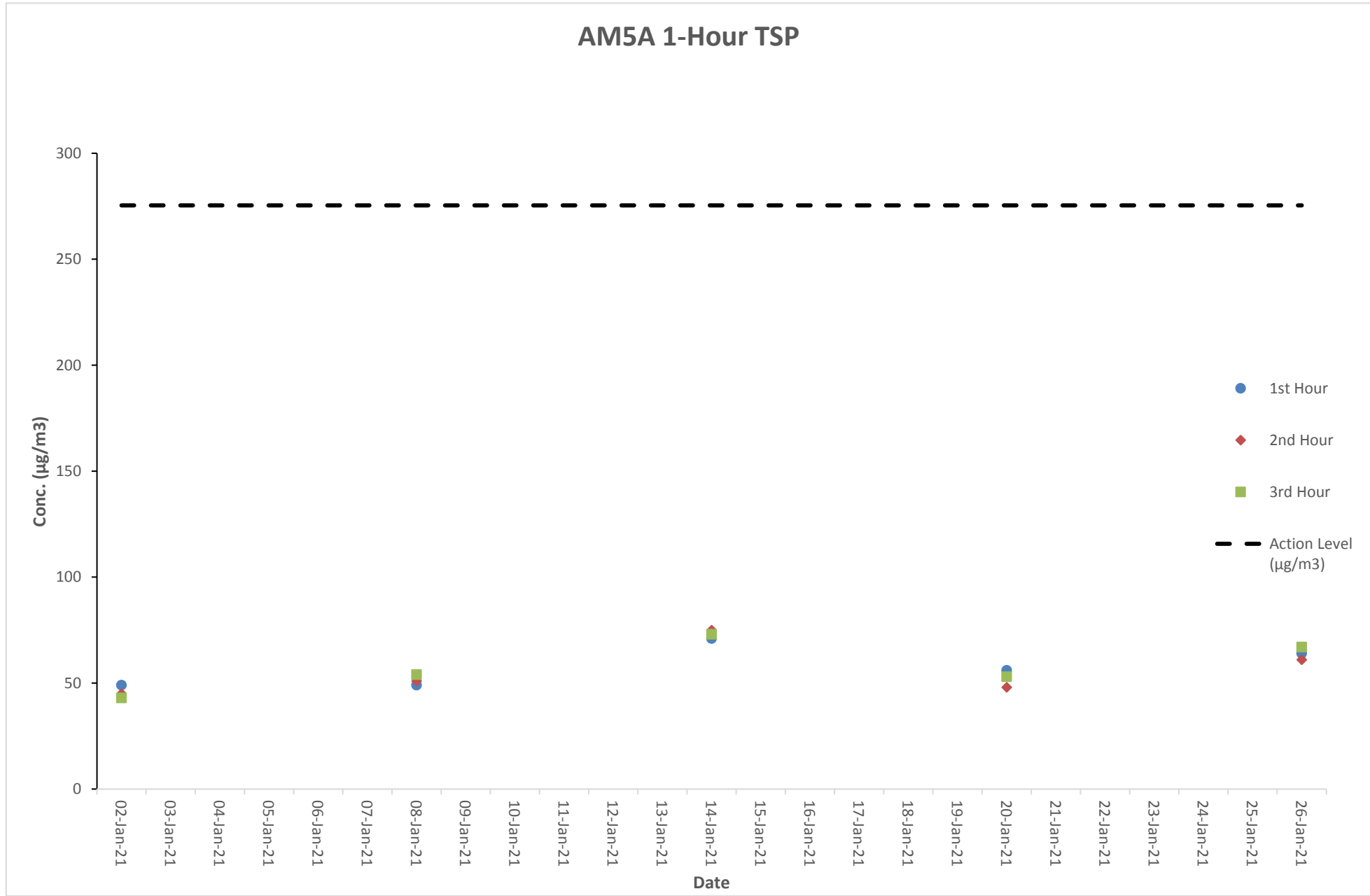
Graphical Presentation of Air Quality Monitoring Result at Station AM4A (1-hour TSP)



**Air Quality Monitoring Result at Station AM5A (1-hour TSP)**

| Date      | Weather Condition | Time  |        | Conc. ( $\mu\text{g}/\text{m}^3$ ) |          |          | Action Level | Limit Level |
|-----------|-------------------|-------|--------|------------------------------------|----------|----------|--------------|-------------|
|           |                   | Start | Finish | 1st Hour                           | 2nd Hour | 3rd Hour |              |             |
| 02-Jan-21 | Fine              | 8:54  | 11:54  | 49                                 | 45       | 43       | 275.4        | 500         |
| 08-Jan-21 | Cloudy            | 14:47 | 17:47  | 49                                 | 51       | 54       | 275.4        | 500         |
| 14-Jan-21 | Fine              | 8:50  | 11:50  | 71                                 | 75       | 73       | 275.4        | 500         |
| 20-Jan-21 | Fine              | 14:33 | 17:33  | 56                                 | 48       | 53       | 275.4        | 500         |
| 26-Jan-21 | Fine              | 8:43  | 11:43  | 64                                 | 61       | 67       | 275.4        | 500         |

Graphical Presentation of Air Quality Monitoring Result at Station AM5A (1-hour TSP)





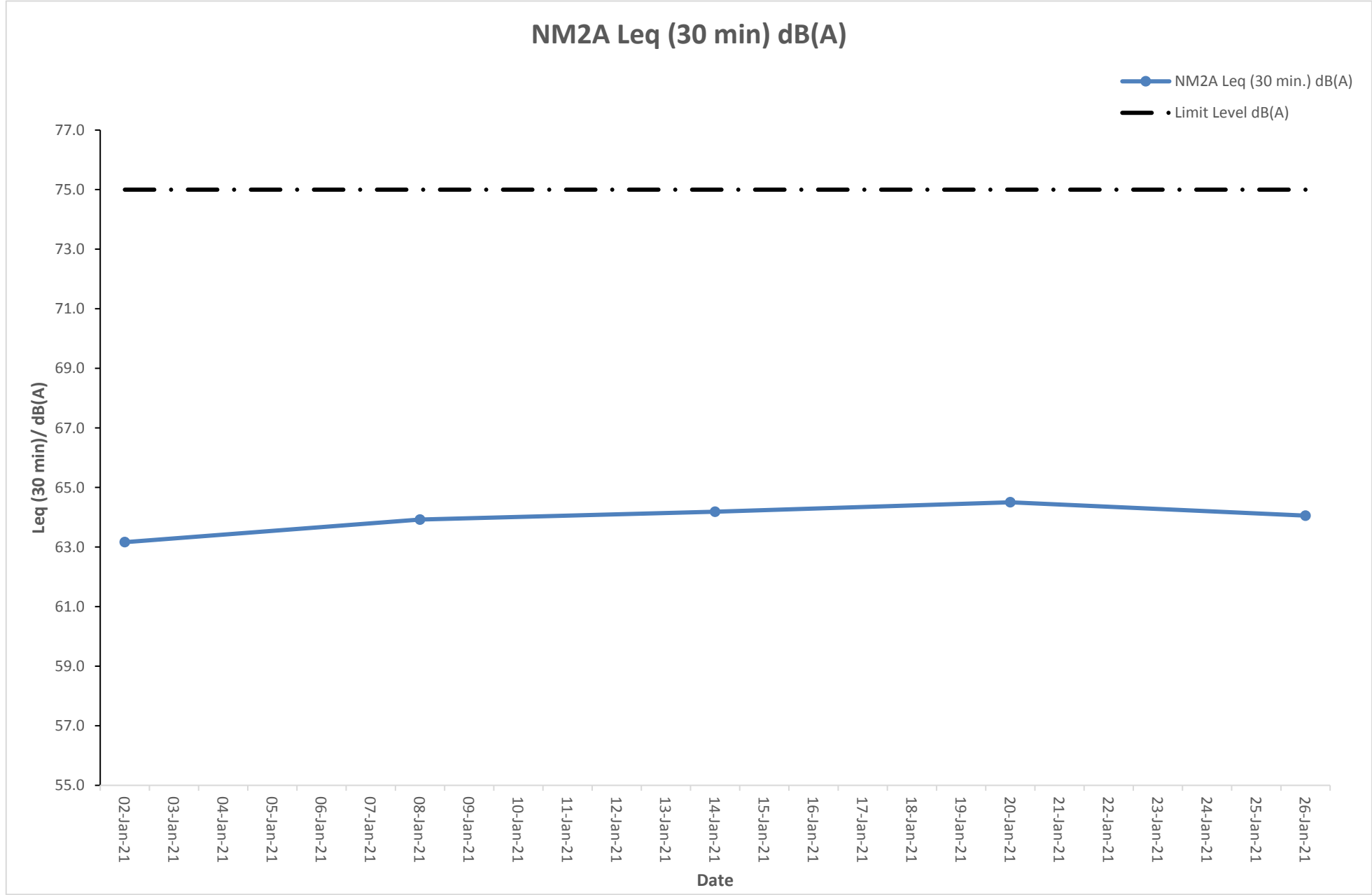
# Noise Monitoring Result at Station NM2A

| Date      | Time  | Measured L10 dB(A) | Measured L90 dB(A) | Leq (30 min.) dB(A) |
|-----------|-------|--------------------|--------------------|---------------------|
| 02-Jan-21 | 8:31  | 63.4               | 58.3               | 63.2                |
| 02-Jan-21 | 8:36  | 64.9               | 57.6               |                     |
| 02-Jan-21 | 8:41  | 65.5               | 60.2               |                     |
| 02-Jan-21 | 8:46  | 66.1               | 59.4               |                     |
| 02-Jan-21 | 8:51  | 64.4               | 58.1               |                     |
| 02-Jan-21 | 8:56  | 64.7               | 58.8               |                     |
| 08-Jan-21 | 14:22 | 65.5               | 57.1               | 63.9                |
| 08-Jan-21 | 14:27 | 66.4               | 58.5               |                     |
| 08-Jan-21 | 14:32 | 66.2               | 58.8               |                     |
| 08-Jan-21 | 14:37 | 64.6               | 60.3               |                     |
| 08-Jan-21 | 14:42 | 65.3               | 60.1               |                     |
| 08-Jan-21 | 14:47 | 65.9               | 59.6               |                     |
| 14-Jan-21 | 8:27  | 65.8               | 60.3               | 64.2                |
| 14-Jan-21 | 8:32  | 66.1               | 59.6               |                     |
| 14-Jan-21 | 8:37  | 65.3               | 59.1               |                     |
| 14-Jan-21 | 8:42  | 65.2               | 58.2               |                     |
| 14-Jan-21 | 8:47  | 64.7               | 58.8               |                     |
| 14-Jan-21 | 8:52  | 65.5               | 59.4               |                     |
| 20-Jan-21 | 14:08 | 66.7               | 59.3               | 64.5                |
| 20-Jan-21 | 14:13 | 66.1               | 58.4               |                     |
| 20-Jan-21 | 14:18 | 65.4               | 58.9               |                     |
| 20-Jan-21 | 14:23 | 67.3               | 60.2               |                     |
| 20-Jan-21 | 14:28 | 66.5               | 59.5               |                     |
| 20-Jan-21 | 14:33 | 64.8               | 59.1               |                     |
| 26-Jan-21 | 8:20  | 65.1               | 58.4               | 64.1                |
| 26-Jan-21 | 8:25  | 64.3               | 59.1               |                     |
| 26-Jan-21 | 8:30  | 64.8               | 59.9               |                     |
| 26-Jan-21 | 8:35  | 65.6               | 59.5               |                     |
| 26-Jan-21 | 8:40  | 66.7               | 60.7               |                     |
| 26-Jan-21 | 8:45  | 66.2               | 58.8               |                     |



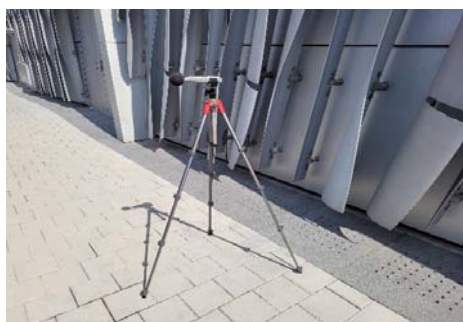
The station set-up of a façade measurement at station NM2A.

Graphical Presentation of Noise Monitoring Result at Station NM2A



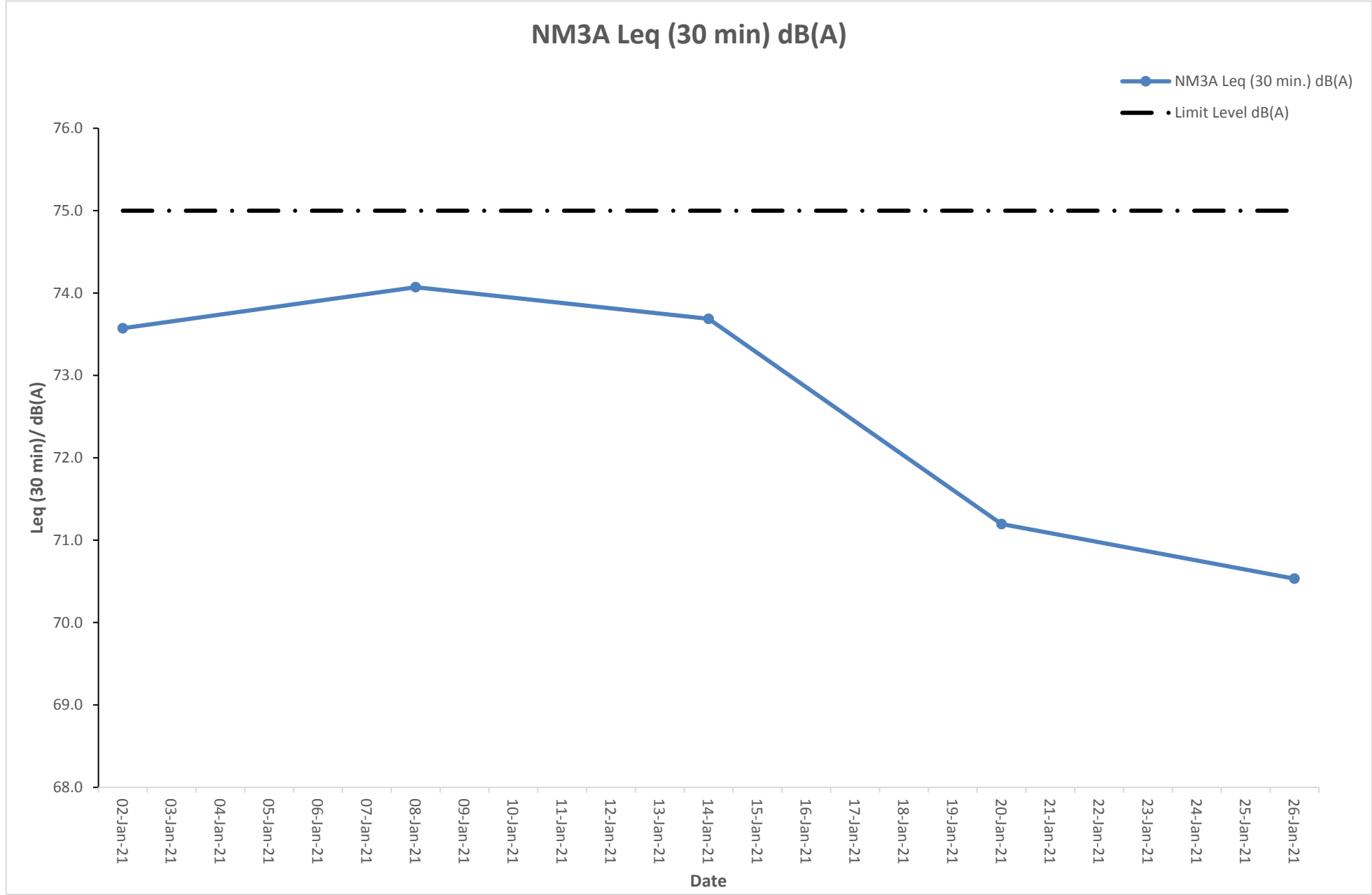
# **Noise Monitoring Result at Station NM3A**

| Date      | Time  | Measured L10 dB(A) | Measured L90 dB(A) | Leq (30 min.) dB(A) |
|-----------|-------|--------------------|--------------------|---------------------|
| 02-Jan-21 | 10:01 | 75.1               | 67.8               | 73.6                |
| 02-Jan-21 | 10:06 | 74.6               | 69.5               |                     |
| 02-Jan-21 | 10:11 | 75.5               | 70.1               |                     |
| 02-Jan-21 | 10:16 | 76.3               | 69.3               |                     |
| 02-Jan-21 | 10:21 | 74.8               | 68.4               |                     |
| 02-Jan-21 | 10:26 | 75.6               | 67.7               |                     |
| 08-Jan-21 | 15:55 | 76.4               | 68.3               | 74.1                |
| 08-Jan-21 | 16:00 | 76.7               | 67.7               |                     |
| 08-Jan-21 | 16:05 | 75.9               | 69.1               |                     |
| 08-Jan-21 | 16:10 | 74.8               | 69.8               |                     |
| 08-Jan-21 | 16:15 | 75.1               | 70.2               |                     |
| 08-Jan-21 | 16:20 | 76.2               | 69.4               |                     |
| 14-Jan-21 | 9:57  | 75.8               | 68.5               | 73.7                |
| 14-Jan-21 | 10:02 | 75.1               | 67.1               |                     |
| 14-Jan-21 | 10:07 | 74.3               | 67.7               |                     |
| 14-Jan-21 | 10:12 | 73.7               | 68.2               |                     |
| 14-Jan-21 | 10:17 | 74.6               | 69.4               |                     |
| 14-Jan-21 | 10:22 | 75.3               | 68.7               |                     |
| 20-Jan-21 | 15:41 | 72.1               | 65.5               | 71.2                |
| 20-Jan-21 | 15:46 | 72.3               | 64.3               |                     |
| 20-Jan-21 | 15:51 | 73.3               | 66.3               |                     |
| 20-Jan-21 | 15:56 | 72.1               | 65.4               |                     |
| 20-Jan-21 | 16:01 | 73.4               | 68.5               |                     |
| 20-Jan-21 | 16:06 | 73.1               | 68.4               |                     |
| 26-Jan-21 | 9:50  | 72.2               | 65.1               | 70.5                |
| 26-Jan-21 | 9:55  | 71.3               | 65.3               |                     |
| 26-Jan-21 | 10:00 | 72.6               | 64.5               |                     |
| 26-Jan-21 | 10:05 | 72.4               | 65.2               |                     |
| 26-Jan-21 | 10:10 | 72.9               | 65.4               |                     |
| 26-Jan-21 | 10:15 | 73.3               | 68.2               |                     |



The station set-up of a façade measurement at station NM3A.

Graphical Presentation of Noise Monitoring Result at Station NM3A



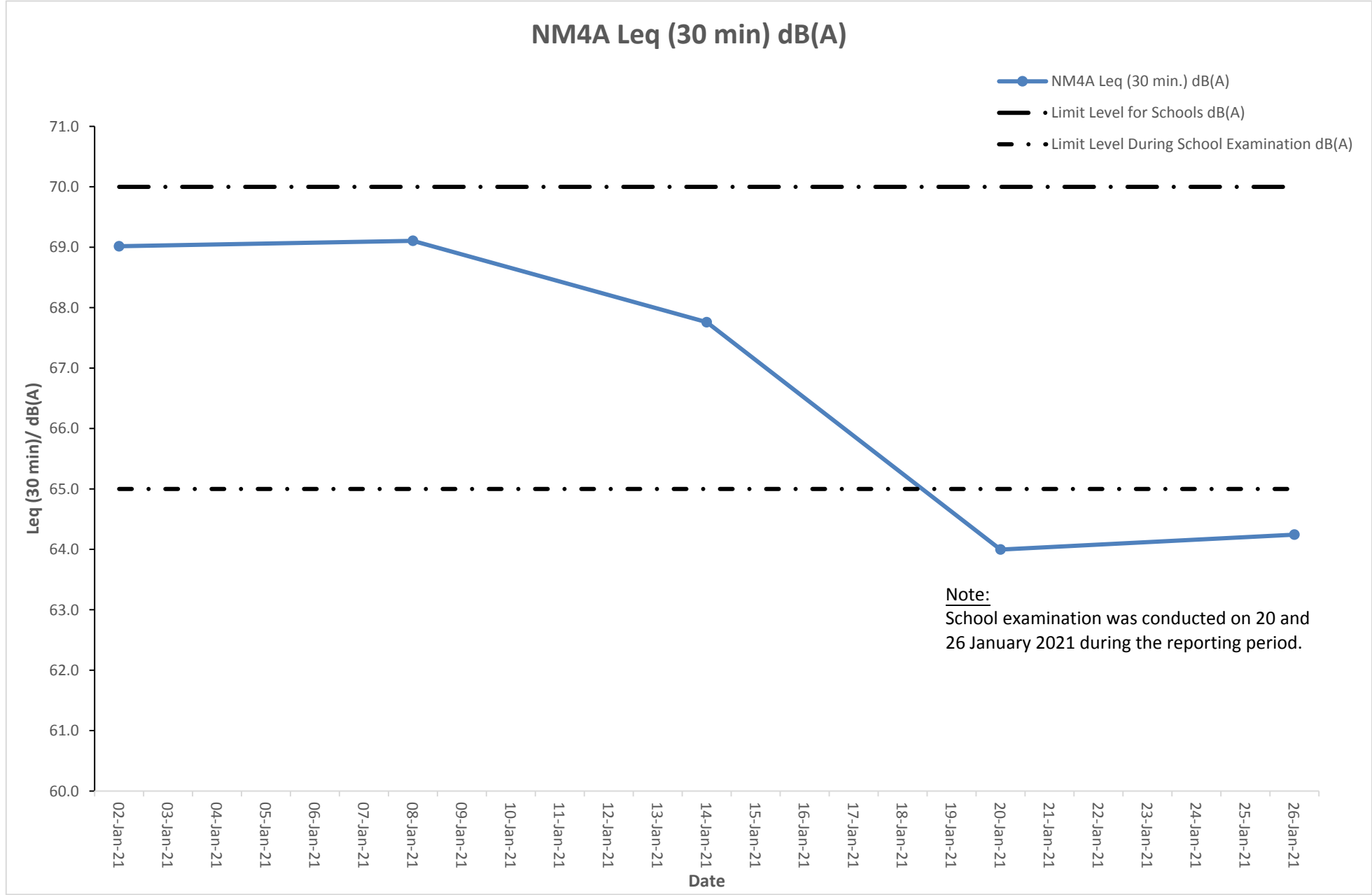
# **Noise Monitoring Result at Station NM4A**

| Date      | Time  | Measured L10 dB(A) | Measured L90 dB(A) | Leq (30 min.) dB(A) |
|-----------|-------|--------------------|--------------------|---------------------|
| 02-Jan-21 | 10:36 | 71.6               | 67.5               | 69.0                |
| 02-Jan-21 | 10:41 | 68.6               | 65.2               |                     |
| 02-Jan-21 | 10:46 | 70.3               | 66.2               |                     |
| 02-Jan-21 | 10:51 | 71.1               | 67.5               |                     |
| 02-Jan-21 | 10:56 | 70.5               | 66.5               |                     |
| 02-Jan-21 | 11:01 | 71.1               | 67.5               |                     |
| 08-Jan-21 | 16:30 | 71.3               | 67.5               | 69.1                |
| 08-Jan-21 | 16:35 | 71.2               | 67.3               |                     |
| 08-Jan-21 | 16:40 | 71.5               | 67.4               |                     |
| 08-Jan-21 | 16:45 | 71.1               | 67.5               |                     |
| 08-Jan-21 | 16:50 | 71.6               | 67.3               |                     |
| 08-Jan-21 | 16:55 | 68.3               | 65.4               |                     |
| 14-Jan-21 | 10:32 | 67.5               | 63.2               | 67.8                |
| 14-Jan-21 | 10:37 | 70.3               | 66.2               |                     |
| 14-Jan-21 | 10:42 | 68.1               | 65.5               |                     |
| 14-Jan-21 | 10:47 | 70.3               | 66.2               |                     |
| 14-Jan-21 | 10:52 | 68.6               | 65.9               |                     |
| 14-Jan-21 | 10:57 | 70.2               | 66.3               |                     |
| 20-Jan-21 | 16:16 | 66.5               | 61.5               | 64.0                |
| 20-Jan-21 | 16:21 | 66.5               | 61.4               |                     |
| 20-Jan-21 | 16:26 | 65.4               | 58.5               |                     |
| 20-Jan-21 | 16:31 | 65.3               | 58.1               |                     |
| 20-Jan-21 | 16:36 | 66.9               | 61.3               |                     |
| 20-Jan-21 | 16:41 | 66.4               | 61.2               |                     |
| 26-Jan-21 | 10:25 | 66.5               | 61.8               | 64.2                |
| 26-Jan-21 | 10:30 | 65.3               | 60.2               |                     |
| 26-Jan-21 | 10:35 | 66.3               | 61.4               |                     |
| 26-Jan-21 | 10:40 | 66.3               | 61.3               |                     |
| 26-Jan-21 | 10:45 | 66.1               | 61.2               |                     |
| 26-Jan-21 | 10:50 | 65.3               | 60.4               |                     |



The station set-up of a façade measurement at station NM4A.

Graphical Presentation of Noise Monitoring Result at Station NM4A

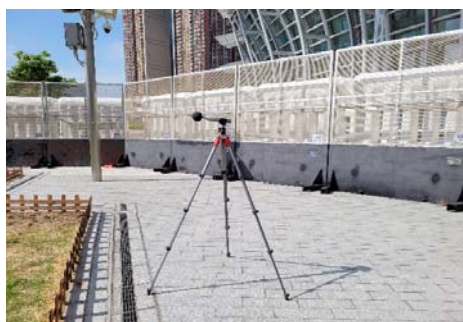


# Noise Monitoring Result at Station NM5A

| Date      | Time  | Measured L10 dB(A) | Measured L90 dB(A) | Leq (30 min.) dB(A) | Leq (30 min.) +3 dB(A) |
|-----------|-------|--------------------|--------------------|---------------------|------------------------|
| 02-Jan-21 | 9:21  | 64.3               | 54.9               | 62.2                | 65.2                   |
| 02-Jan-21 | 9:26  | 65.1               | 55.6               |                     |                        |
| 02-Jan-21 | 9:31  | 64.8               | 57.1               |                     |                        |
| 02-Jan-21 | 9:36  | 63.3               | 56.4               |                     |                        |
| 02-Jan-21 | 9:41  | 63.7               | 56.9               |                     |                        |
| 02-Jan-21 | 9:46  | 64.4               | 57.7               |                     |                        |
| 08-Jan-21 | 15:14 | 63.8               | 56.1               | 61.6                | 64.6                   |
| 08-Jan-21 | 15:19 | 63.5               | 54.4               |                     |                        |
| 08-Jan-21 | 15:24 | 62.7               | 55.5               |                     |                        |
| 08-Jan-21 | 15:29 | 64.1               | 55.2               |                     |                        |
| 08-Jan-21 | 15:34 | 63.3               | 56.6               |                     |                        |
| 08-Jan-21 | 15:39 | 62.9               | 56.3               |                     |                        |
| 14-Jan-21 | 9:17  | 65.5               | 55.5               | 62.7                | 65.7                   |
| 14-Jan-21 | 9:22  | 64.8               | 55.8               |                     |                        |
| 14-Jan-21 | 9:27  | 64.3               | 57.1               |                     |                        |
| 14-Jan-21 | 9:32  | 64.9               | 56.3               |                     |                        |
| 14-Jan-21 | 9:37  | 63.7               | 54.9               |                     |                        |
| 14-Jan-21 | 9:42  | 65.2               | 54.4               |                     |                        |
| 20-Jan-21 | 15:00 | 64.7               | 54.2               | 62.0                | 65.0                   |
| 20-Jan-21 | 15:05 | 65.1               | 55.5               |                     |                        |
| 20-Jan-21 | 15:10 | 63.6               | 55.8               |                     |                        |
| 20-Jan-21 | 15:15 | 64.5               | 54.9               |                     |                        |
| 20-Jan-21 | 15:20 | 64.2               | 53.8               |                     |                        |
| 20-Jan-21 | 15:25 | 63.3               | 54.5               |                     |                        |
| 26-Jan-21 | 9:10  | 62.8               | 55.8               | 61.5                | 64.5                   |
| 26-Jan-21 | 9:15  | 63.5               | 55.1               |                     |                        |
| 26-Jan-21 | 9:20  | 64.3               | 56.3               |                     |                        |
| 26-Jan-21 | 9:25  | 63.1               | 54.4               |                     |                        |
| 26-Jan-21 | 9:30  | 63.4               | 53.8               |                     |                        |
| 26-Jan-21 | 9:35  | 64.6               | 55.5               |                     |                        |

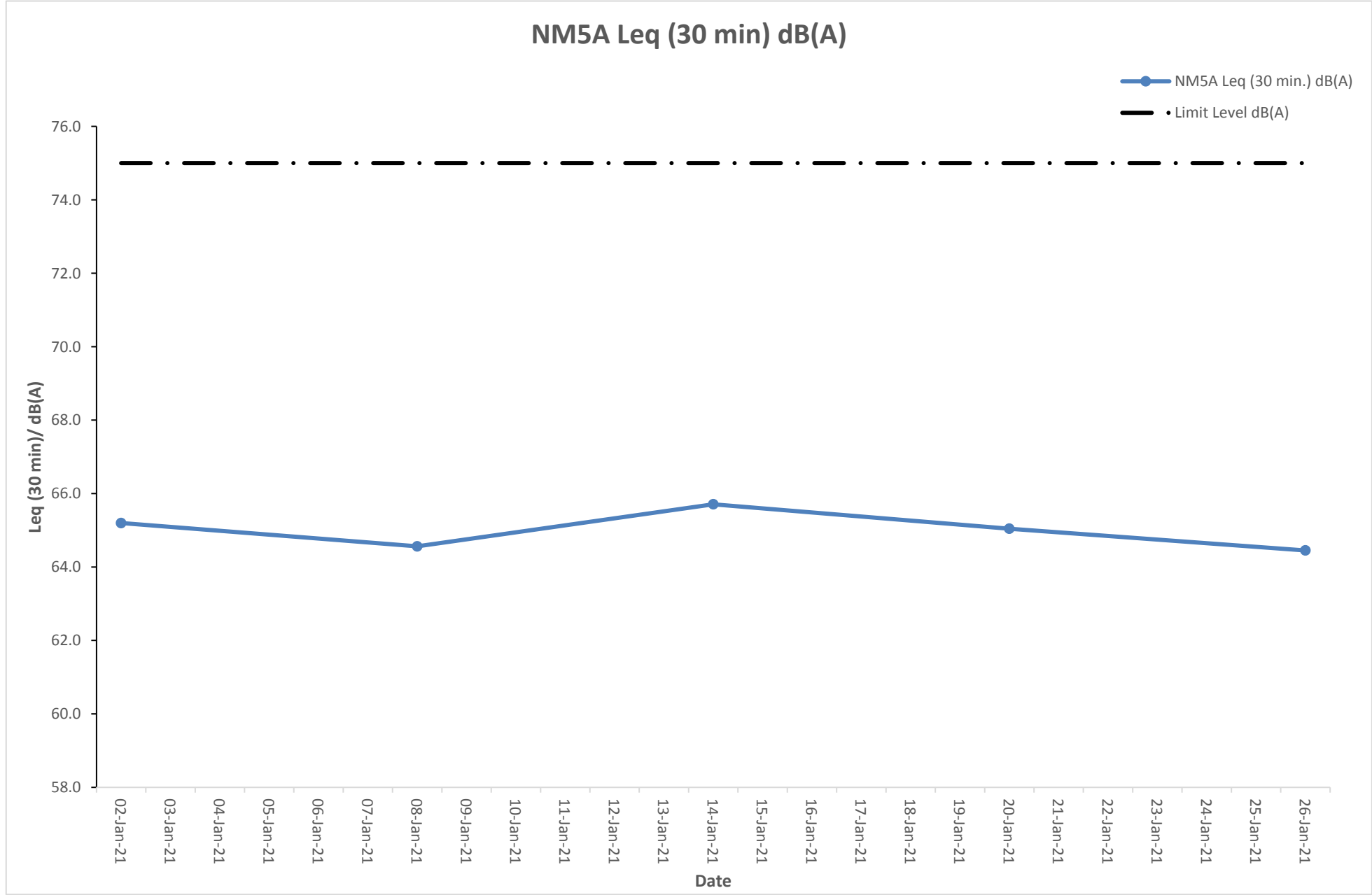
## Remarks:

+3dB(A) correction was applied to free-field measurement.



The station set-up of a free-field measurement at station NM5A.

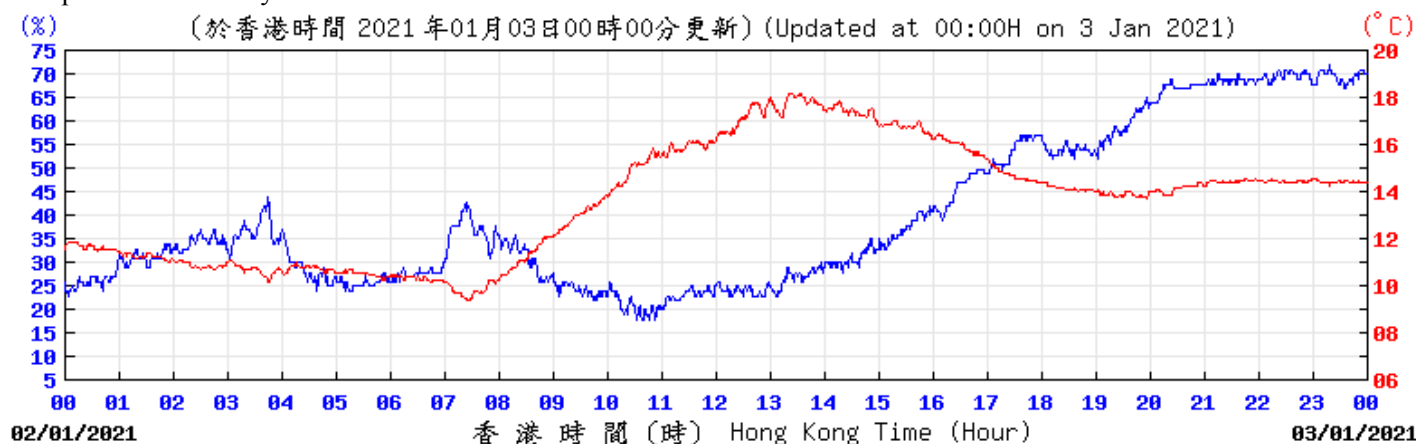
Graphical Presentation of Noise Monitoring Result at Station NM5A





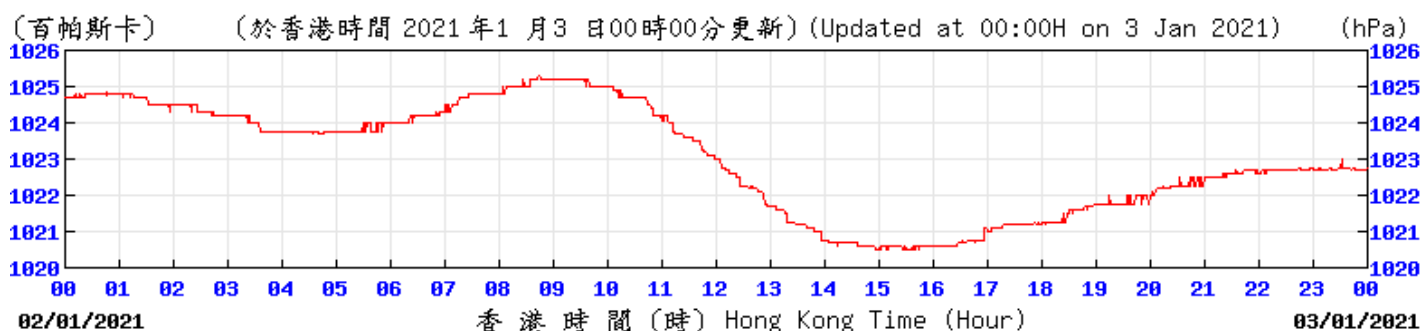
## **H. Meteorological Data Extracted from Hong Kong Observatory**

# Temperature/Humidity:



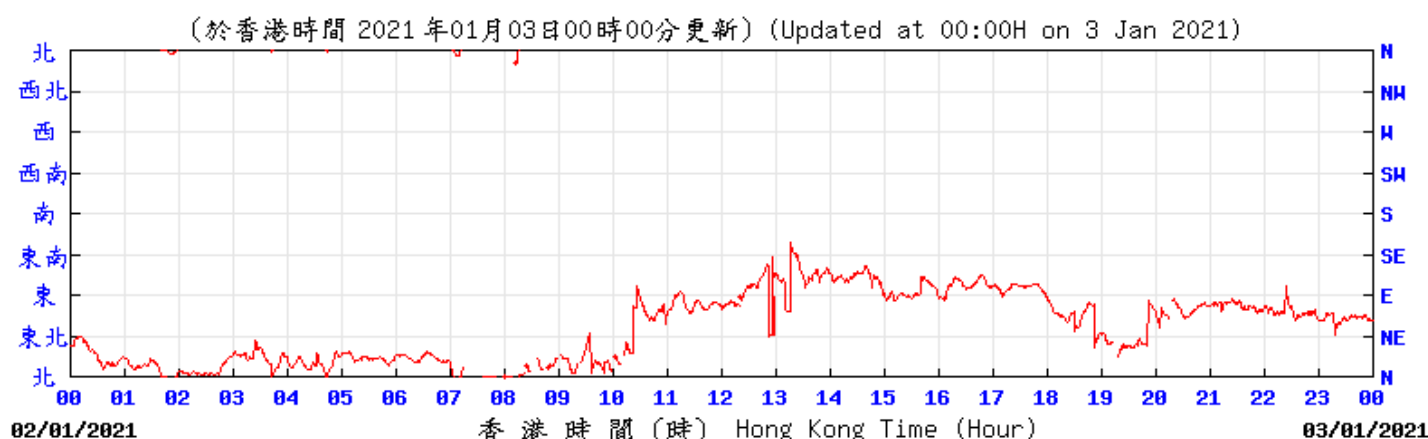
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## Pressure:



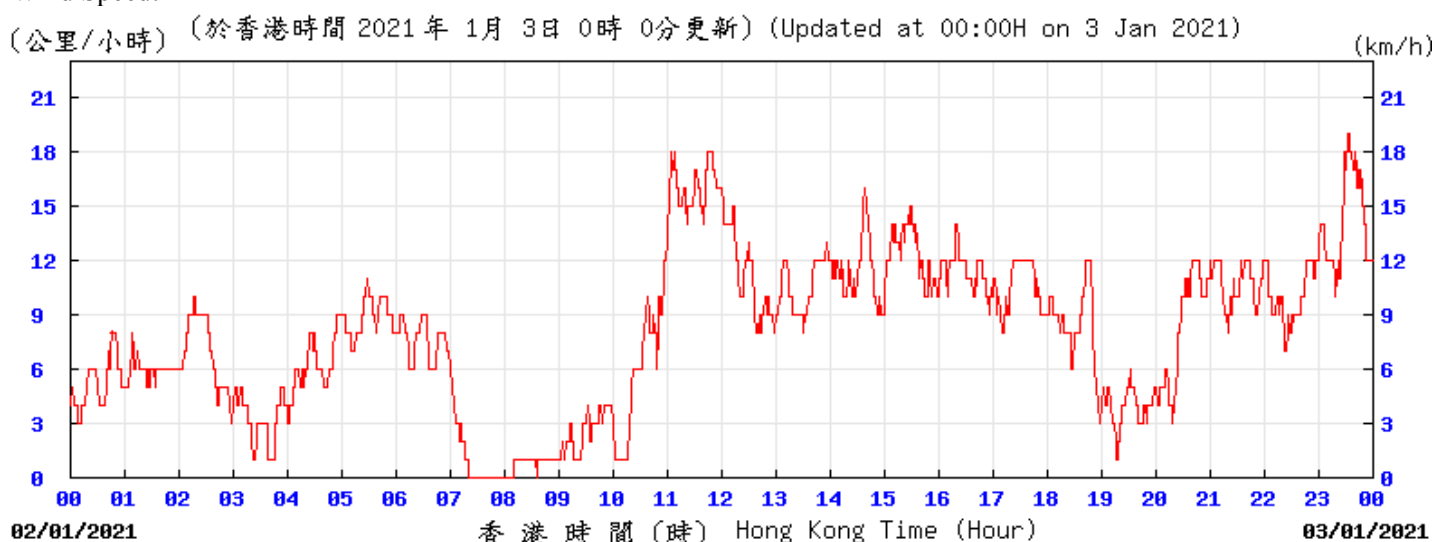
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## Wind Direction:



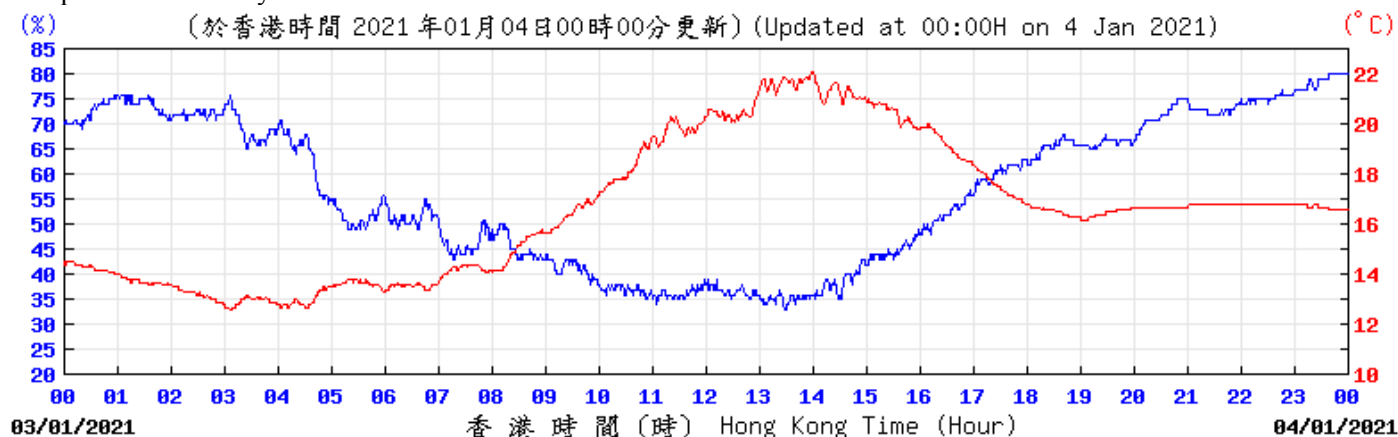
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## Wind Speed:

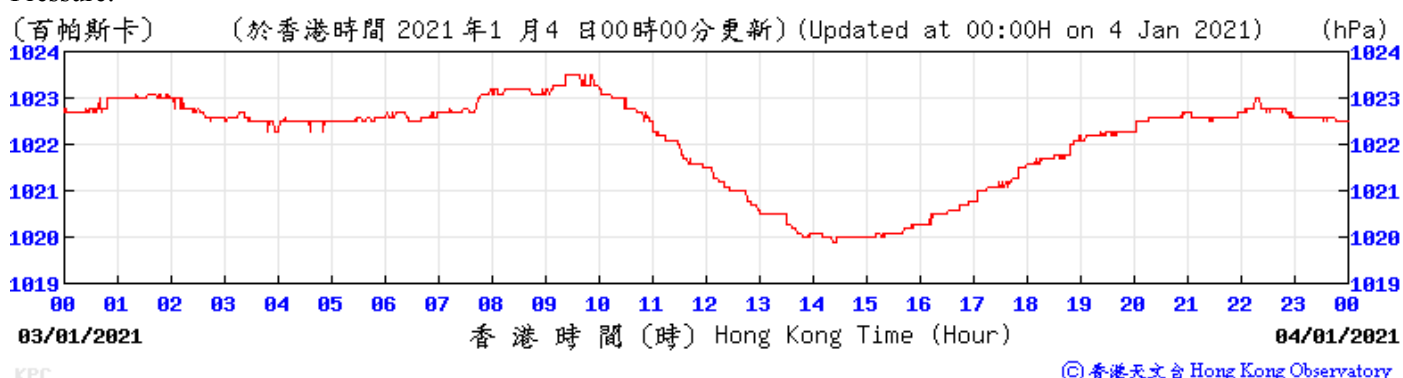


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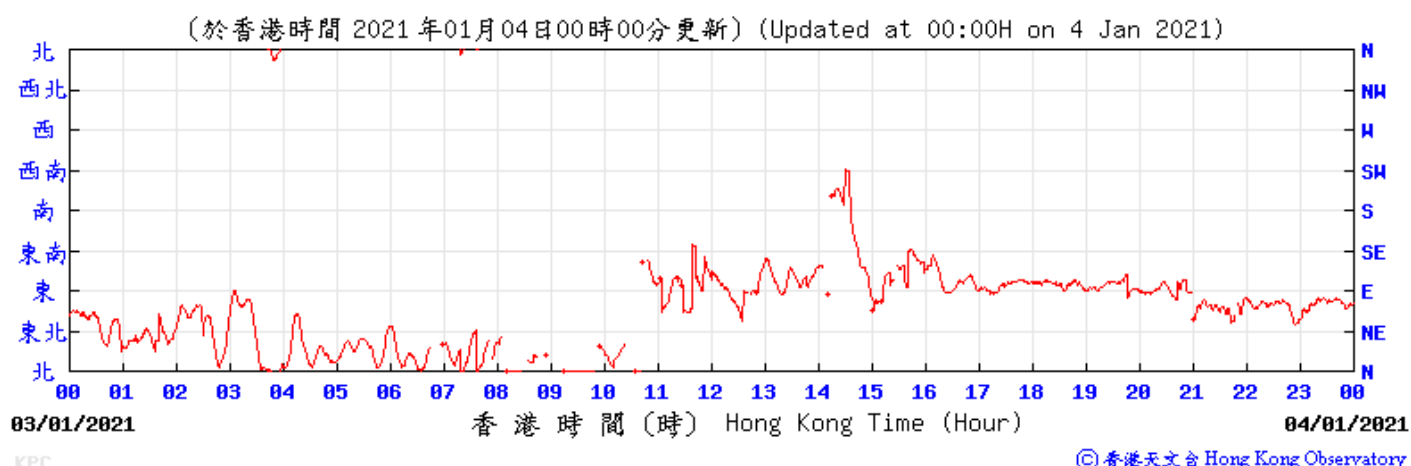
Temperature/Humidity:



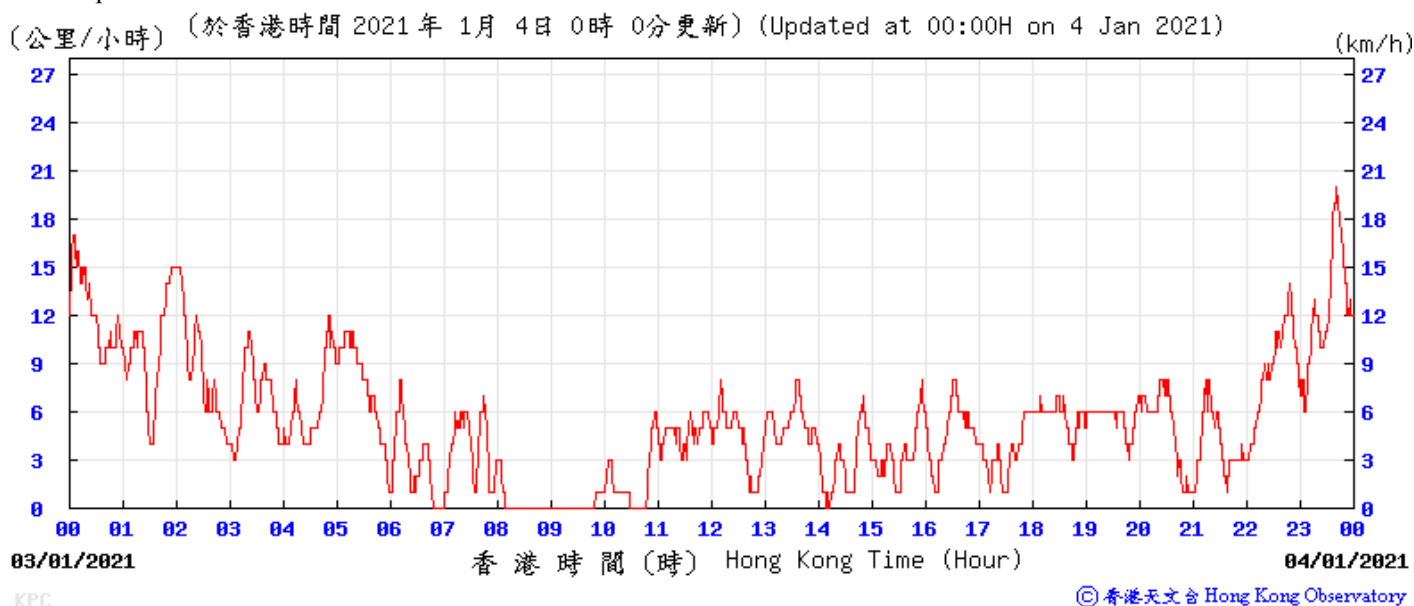
KPC  
Pressure:



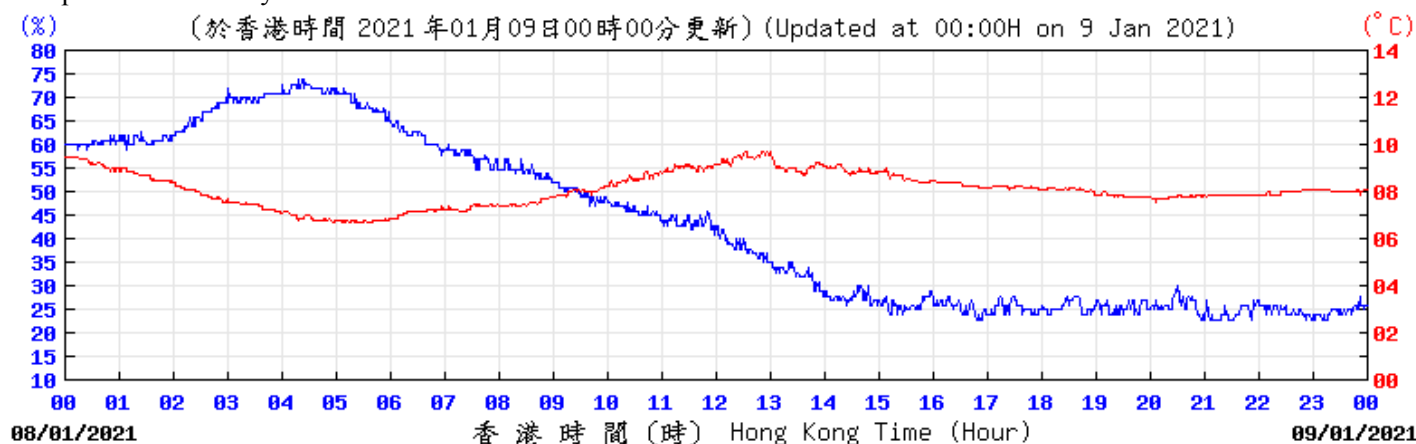
Wind Direction:



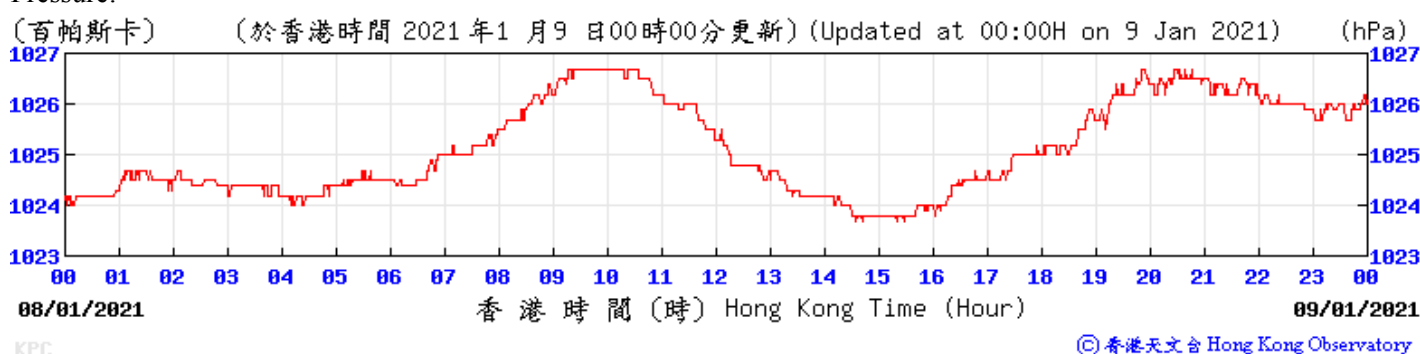
KPC  
Wind Speed:



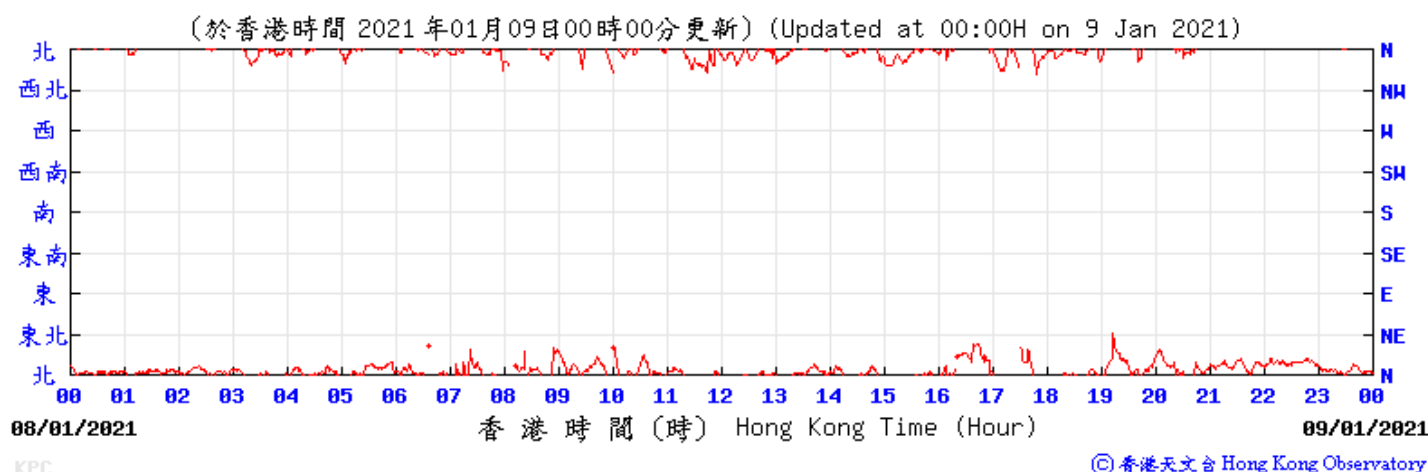
# Temperature/Humidity:



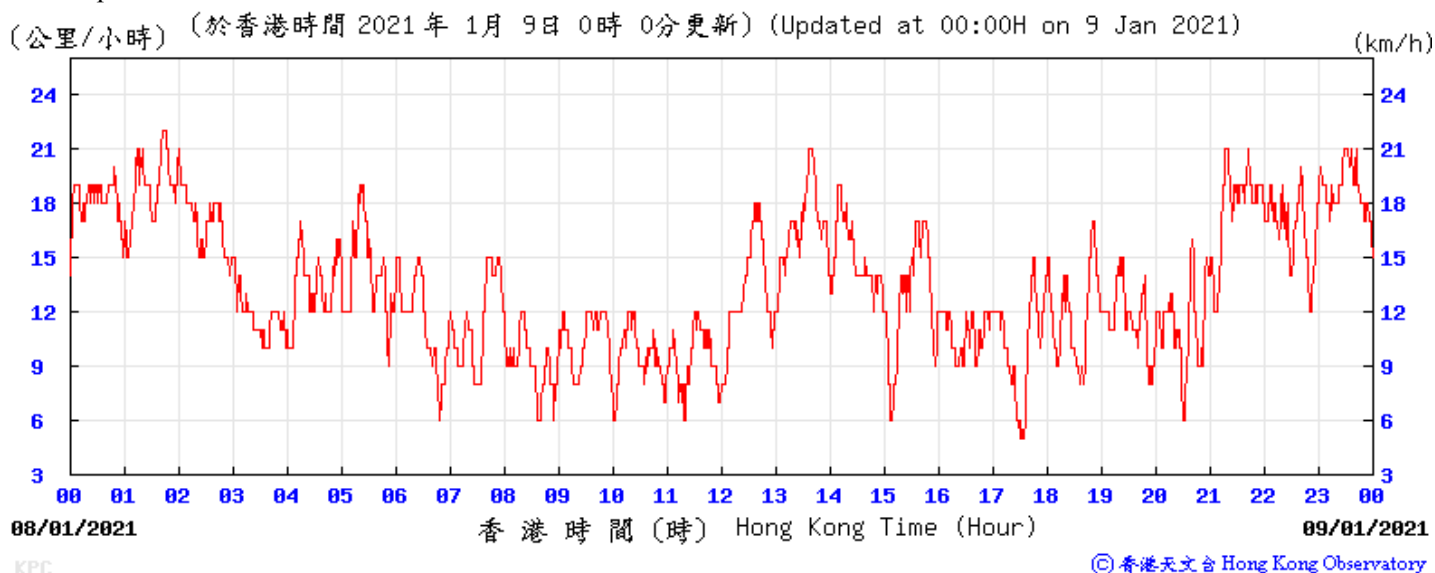
## Pressure:



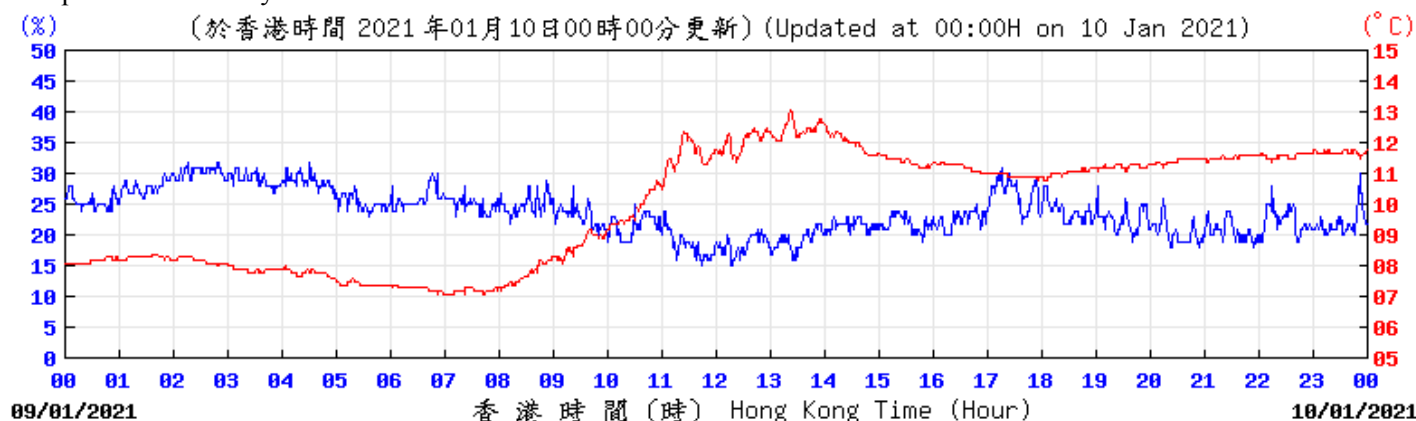
## Wind Direction:



## Wind Speed:

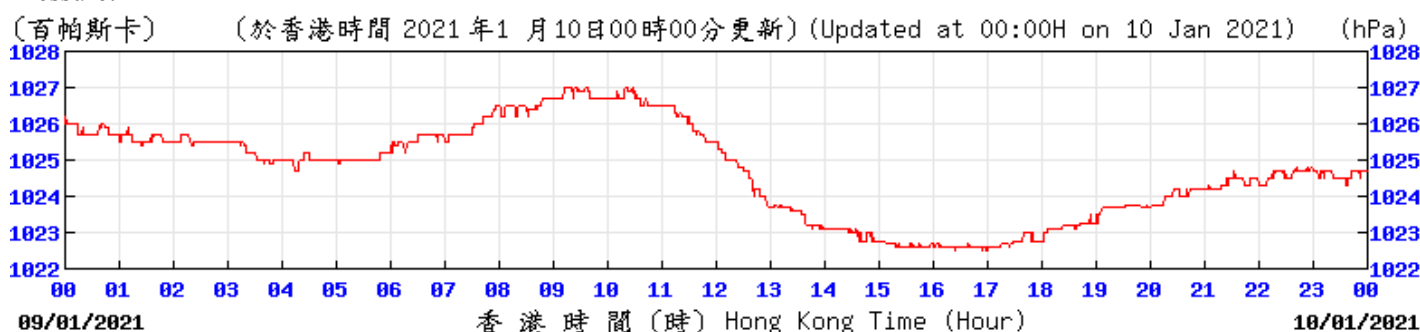


# Temperature/Humidity:



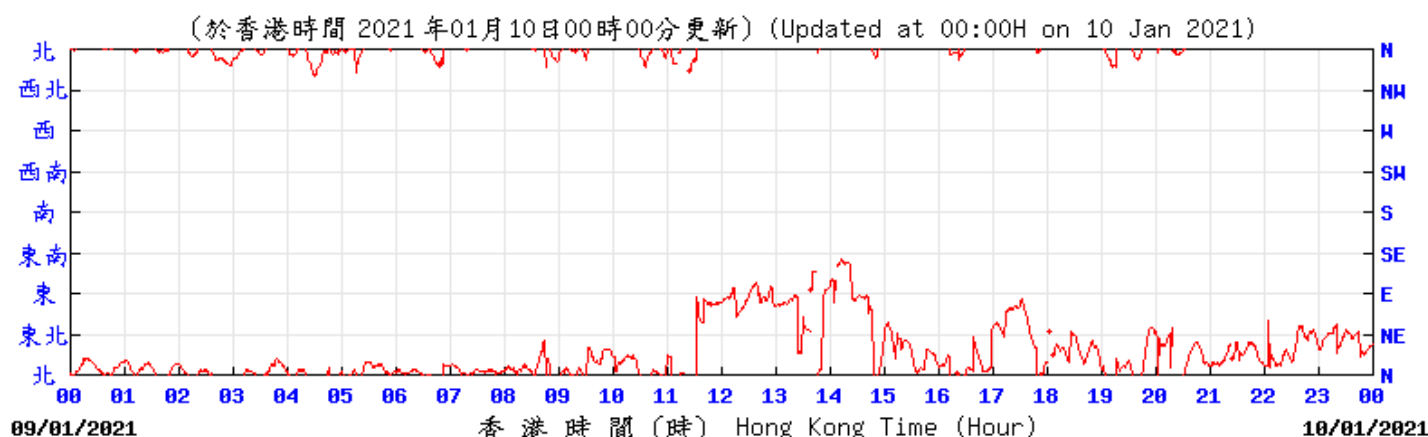
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## Pressure:



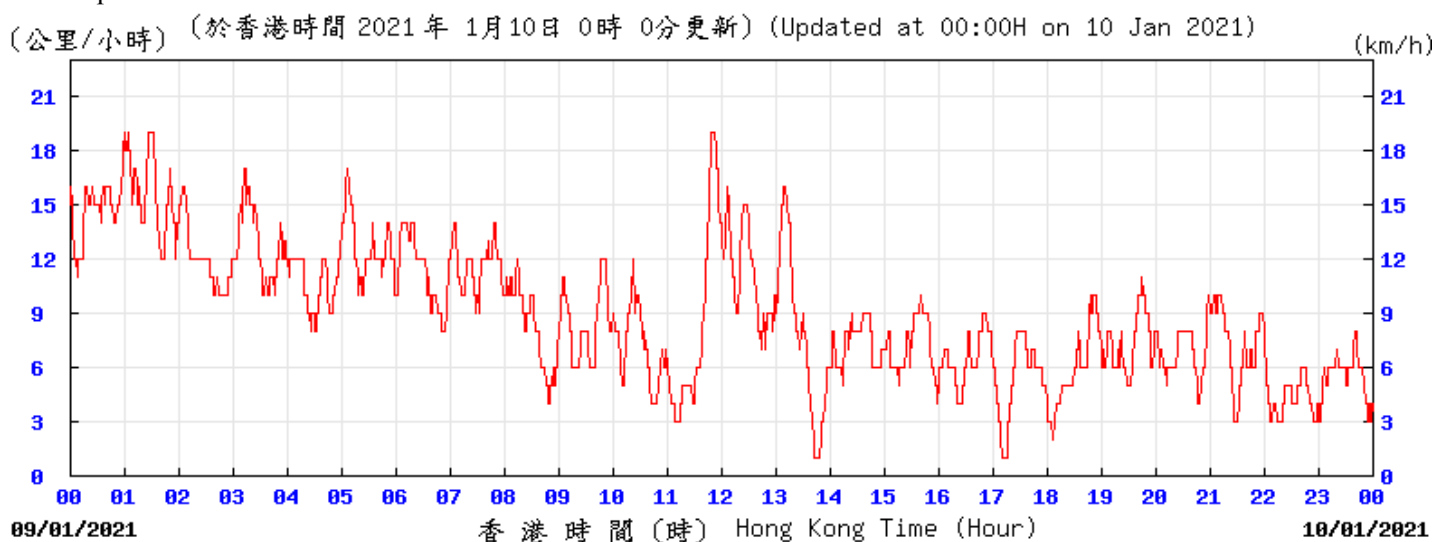
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## Wind Direction:



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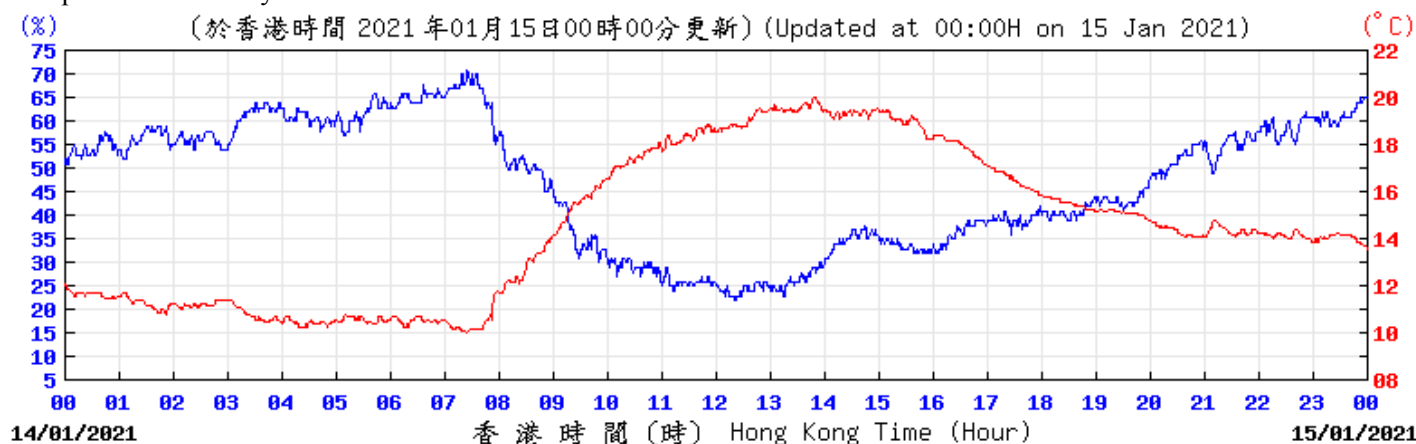
## Wind Speed:



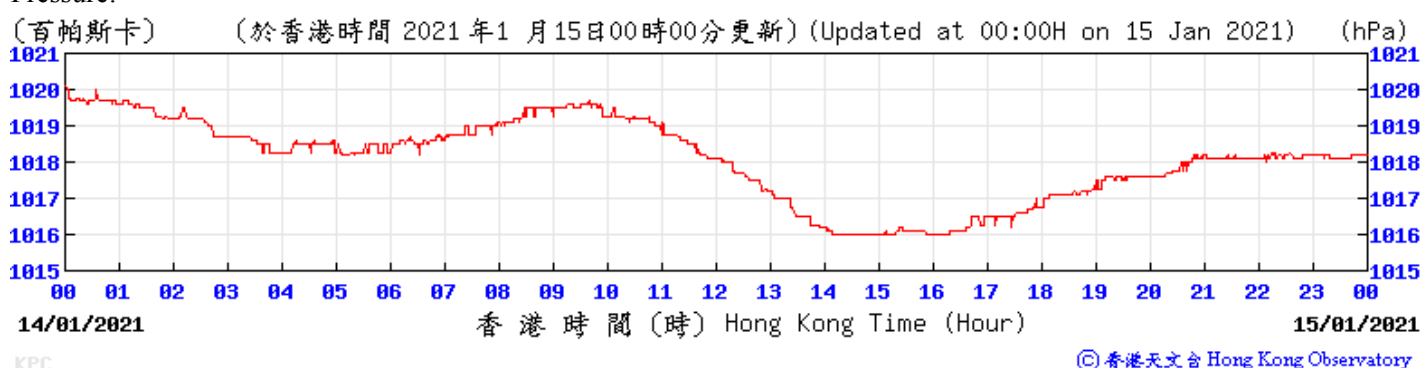
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KPC

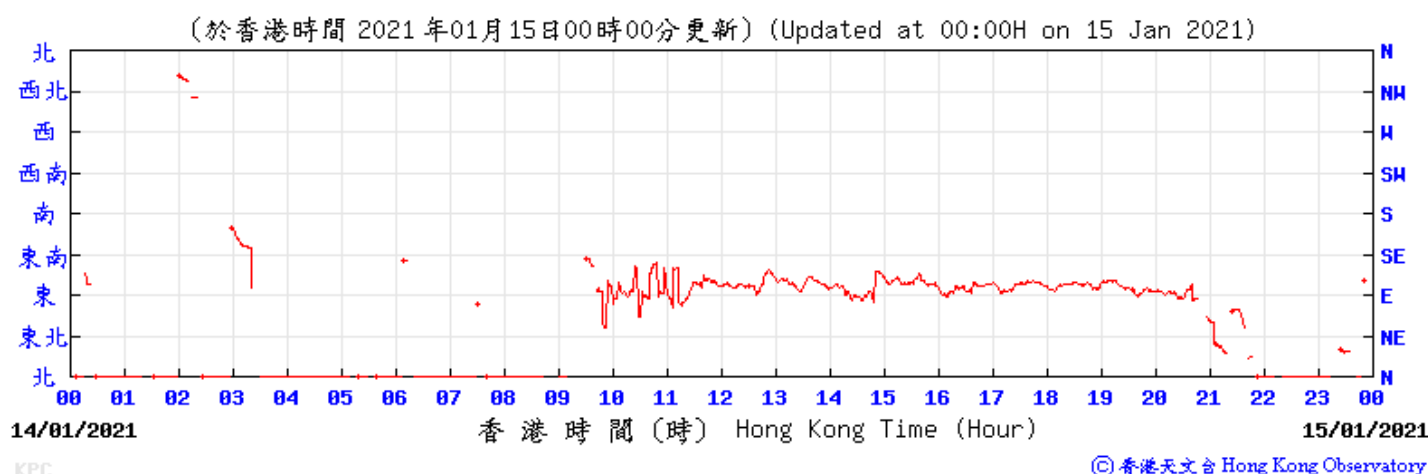
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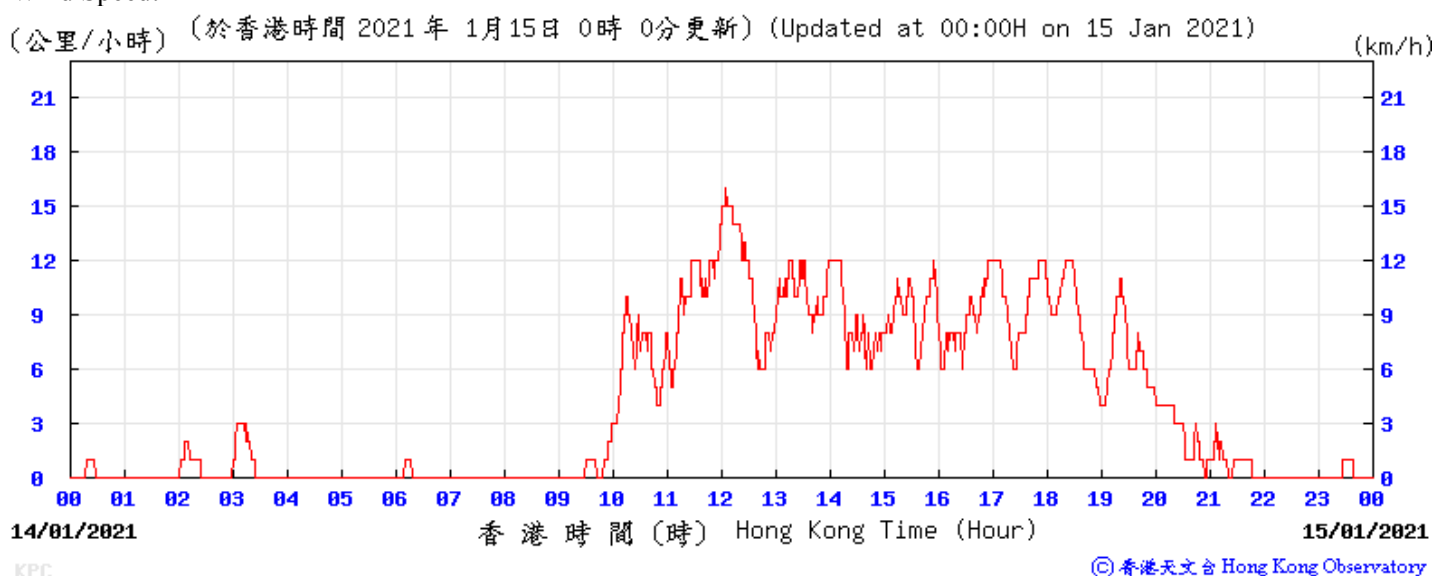
KPC  
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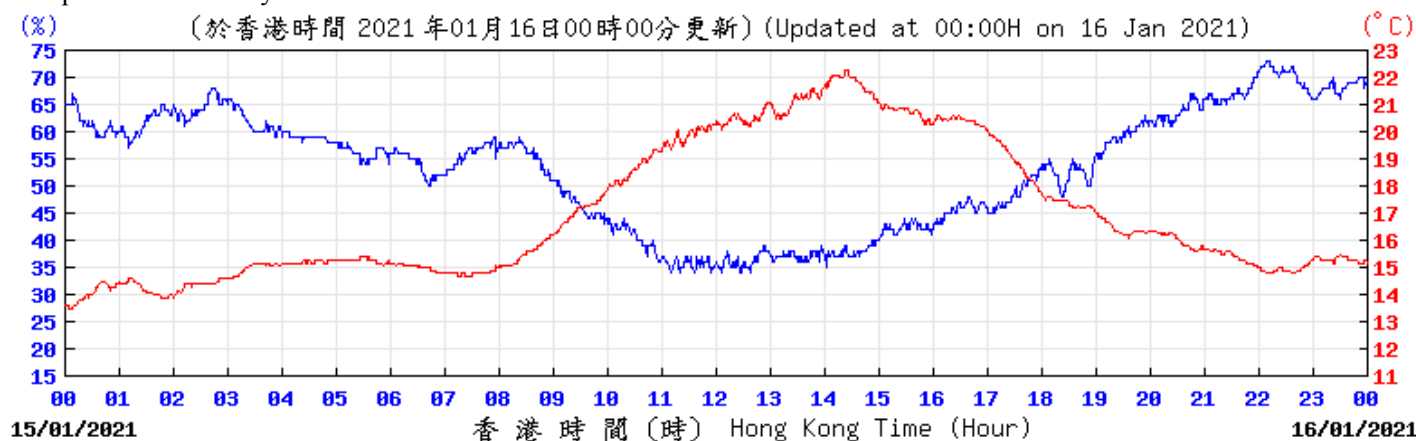
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Wind Direction:



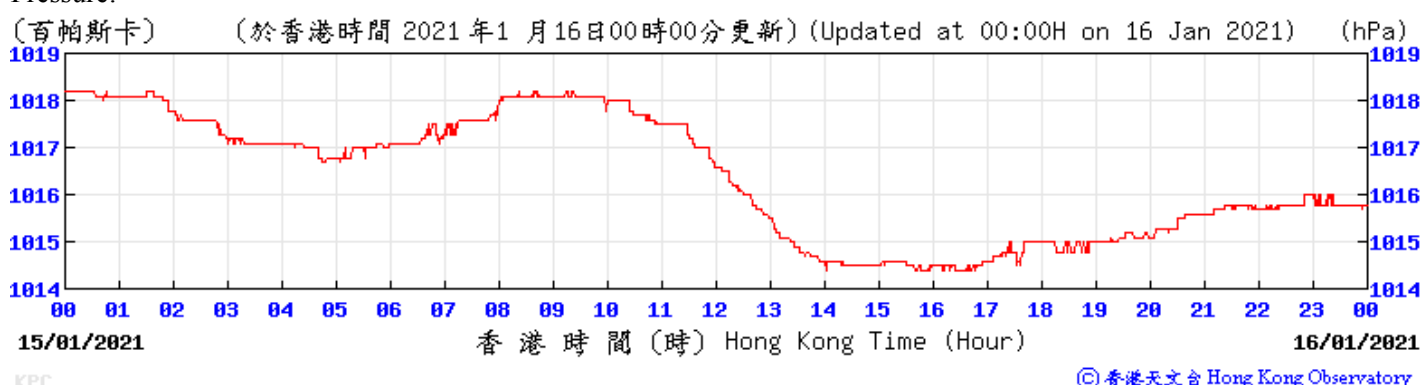
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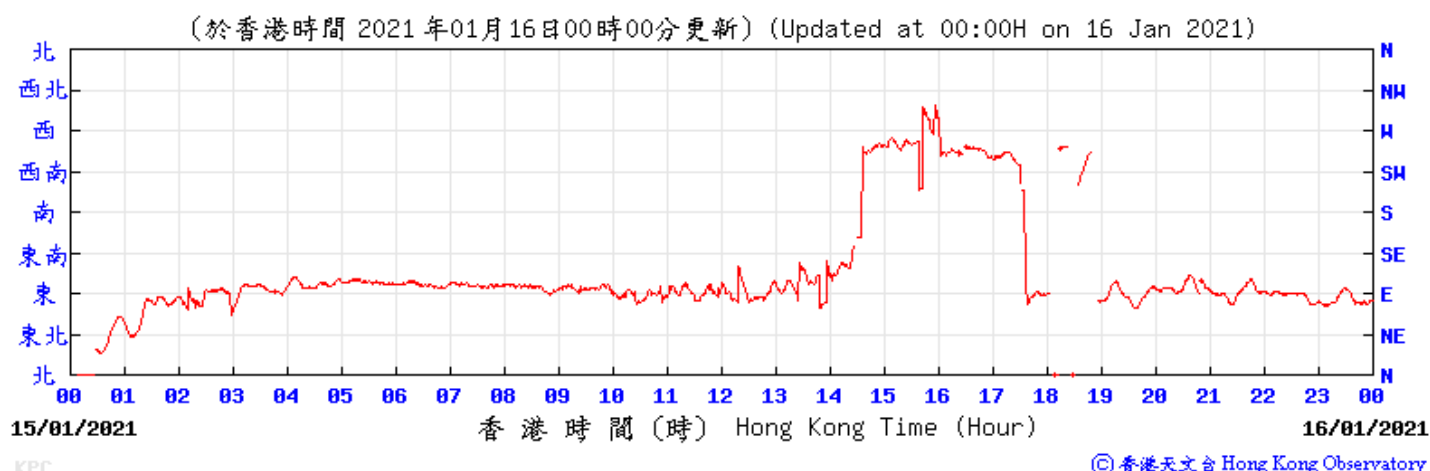
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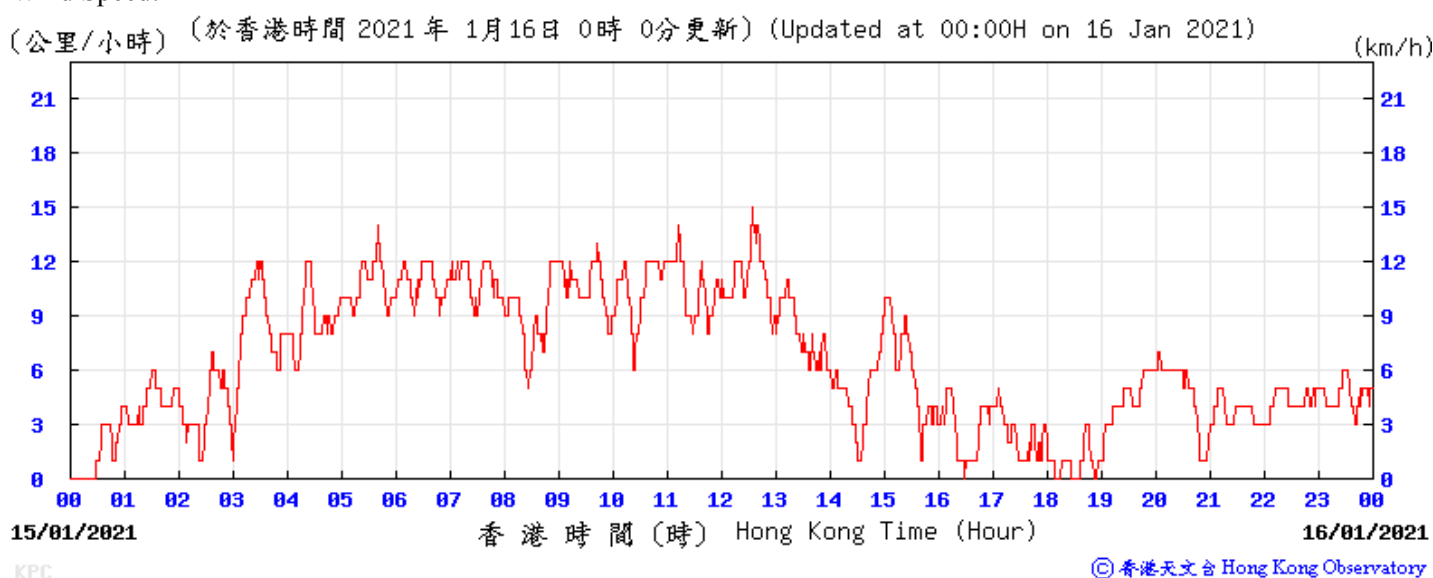
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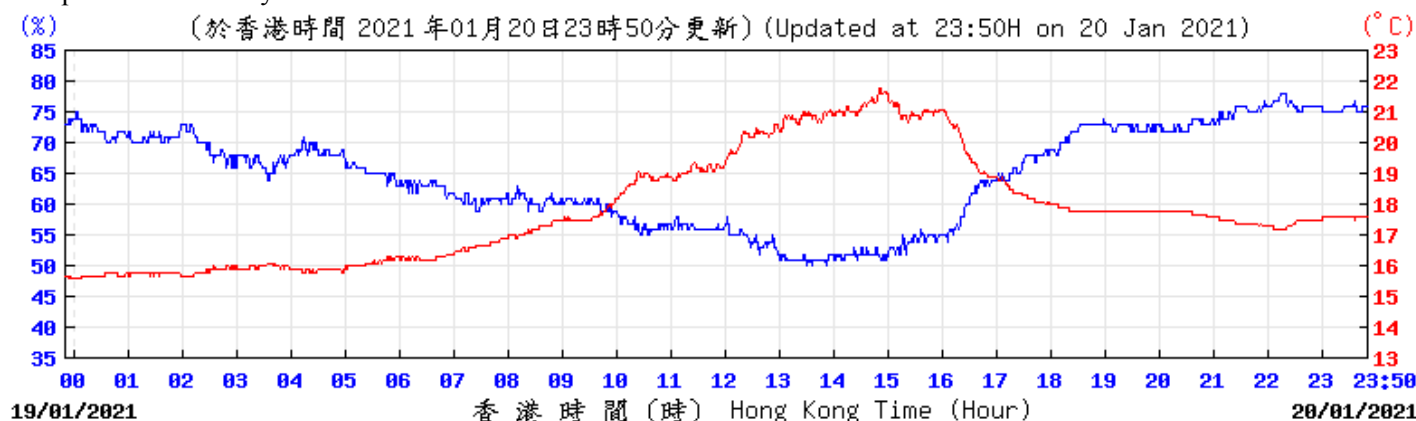
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## Wind Speed:

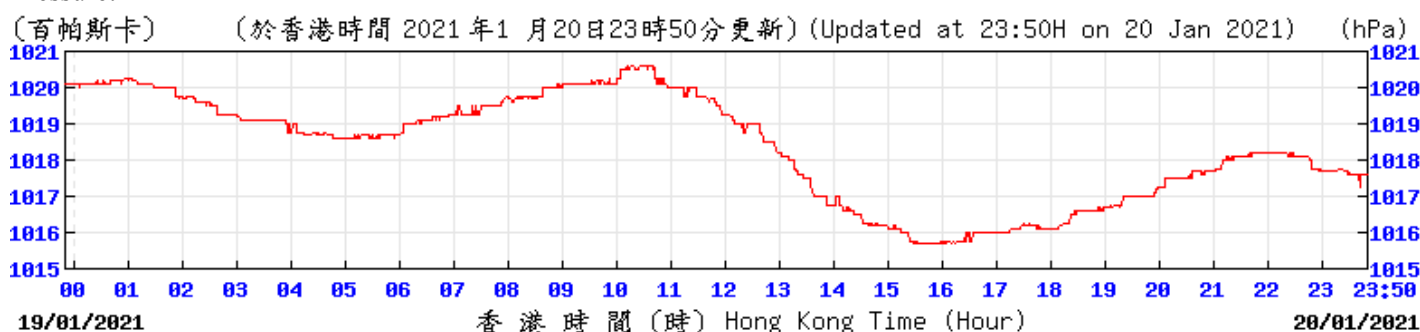


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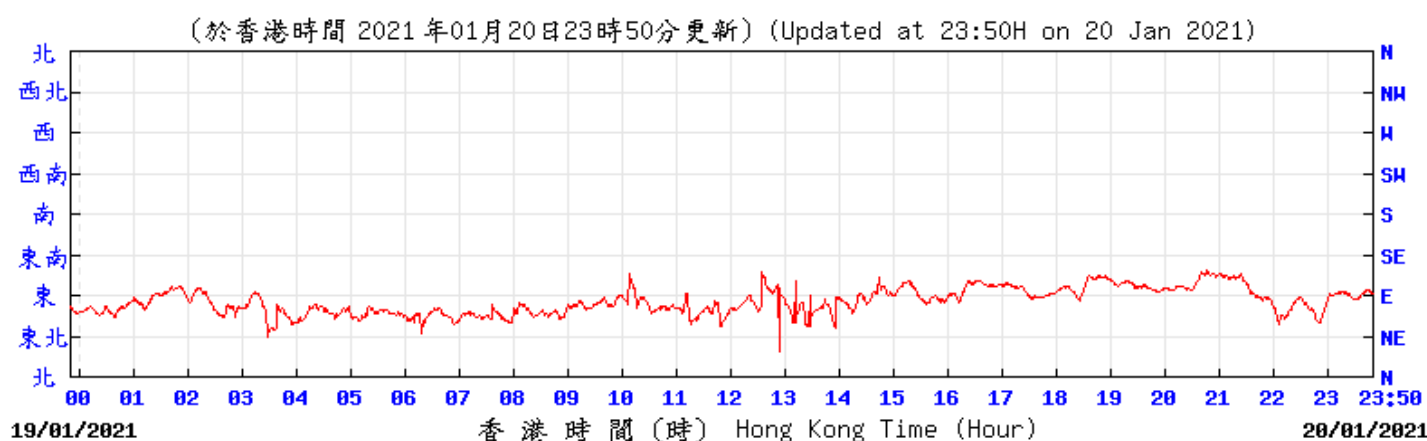
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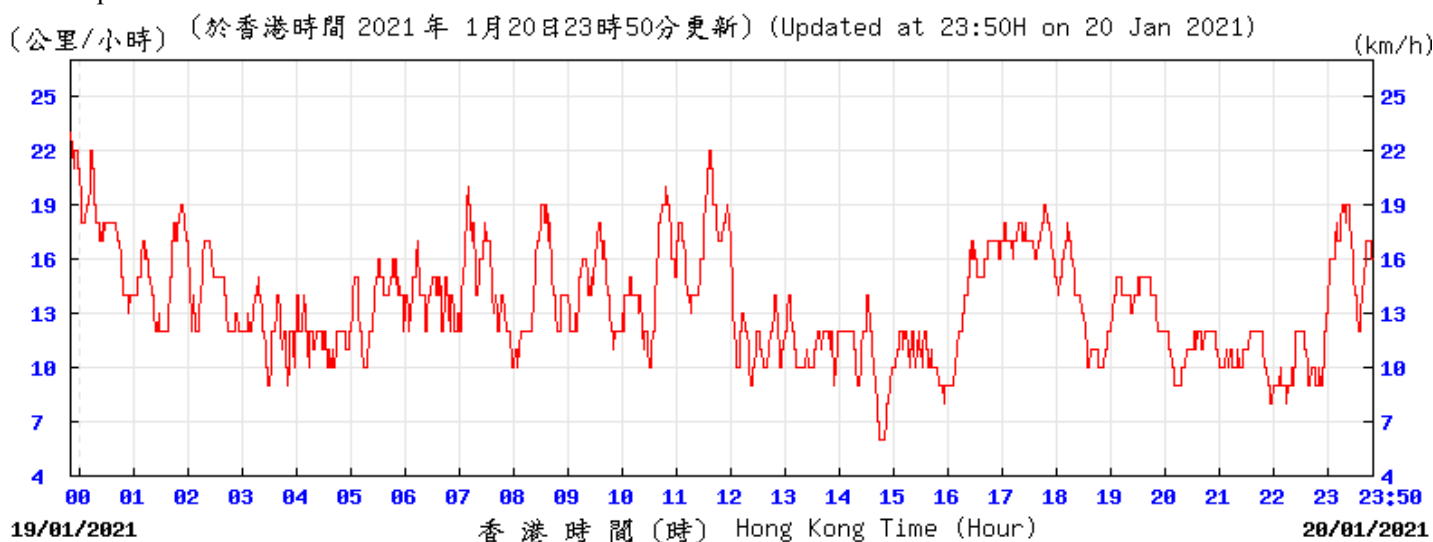
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## Wind Direction:



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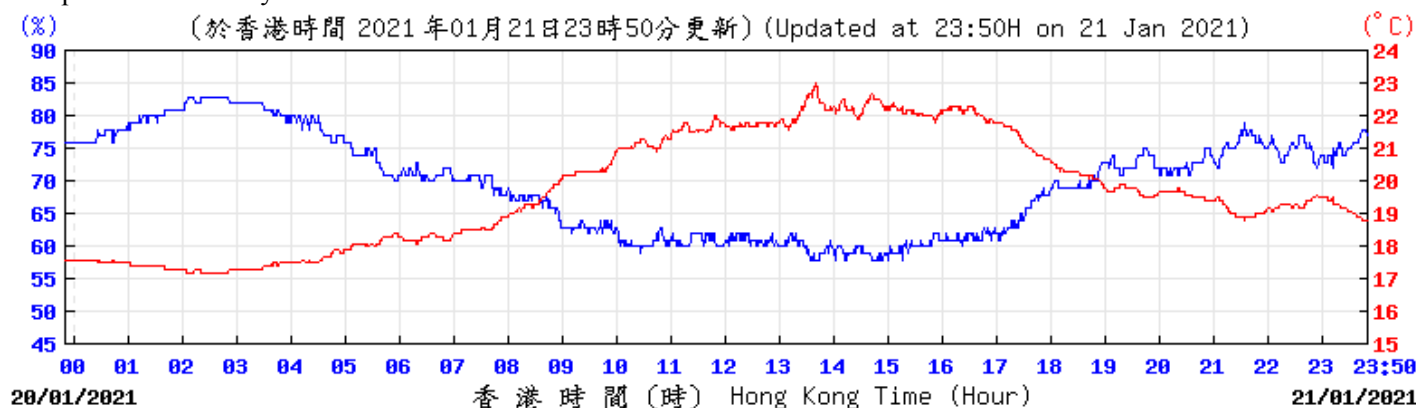
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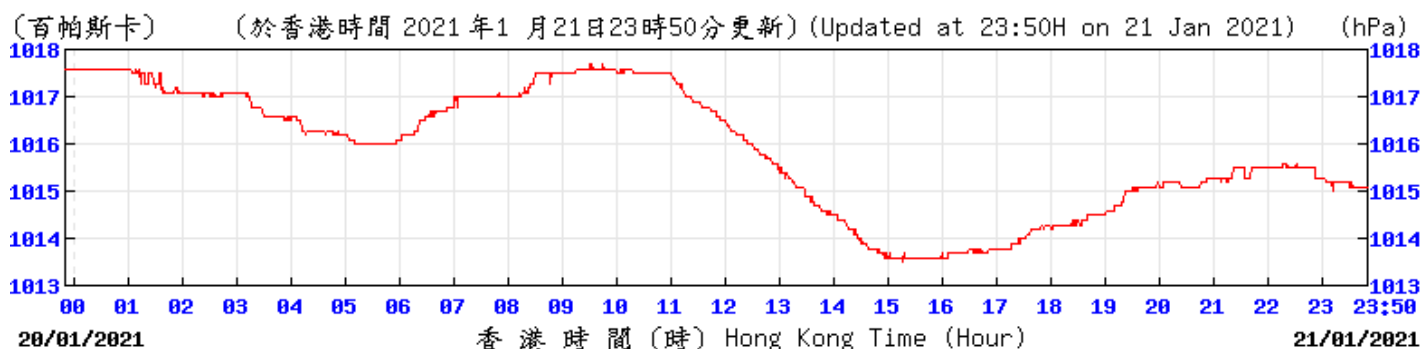


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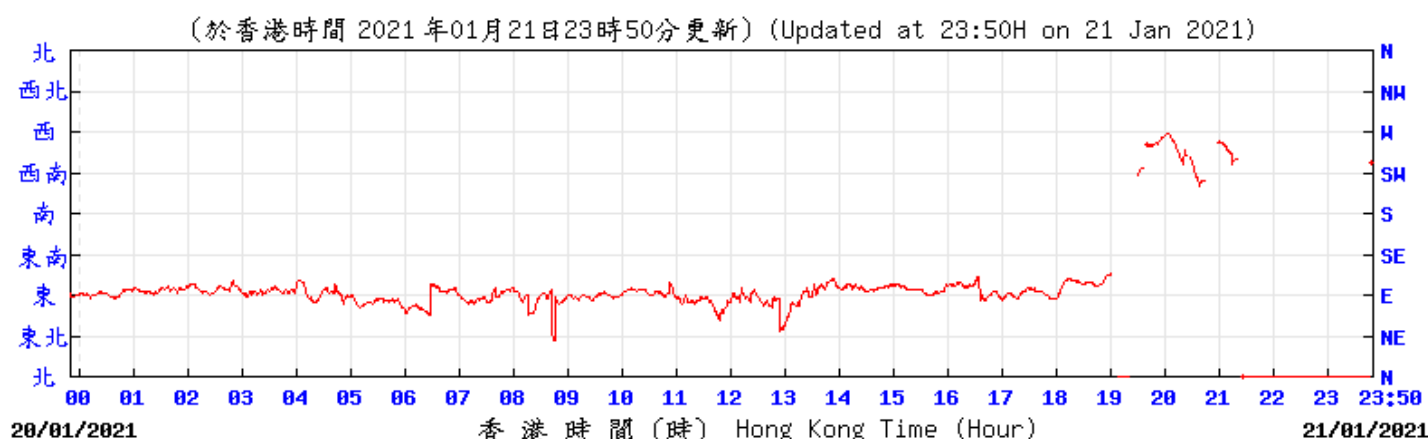
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## Pressure:



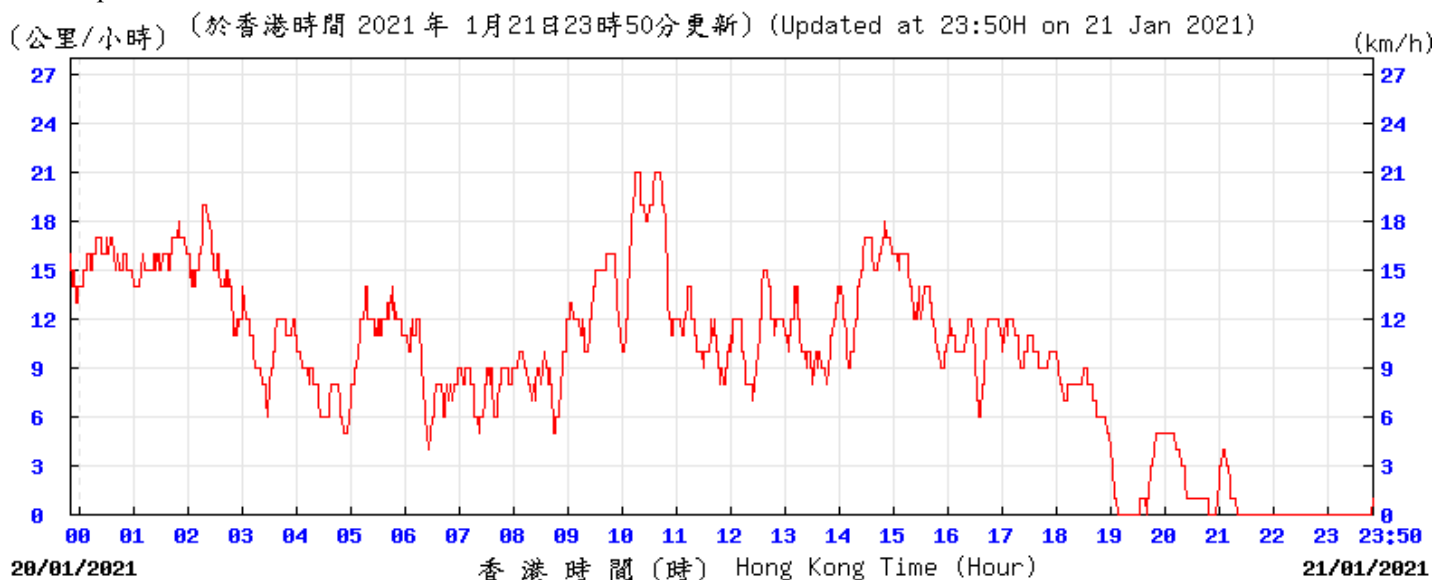
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## Wind Direction:



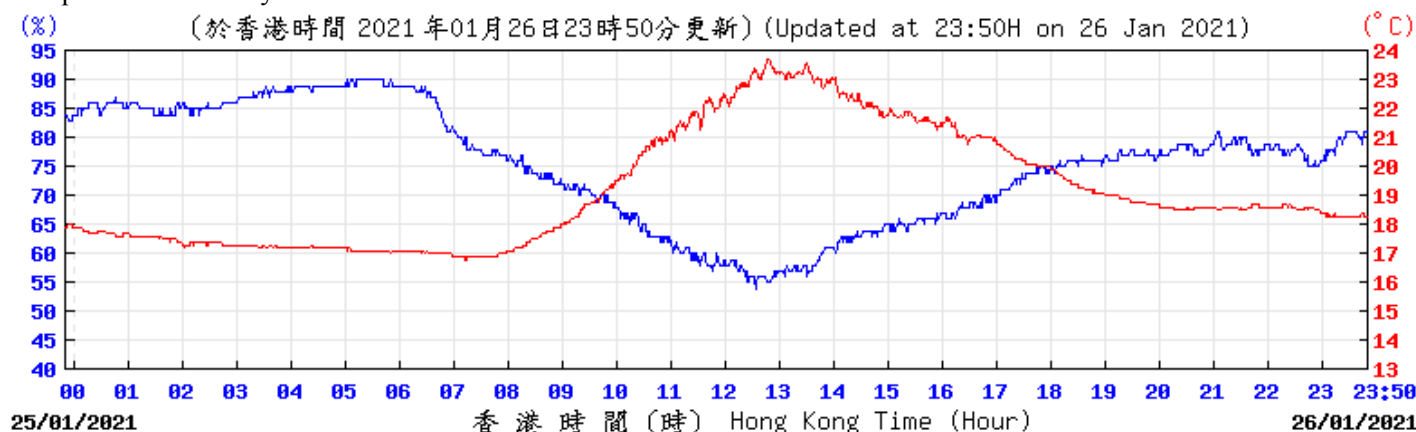
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## Wind Speed:

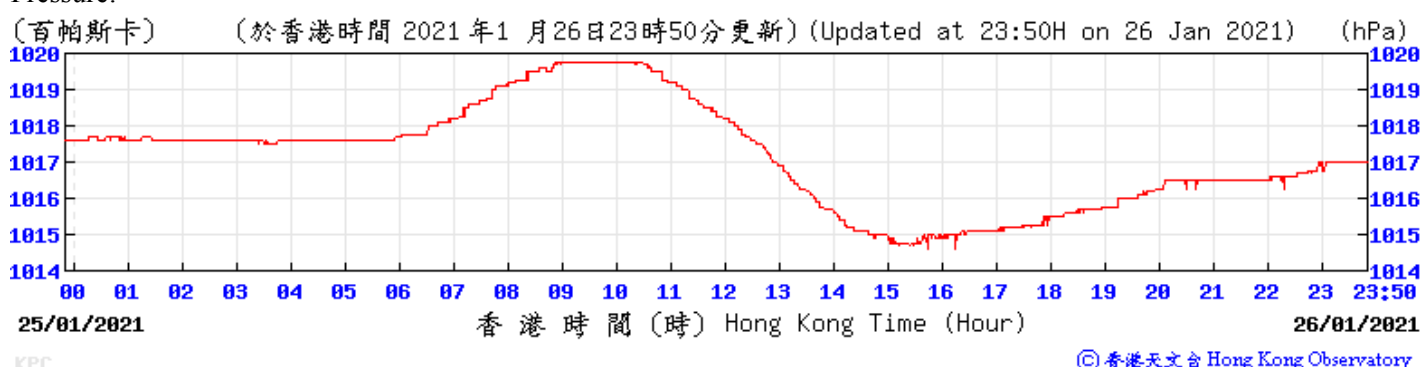


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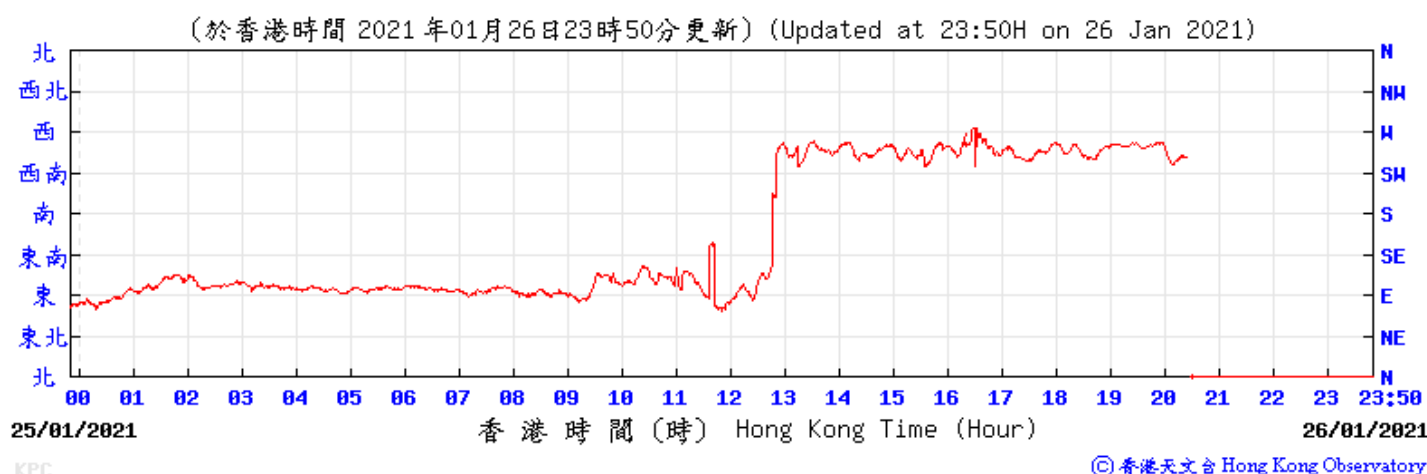
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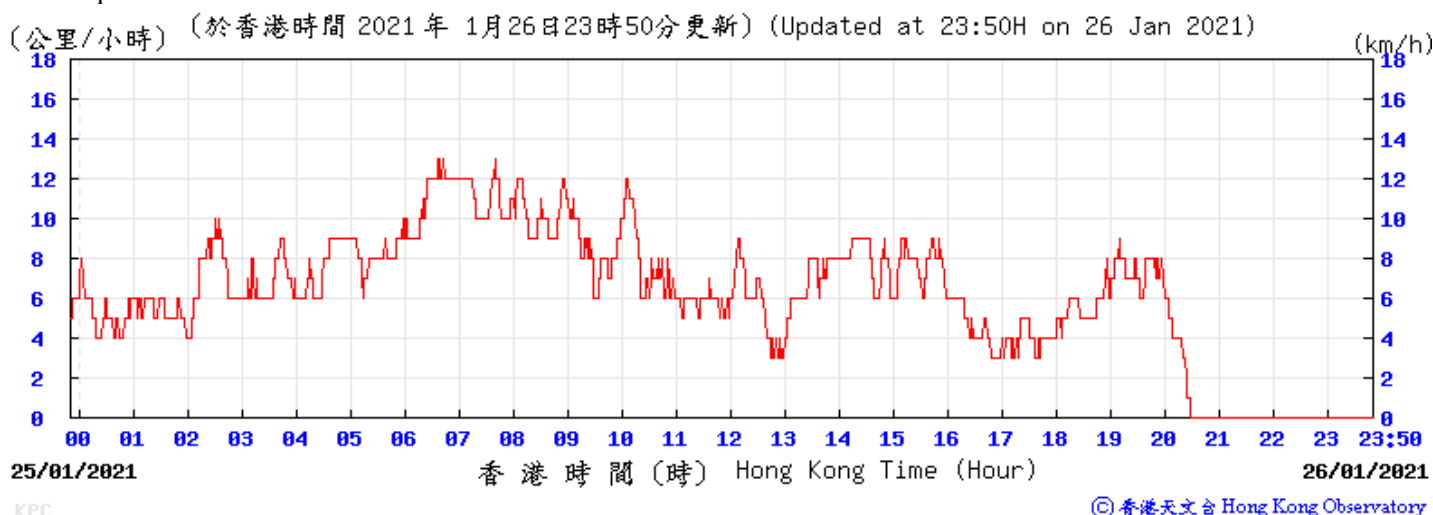
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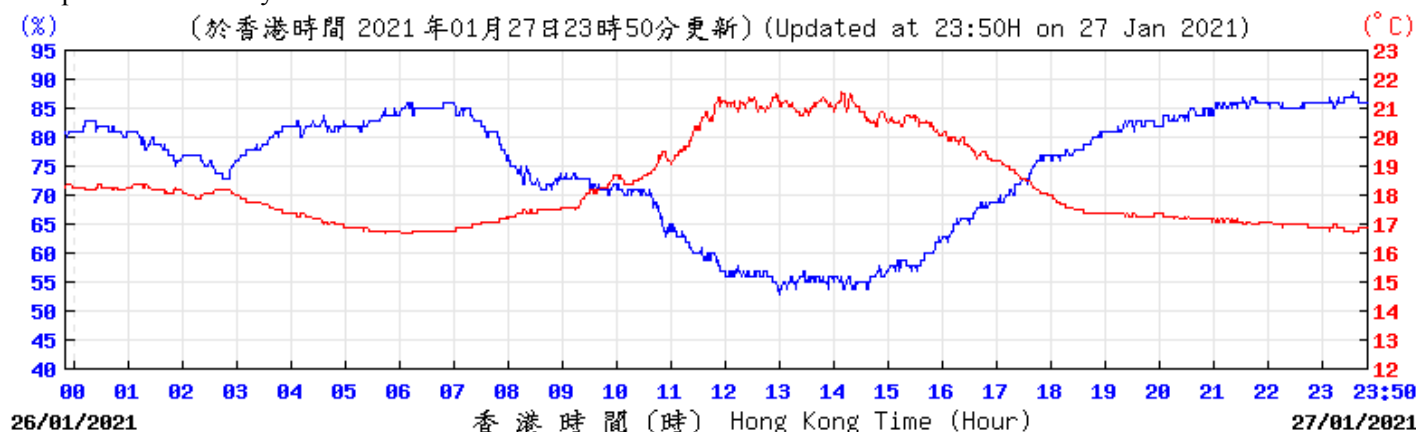
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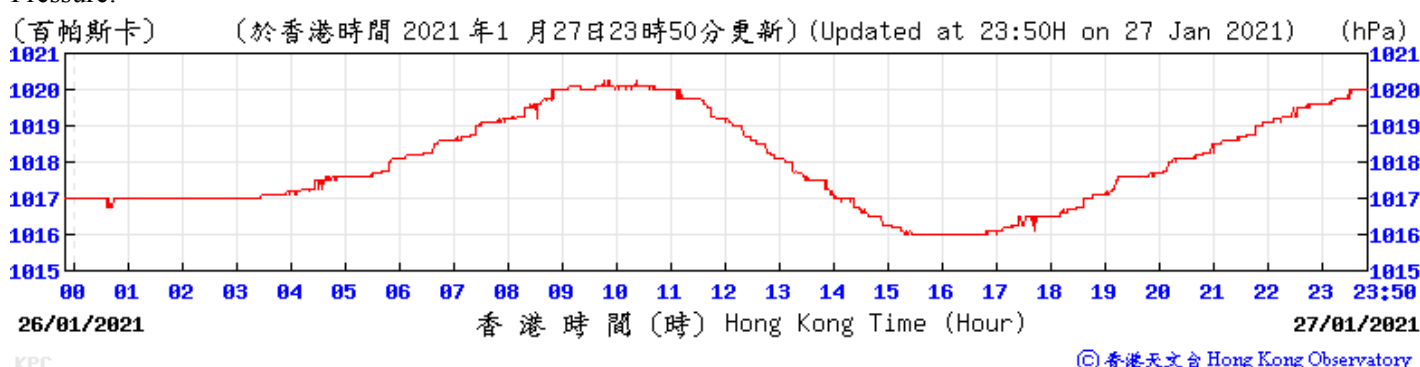
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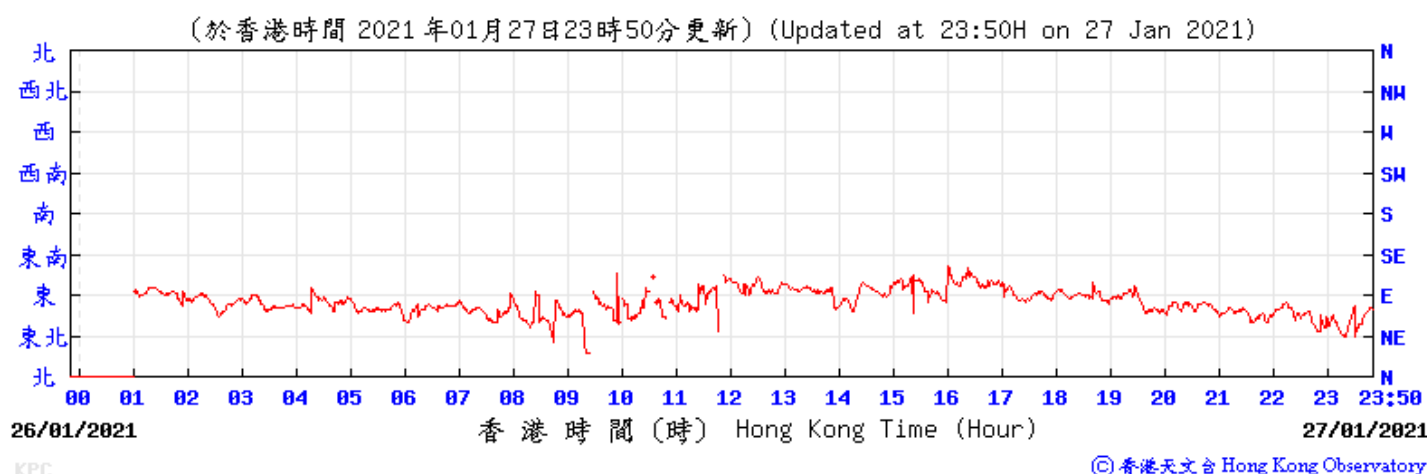
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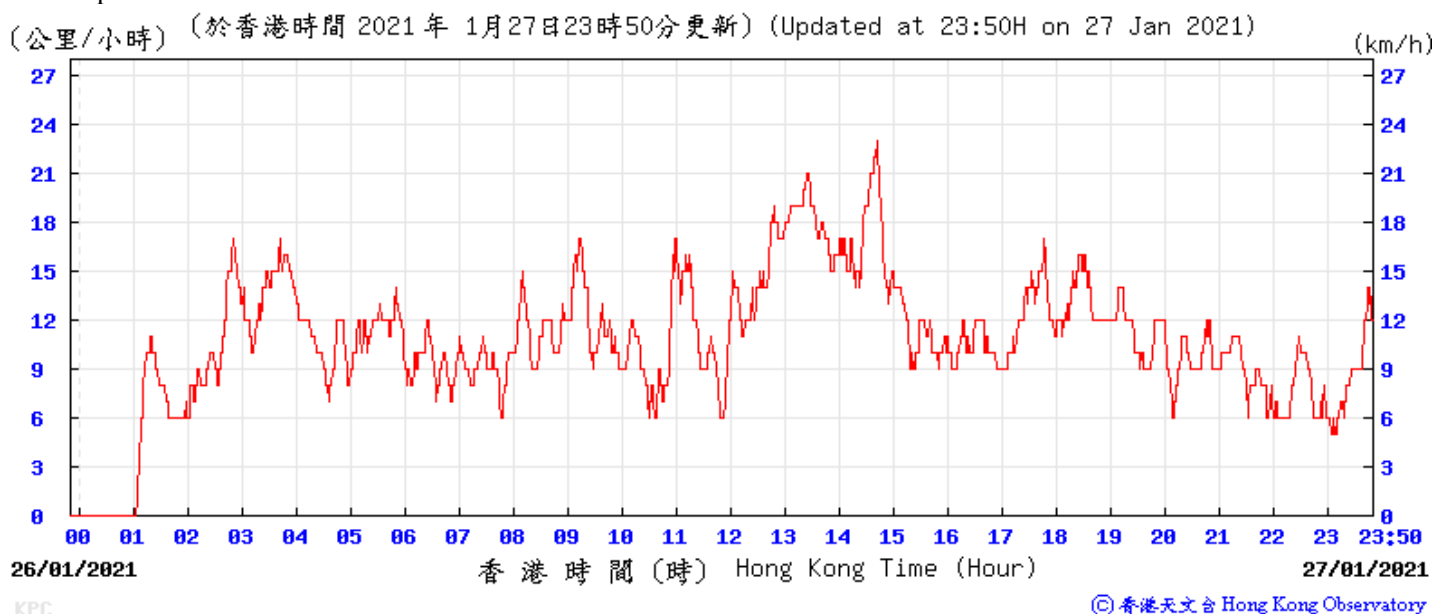
## Pressure:



## Wind Direction:



## Wind Speed:



## **I. Waste Flow table**

**Table I-1: Monthly Waste Flow Table for Zone 2A**

| Month            | Actual Quantities of Inert C&D Materials Generated Monthly |                                      |                        |                          |                         |                               |                | Actual Quantities of C&D Materials Generated Monthly |                            |             |              |                |                             |
|------------------|--|--------------------------------------|------------------------|--------------------------|-------------------------|-------------------------------|----------------|--|----------------------------|-------------|--------------|----------------|-----------------------------|
|                  | Total Quantity Generated                                   | Hard Rocks and Large Broken Concrete | Reused in the Contract | Reused in other Projects | Disposed as Public Fill | Disposed to Srotting Facility | Imported Fill  | Metals   | Paper/ Cardboard Packaging | Plastics    | Wood/ Timber | Chemical Waste | Others, e.g. General Refuse |
|                  | (in tonnes)  | (in tonnes)                          | (in tonnes)            | (in tonnes)              | (in tonnes)             | (in tonnes)                   | (in tonnes)    | (in tonnes)  | (in tonnes)                | (in tonnes) | (in tonnes)  | (in tonnes)    | (in tonnes)                 |
| <b>2020</b>      |  |                                      |                        |                          |                         |                               |                |  |                            |             |              |                |                             |
| Oct              | 2623.48  | 0.00                                 | 0.00                   | 0.00                     | 2623.48                 | 0.00                          | 0.00           | 0.00   | 0.00                       | 0.00        | 0.00         | 0.00           | 21.94                       |
| Nov              | 8838.69  | 0.00                                 | 685.23                 | 1198.56                  | 6954.90                 | 0.00                          | 1194.93        | 0.00   | 0.00                       | 0.00        | 0.00         | 0.00           | 17.49                       |
| Dec              | 8890.70  | 0.00                                 | 510.59                 | 1675.21                  | 6704.90                 | 0.00                          | 51.51          | 0.00   | 0.00                       | 0.00        | 0.00         | 0.00           | 11.75                       |
| Sub-total (2020) | 20352.87   | 0.00                                 | 1195.82                | 2873.77                  | 16283.28                | 0.00                          | 1246.44        | 0.00   | 0.00                       | 0.00        | 0.00         | 0.00           | 51.18                       |
| <b>2021</b>      |  |                                      |                        |                          |                         |                               |                |  |                            |             |              |                |                             |
| Jan              | 6849.66  | 0.00                                 | 52.90                  | 0.00                     | 6796.76                 | 0.00                          | 0.00           | 0.00   | 0.00                       | 0.00        | 0.00         | 0.00           | 19.94                       |
| Sub-total (2020) | 6849.66  | 0.00                                 | 52.90                  | 0.00                     | 6796.76                 | 0.00                          | 0.00           | 0.00   | 0.00                       | 0.00        | 0.00         | 0.00           | 19.94                       |
| <b>Total</b>     | <b>28448.97</b>  | <b>0.00</b>                          | <b>1248.72</b>         | <b>2873.77</b>           | <b>23080.04</b>         | <b>0.00</b>                   | <b>1246.44</b> | <b>0.00</b>  | <b>0.00</b>                | <b>0.00</b> | <b>0.00</b>  | <b>0.00</b>    | <b>71.12</b>                |

Note:

- 215.99 tonnes, 6580.77 tonnes of inert C&D material were disposed of as public fill to Tseung Kwan O Area 137 Public Fill, and Tuen Mun Area 38 respectively in the reporting month.

## **J. Environmental Mitigation Measures – Implementation Status**

**Table J-1: Environmental Mitigation Measures Implementation Status (Jan 2021)**

| EM&A<br>Ref.                             | Recommendation Measures  | Implementation Stage              |
|--|--|-----------------------------------|
| <b>Air Quality Impact (Construction)</b> |  |                                   |
| 2.1                                      | <b>General Dust Control Measures</b><br>Frequent water spraying for active construction areas (12 times a day or once every one hour), including Heavy construction activities such as construction of buildings or roads, drilling, ground excavation, cut and fill operations (i.e., earth moving)   | ✓                                 |
| 2.1                                      | <b>Best Practice For Dust Control</b><br>The relevant best practices for dust control as stipulated in the Air Pollution Control (construction Dust) Regulation should be adopted to further reduce the construction dust impacts from the Project. These best practices include:<br><i>Good Site Management</i> <ul style="list-style-type: none"> <li>• Good site management is important to help reducing potential air quality impact down to an acceptable level. As a general guide, the Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimise the release of visible dust emission. Any piles of materials accumulated on or around the work areas should be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimising generation of fugitive dust emissions. The material should be handled properly to prevent fugitive dust emission before cleaning.</li> </ul> <i>Disturbed Parts of the Roads</i> <ul style="list-style-type: none"> <li>• Each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or</li> <li>• Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet.</li> </ul> <i>Exposed Earth</i> <ul style="list-style-type: none"> <li>• Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies.</li> </ul> | Obs                               |
|  |  | ✓                                 |
|  |  | Obs                               |
|  |  | N/A                               |
|  |  | No exposed earth in this project. |

| EM&A<br>Ref. | Recommendation Measures   | Implementation Stage                    |
|--------------|---|---|
|              | <p><i>Loading, Unloading or Transfer of Dusty Materials</i></p> <ul style="list-style-type: none"> <li>All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet.</li> </ul>   | ✓                                       |
|              | <p><i>Debris Handling</i></p> <ul style="list-style-type: none"> <li>Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides.</li> <li>Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped.</li> </ul>   | ✓<br><br>N/A<br>No debris chute on-site |
|              | <p><i>Transport of Dusty Materials</i></p> <ul style="list-style-type: none"> <li>Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards.</li> </ul>   | ✓                                       |
|              | <p><i>Wheel washing</i></p> <ul style="list-style-type: none"> <li>Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels.</li> </ul>  | ✓                                       |
|              | <p><i>Use of vehicles</i></p> <ul style="list-style-type: none"> <li>The speed of the trucks within the site should be controlled to about 10km/hour in order to reduce adverse dust impacts and secure the safe movement around the site.</li> <li>Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels.</li> <li>Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle.</li> </ul> | ✓<br><br>✓<br><br>✓                     |
|              | <p><i>Site hoarding</i></p> <ul style="list-style-type: none"> <li>Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit.</li> </ul>  | ✓                                       |
| 2.1          | <p><b>Best Practicable Means for Cement Works (Concrete Batching Plant)</b></p> <p>The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for</p>  |   |



| EM&A<br>Ref.                       | Recommendation Measures  | Implementation Stage  |
|------------------------------------|--|---|
|                                    | <p>Cement Works (Concrete Batching Plant) BPM 3/2(93) should be followed and implemented to further reduce the construction dust impacts of the Project. These best practices include:</p> <p><i>Exhaust from Dust Arrestment Plant</i></p> <ul style="list-style-type: none"> <li>Wherever possible the final discharge point from particulate matter arrestment plant, where is not necessary to achieve dispersion from residual pollutants, should be at low level to minimise the effect on the local community in the case of abnormal emissions and to facilitate maintenance and inspection</li> </ul> <p><i>Emission Limits</i></p> <ul style="list-style-type: none"> <li>All emissions to air, other than steam or water vapour, shall be colourless and free from persistent mist or smoke</li> </ul> <p><i>Engineering Design/Technical Requirements</i></p> <ul style="list-style-type: none"> <li>As a general guidance, the loading, unloading, handling and storage of fuel, raw materials, products, wastes or by-products should be carried out in a manner so as to prevent the release of visible dust and/or other noxious or offensive emissions</li> </ul> | <p>N/A</p> <p>No concrete batching plant in this project.</p> <p>N/A</p> <p>No concrete batching plant in this project.</p> <p>N/A</p> <p>No concrete batching plant in this project.</p> |
|                                    | <p><b>Non-Road Mobile Machinery (NRMM):</b></p> <p>All NRMMs operating on-site which are subject to emission control of Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation are approved/exempted (as the case may be) and affixed with the requisite approval/exemption labels.</p>   | ✓   |
| <b>Noise Impact (Construction)</b> |  |   |
| 3.1                                | <p><b>Good Site Practice</b></p> <p>Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during each phase of construction:</p> <ul style="list-style-type: none"> <li>only well-maintained plant to be operated on-site and plant should be serviced regularly during the</li> </ul>  | ✓   |

| EM&A<br>Ref. | Recommendation Measures   | Implementation Stage                |
|--------------|---|-------------------------------------|
|              | <p>construction works;</p> <ul style="list-style-type: none"> <li>• machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum</li> <li>• plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs;</li> <li>• mobile plant should be sited as far away from NSRs as possible; and</li> <li>• material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site construction activities.</li> </ul> | <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> |
| 3.1          | <p><b>Adoption of Quieter PME</b></p> <p>The recommended quieter PME adopted in the assessment were taken from the EPD's QPME Inventory and "Sound Power Levels of Other Commonly Used PME" are presented in <b>Table 4.26</b> in the EIA report. It should be noted that the silenced PME selected for assessment can be found in Hong Kong.</p>   | ✓                                   |
| 3.1          | <p><b>Use of Movable Noise Barriers</b></p> <p>Movable noise barriers can be very effective in screening noise from particular items of plant when constructing the Project. Noise barriers located along the active works area close to the noise generating component of a PME could produce at least 10 dB(A) screening for stationary plant and 5 dB(A) for mobile plant provided the direct line of sight between the PME and the NSRs is blocked.</p>   | Rem                                 |
| 3.1          | <p><b>Use of Noise Enclosure/ Acoustic Shed</b></p> <p>The use of noise enclosure or acoustic shed is to cover stationary PME such as air compressor and concrete pump. With the adoption of the noise enclosure, the PME could be completely screened, and noise reduction of 15 dB(A) can be achieved according to the EIAO Guidance Note No. 9/2010.</p>   | ✓                                   |
| 3.1          | <p><b>Use of Noise Insulating Fabric</b></p>  | ✓                                   |



EM&A  
Ref.

Recommendation Measures

Implementation Stage

Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the WKCDA's Contractor prior to the commencement of construction.

- |   |     |
|---|-----|
| <ul style="list-style-type: none"> <li>• All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.</li> </ul>   | Obs |
| <ul style="list-style-type: none"> <li>• Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities.</li> </ul>   | ✓   |
| <ul style="list-style-type: none"> <li>• All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exit where practicable. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains.</li> </ul> | ✓   |
| <ul style="list-style-type: none"> <li>• Open stockpiles of construction materials or construction wastes onsite should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.</li> </ul>  | ✓   |
| <ul style="list-style-type: none"> <li>• Manholes (including newly constructed ones) should be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and stormwater runoff being directed into foul sewers.</li> </ul>  | ✓   |
| <ul style="list-style-type: none"> <li>• Precautions should be taken at any time of the year when rainstorms are likely. Actions should be taken</li> </ul>   | Obs |

| EM&A | Recommendation Measures   | Implementation Stage  |
|------|---|---|
| Ref. |   |   |
|      | <p>when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC Note PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.</p> <ul style="list-style-type: none"> <li>Bentonite slurries used in piling or slurry walling should be reconditioned and reused wherever practicable. Temporary enclosed storage locations should be provided on-site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.</li> </ul>  | <p>N/A</p> <p>No bentonite slurries are used in this project.</p>   |
| 4.1  | <p><b>Barging facilities and activities</b></p> <p>Recommendations for good site practices during operation of the proposed barging point include:</p> <ul style="list-style-type: none"> <li>All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;</li> <li>Loading of barges and hoppers should be controlled to prevent splashing of material into the surrounding water. Barges or hoppers should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation;</li> <li>All hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; and</li> <li>Construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site.</li> </ul> | <p>N/A</p> <p>No barging facilities in this project at this stage.</p> <p>N/A</p> <p>No barging facilities in this project at this stage.</p> <p>N/A</p> <p>No barging facilities in this project at this stage.</p> <p>N/A</p> <p>No barging facilities in this project at this stage.</p> |
| 4.1  | <b>Sewage effluent from construction workforce</b>  | ✓   |

| EM&A<br>Ref.  | Recommendation Measures  | Implementation Stage |
|---|--|----------------------|
|   | Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.   |                      |
| 4.1   | <b>General construction activities</b>   |                      |
|   | <ul style="list-style-type: none"> <li>Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby storm water drain. Stockpiles of cement and other construction materials should be kept covered when not being used.</li> </ul>  | ✓                    |
|   | <ul style="list-style-type: none"> <li>Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby storm water drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event.</li> </ul> | ✓                    |
| <b>Waste Management Implications (Construction)</b> |  |                      |
| 6.1   | <b>Good Site Practices</b>   |                      |
|   | Recommendations for good site practices during the construction activities include:  |                      |
|   | <ul style="list-style-type: none"> <li>Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site</li> </ul>  | ✓                    |
|   | <ul style="list-style-type: none"> <li>Training of site personnel in proper waste management and chemical handling procedures</li> </ul>   | ✓                    |
|   | <ul style="list-style-type: none"> <li>Provision of sufficient waste disposal points and regular collection of waste</li> </ul>  | ✓                    |
|   | <ul style="list-style-type: none"> <li>Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by either covering trucks or by transporting wastes in enclosed containers</li> </ul>   | ✓                    |
|   | <ul style="list-style-type: none"> <li>Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust</li> </ul>  | ✓                    |

| EM&A<br>Ref. | Recommendation Measures  | Implementation Stage      |
|--------------|--|---------------------------|
|              | <p>introduction to public roads</p> <ul style="list-style-type: none"> <li>Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting the inert or non-inert C&amp;D materials is not anticipated</li> </ul>  | ✓                         |
| 6.1          | <p><b>Waste Reduction Measures</b></p> <p>Recommendations to achieve waste reduction include:</p> <ul style="list-style-type: none"> <li>Sort inert C&amp;D material to recover any recyclable portions such as metals</li> <li>Segregation and storage of different types of waste in different containers or skips to enhance reuse or recycling of materials and their proper disposal</li> <li>Encourage collection of recyclable waste such as waste paper and aluminium cans by providing separate labelled bins to enable such waste to be segregated from other general refuse generated by the work force</li> <li>Proper site practices to minimise the potential for damage or contamination of inert C&amp;D materials</li> <li>Plan the use of construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of wastes</li> </ul> | <br>✓<br>✓<br>✓<br>✓<br>✓ |
| 6.1          | <p><b>Inert and Non-inert C&amp;D Materials</b></p> <p>In order to minimise impacts resulting from collection and transportation of inert C&amp;D material for off-site disposal, the excavated materials should be reused on-site as fill material as far as practicable. In addition, inert C&amp;D material generated from excavation works could be reused as fill materials in local projects that require public fill for reclamation.</p> <ul style="list-style-type: none"> <li>The surplus inert C&amp;D material will be disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong.</li> <li>Liaison with the CEDD Public Fill Committee (PFC) on the allocation of space for disposal of the inert C&amp;D materials at PFRF is underway. No construction work is allowed to proceed until all issues on management of</li> </ul>               | <br><br>✓<br>✓            |

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inert C&D materials have been resolved and all relevant arrangements have been endorsed by the relevant authorities including PFC and EPD.

- The C&D materials generated from general site clearance should be sorted on site to segregate any inert materials for reuse or disposal of at PFRFs whereas the non-inert materials will be disposed of at the designated landfill site. ✓
- In order to monitor the disposal of inert and non-inert C&D materials at respectively PFRFs and the designated landfill site, and to control fly-tipping, it is recommended that the Contractor should follow the Technical Circular (Works) No. 6/2010 for Trip Ticket System for Disposal of Construction & Demolition Materials issued by Development Bureau. In addition, it is also recommended that the Contractor should prepare and implement a Waste Management Plan detailing their various waste arising and waste management practices in accordance with the relevant requirements of the Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site. ✓

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#### 6.1 Chemical Waste

- If chemical wastes are produced at the construction site, the Contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the “Code of Practice on the Packaging Labelling and Storage of Chemical Wastes”. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor should use a licensed collector to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. ✓



| EM&A Ref.                                | Recommendation Measures  | Implementation Stage   |
|--|--|--|
|  | <ul style="list-style-type: none"> <li>Potential environmental impacts arising from the handling activities (including storage, collection, transportation and disposal of chemical waste) are expected to be minimal with the implementation of appropriate mitigation measures as recommended.</li> </ul>  | ✓  |
| 6.1                                      | <p><b>General Refuse</b></p> <p>General refuse should be stored in enclosed bins or compaction units separated from inert C&amp;D materials. A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from inert C&amp;D materials. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.</p>   | ✓  |
| <b>Land Contamination (Construction)</b> |  |  |
| 7.1                                      | <p>The potential for land contamination issues at the TST Fire Station due to its future relocation will be confirmed by site investigation after land acquisition. Where necessary, mitigation measures for minimising potential exposure to contaminated materials (if any) or remediation measures will be identified. If contaminated land is identified (e.g., during decommissioning of fuel oil storage tanks) after the commencement of works, mitigation measures are proposed in order to minimise the potentially adverse effects on the health and safety of construction workers and impacts arising from the disposal of potentially contaminated materials. The following measures are proposed for excavation and transportation of contaminated material:</p> <ul style="list-style-type: none"> <li>To minimize the chance for construction workers to come into contact with any contaminated materials, bulk earth-moving excavation equipment should be employed;</li> <li>Contact with contaminated materials can be minimised by wearing appropriate clothing and personal protective equipment such as gloves and masks (especially when interacting directly with contaminated</li> </ul> | <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> <p>N/A</p> <p>TST Fire Station is out of this</p> |

| EM&A<br>Ref. | Recommendation Measures  | Implementation Stage   |
|--------------|--|--|
|              | material), provision of washing facilities and prohibition of smoking and eating on site;  | project boundary, no mitigation measure is required.   |
|              | <ul style="list-style-type: none"> <li>• Stockpiling of contaminated excavated materials on site should be avoided as far as possible;</li> </ul>  | <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> |
|              | <ul style="list-style-type: none"> <li>• The use of contaminated soil for landscaping purpose should be avoided unless pre-treatment was carried out;</li> </ul>   | <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> |
|              | <ul style="list-style-type: none"> <li>• Vehicles containing any contaminated excavated materials should be suitably covered to reduce dust emissions and/or release of contaminated wastewater;</li> </ul>                                | <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> |
|              | <ul style="list-style-type: none"> <li>• Truck bodies and tailgates should be sealed to stop any discharge;</li> </ul>   | <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> |
|              | <ul style="list-style-type: none"> <li>• Only licensed waste haulers should be used to collect and transport contaminated material to treatment/disposal site and should be equipped with tracking system to avoid fly tipping;</li> </ul> | <p>N/A</p> <p>TST Fire Station is out of this project boundary, no mitigation measure is required.</p> |

| EM&A Ref.                                  | Recommendation Measures  | Implementation Stage  |
|--|--|---|
|  | <ul style="list-style-type: none"><li>Speed control for trucks carrying contaminated materials should be exercised;</li></ul>  | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
|  | <ul style="list-style-type: none"><li>Observe all relevant regulations in relation to waste handling, such as Waste Disposal Ordinance (Cap. 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354) and obtain all necessary permits where required; and</li></ul>  | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
|  | <ul style="list-style-type: none"><li>Maintain records of waste generation and disposal quantities and disposal arrangements.</li></ul>  | N/A<br>TST Fire Station is out of this project boundary, no mitigation measure is required. |
| Ecological Impact (Construction)           |  |   |
|  | No mitigation measure is required.   |   |
| Landscape and Visual Impact (Construction) |  |   |
| Table 9.1 (CM1)                            | Trees should be retained in situ on site as far as possible. Should tree removal be unavoidable due to construction impacts, trees will be transplanted or felled with reference to the stated criteria in the Tree Removal Applications to be submitted to relevant government departments for approval in accordance to ETWB TCW No. 29/2004 and 3/2006. | ✓   |
| Table 9.1 (CM2)                            | Compensatory tree planting shall be incorporated to the proposed project and maximize the new tree, shrubs and other vegetation planting to compensate tree felled and vegetation removed. Also, implementation of compensatory planting should be of a ratio not less than 1:1 in terms of quality and quantity within the site.                          | N/A<br>Compensatory tree planting is being reviewed.  |

| EM&A<br>Ref.       | Recommendation Measures  | Implementation Stage  |
|--------------------|--|---|
| Table 9.1<br>(CM3) | Buffer trees for screening purposes to soften the hard architectural and engineering structures and facilities.  | N/A<br>Roof garden is designed to be built, but it has not been completed yet.  |
| Table 9.1<br>(CM4) | Softscape treatments such as vertical green wall panel /planting of climbing and/or weeping plants, etc, to maximize the green coverage and soften the hard architectural and engineering structures and facilities. | N/A<br>Climbing or weeping plants are designed to be planted, but proposal is being reviewed for the planting location. |
| Table 9.1<br>(CM5) | Roof greening by means of intensive and extensive green roof to maximize the green coverage and improve aesthetic appeal and visual quality of the building/structure.   | N/A<br>Roof garden is designed to be built, but it has not been completed yet.  |
| Table 9.1<br>(CM6) | Sensitive streetscape design should be incorporated along all new roads and streets.   | N/A<br>Greening along the seafront is proposed, and under review.   |
| Table 9.1<br>(CM7) | Structure, ornamental planting shall be provided along amenity strips to enhance the landscape quality.  | N/A<br>Gardens are designed to be built, and under review.  |
| Table 9.1<br>(CM8) | Landscape design shall be incorporated to architectural and engineering structures in order to provide aesthetically pleasing designs.   | N/A<br>Roof garden is designed to be built, and under review.   |

| EM&A<br>Ref.        | Recommendation Measures  | Implementation Stage                              |
|---------------------|--|---|
| Table 9.1<br>(CM9)  | Minimize the structure of marine facilities to be built on the seabed and foreshore in order to minimize the affected extent to the waterbody      | N/A<br>No marine facilities for this project.     |
| Table 9.2<br>(MCP1) | Use of decorative screen hoarding/boards   | ✓   |
| Table 9.2<br>(MCP2) | Early introduction of landscape treatments   | N/A<br>No landscape treatments during this stage. |
| Table 9.2<br>(MCP3) | Adoption of light colour for the temporary ventilation shafts for the basement during the transition period.                                       | N/A<br>No ventilation shafts for this project.    |
| Table 9.2<br>(MCP4) | Control of night time lighting   | ✓   |
| Table 9.2<br>(MCP5) | Use of greenery such as grass cover for the temporary open areas will help achieve the visual balance and soften the hard edges of the structures. | N/A<br>No temporary open areas for this project.  |

N/A - Not Applicable

✓ - Implemented

Obs - Observed

Rem - Reminder

## **K. Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions**

Cumulative statistics for complaints, notifications of summons and successful prosecutions for the Project account for period starting from the date of commencement of construction works (i.e. 3 October 2020 for Zone 2A Foundation, Excavation and Lateral Support Works) to the end of the reporting month and are summarised in the Table K-1 below respectively.

**Table K-1: Statistics for complaints, notifications of summons and successful prosecutions for Zone 2A Foundation, Excavation and Lateral Support Works**

| Reporting Period                                      | Cumulative Statistics |                          |                         |
|---|-----------------------|--------------------------|-------------------------|
|   | Complaints            | Notifications of summons | Successful prosecutions |
| This reporting month                                  | 1                     | 0                        | 0                       |
| From 03 October 2020 to<br>end of the reporting month | 3                     | 0                        | 0                       |

# END OF THE REPORT