Development at West Kowloon Cultural District

Monthly Environmental Monitoring and Audit (EM&A) Report for October 2020

09 November 2020

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:

CK Wu
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West Kowloon Cultural District Authority

Date 12 November 2020

Verified by:

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Date 12 NOV 2020

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

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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 October to 31 October 2020.

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 in this reporting month.

Implementation of Mitigation Measures

Construction phase weekly site inspections were carried out on 5, 12, 19 and 30 October 2020 for M+ Museum and 7, 15, 21 and 28 October 2020 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.

EPD site inspection with contractor was conducted on 19 October 2020 at M+ Museum.

EPD site inspection with contractor was conducted on 9 October 2020 at Lyric Theatre Complex (L1 and L2 Contract).

Record of Complaints

No 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 M+ Museum scheduled to be commissioned in the coming month include:

- M+
  - Timber finishes works
  - Make good
  - T&C (MEP)
  - Landscaping works at 3/F (planting)
  - Cleaning works
- CSF
  - Make good
  - Cleaning works
  - Hand-over
- RDE
  - MEP installation works
  - T&C, ABWF works & make good
  - G/F paving works

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 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:

- Visual Mock Up
  - VMU interior work
- LTC construction

  Structure
  - Install and erection tower crane
  - Falsework and Formwork Erection
  - Reinforcement work
  - Concrete work

  BS Installation
- ASDA and Lyric Theatre Promenade
  - Structure works
- Remaining Works for M+ Promenade South
  - Site Clearance
  - Construct concrete slats deck

- DSC Cofferdam
  - Connection of DCS pipes
  - Construction of valve chamber, thrust blocks etc.
  - Back fill and removal of struts
- Modification to Existing Pump Cell
  - ABWF works
- Extended Basement
  - AWBF works
  - BS installation
- Vibration Isolation Spring System Installation
  - Install Remaining Spring
- Underpass and Associated Area
  - ABWF works
  - BS Installation
- M+ Day 2 Works
  - Demolish ex carriageway
  - Conc. duct- Excavate to formation level
  - Conc. duct - form openings in ex structure
- Water Main at Promenade Installation

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 October to 31 October 2020. 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+
  - Timber finishes works
  - Make good
  - T&C (MEP)
  - Landscaping works at 3/F (planting)
  - Cleaning works
- CSF
  - Timber finishes works
  - Make good
  - Landscaping works at G/F (planting)
  - Cleaning works
- RDE
  - MEP installation works
  - T&C
  - ABWF works & make good
  - Hand-over to WKCDA for their onward ABWF works

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 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:

- Visual Mock Up
  - VMU interior work
- LTC construction

  Structure
  - Install and erection tower crane
  - Falsework and Formwork Erection
  - Reinforcement work
  - Concrete work

  BS Installation
- ASDA and Lyric Theatre Promenade
  - Structure works
- Remaining Works for M+ Promenade South
  - Site Clearance

  - Construct concrete slats deck
- DSC Cofferdam
  - Connection of DCS pipes
  - Construction of valve chamber, thrust blocks etc.
  - Back fill and removal of struts
- Modification to Existing Pump Cell
  - Re-provision of Steel Plate Cover
  - ABWF works
- Extended Basement
  - ABWF works
  - BS installation
- Vibration Isolation Spring System Installation
  - Install Remaining Spring
- Underpass and Associated Area
  - ABWF works
  - BS Installation
- M+ Day 2 Works
  - Demolish ex carriageway
  - Conc. duct- Excavate to formation level
  - Conc. duct - form openings in ex structure
- Water Main at Promenade Installation

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

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-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

Parameters	Descriptions	Locations	Frequencies
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

Given that the Project covers only a small part of the whole WKCD area (i.e. M+ Museum, Lyric Theatre Complex and respective portions of underpass road), it was proposed that the EM&A programme for the Project should only require 1 noise monitoring station and 2 air quality monitoring stations located closest to the Project area. Currently, the works under the captioned project are confined in the western part of the WKCD site. Therefore, only the monitoring stations AM1, AM2 and NM1 were set up. Other monitoring locations are too far away (i.e. AM3 to AM5 and NM2 to NM5) are not included in this EM&A programme until the construction of the corresponding area commences.

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. 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. 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. Meanwhile, the opportunity of setting up the air monitoring location at The Harbourside is being explored. Noise monitoring at G/F of Harbourside will not be representative. 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. Therefore, 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
24-hour TSP monitoring	
High Volume Sampler	TE-5170 (Serial No.: 0767 and 8919)
Calibrator	TE-5025A (Orifice I.D.: 2454)
1-hour TSP monitoring	
Portable direct reading dust meter	Sibata LD-3B (Serial No.: 235780 and 6Z7784)

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^3/min. The range specified in the EM&A Manual was between 0.6-1.7 m^3/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 (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. 11334)

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 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

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 (µg/m3)			Range (µg/m3)	Action Level (µg/m3)	Limit Level (µg/m3)
			1st Result	2nd Result	3rd Result			
AM1	05 Oct 20	13:02	32	29	36	29-68	273.7	500
	10 Oct 20	08:22	35	41	48			
	16 Oct 20	13:15	64	59	68			
	22 Oct 20	13:02	36	41	44			
	28 Oct 20	08:20	34	29	36			
AM2B	05 Oct 20	13:16	49	55	56	49-79	274.2	500
	10 Oct 20	08:37	54	62	68			
	16 Oct 20	13:30	64	69	74			
	22 Oct 20	13:16	66	74	70			
	28 Oct 20	08:37	66	75	79			

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 ($\mu g/m^3$)	Range ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
AM1	05 Oct 20	09:00	49	18-49	143.6	260
	10 Oct 20	08:20	32			
	16 Oct 20	08:13	24			
	22 Oct 20	08:20	18			
	28 Oct 20	08:18	27			
AM2B	05 Oct 20	09:14	56	30-85	151.1	260
	10 Oct 20	08:35	30			
	16 Oct 20	08:28	44			
	22 Oct 20	08:34	85			
	28 Oct 20	08:35	80			

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_{eq} (30 mins)*, dB(A)	Limit Level for L_{eq} (dB(A))
05 Oct 20	11:20	11:50	68	75
16 Oct 20	10:38	11:08	68	
22 Oct 20	10:42	11:12	67	
28 Oct 20	10:44	11:14	68	

Remarks:

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

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

3.4 Landscape and Visual Impact

Landscape and visual impact inspections were conducted as part of the weekly site inspections on 12 and 30 October 2020 for M+ Museum, and 7 and 21 October 2020 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 Environmental Site Inspection

4.1 Site Inspection

4.1.1 M+ Museum

Construction phase weekly site inspections were carried out on 5, 12, 19 and 30 October 2020. The joint site inspection with IEC, ET, ER and Contractor was held on 30 October 2020. All observations have been recorded in the site inspection checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary.

EPD site inspection with contractor was conducted on 19 October 2020. No adverse comment was made on the site inspection.

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	Contactor's Responses / Action(s) Undertaken	Close-out (Date)
05-Oct-20	Water Quality	Effluent quality of wetsep was checked. It was found visually clear when compared with standard solution and within proper pH range.	N/A	N/A
12-Oct-20	Water Quality	The contractor was reminded to cover the drain surface properly to prevent silt being washed out into the drainage system.	The contractor has covered the drain surface properly.	12-Oct-20
12-Oct-20	Air Quality	The contractor was reminded to cover the soil with impervious sheeting at the end of the working day.	The contractor has covered the soil with impervious sheeting.	12-Oct-20
12-Oct-20	Water Quality	Effluent quality of wetsep was checked. It was found visually clear when compared with standard solution and within proper pH range.	N/A	N/A
19-Oct-20	Water Quality	Insufficient sandbags were observed around the drain surface. The contractor was reminded to provide enough sandbags to prevent silt being washed out into the drainage system.	The contractor has provided enough sandbags around the drain surface.	19-Oct-20
19-Oct-20	Water Quality	Improper discharge was observed at B1 carriageway. The contractor was reminded to enhance the monitoring.	The concerned hose has removed.	19-Oct-20
19-Oct-20	Water Quality	Effluent quality of wetsep was checked. It was found visually clear when compared with standard solution and within proper pH range.	N/A	N/A

Inspection Date	Parameter	Observation / Recommendation	Contactor's Responses / Action(s) Undertaken	Close-out (Date)
30-Oct-20	Waste Management	The contractor was reminded to dispose of the general refuse regularly at the planting area.	The contractor has cleaned up the general refuse at the planting area.	31-Oct-20
30-Oct-20	Water Quality	Effluent quality of wetsep was checked. It was found visually clear when compared with standard solution and within proper pH range.	N/A	N/A

4.1.2 Lyric Theatre Complex

Construction phase weekly site inspections were carried out on 7, 15, 21 and 28 October 2020 (L1 and L2 Contract). The joint site inspection with IEC, ET, ER and Contractor was held on 21 October 2020. All observations have been recorded in the site inspection checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary.

EPD site inspection with contractor was conducted on 9 October 2020. No adverse comment was made on the site inspection.

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	Contactor's Responses / Action(s) Undertaken	Close-out (Date)
21-Oct-20	Air Quality	The contractor was reminded to increase water spraying frequency to avoid dust impact.	The contractor has increased water spraying frequency.	21-Oct-20

Table 4.3: Summary of Site Inspections and Recommendations for L2

Inspection Date	Parameter	Observation / Recommendation	Contactor's Responses / Action(s) Undertaken	Close-out (Date)
-	-	-	-	-

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, 0.0 tonne, 0.0 tonne, 76.1 tonnes, 0.0 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. 227.3 tonnes of general refuse were disposed of at SENT landfill. 100.0 tonnes of metal, 0.4 tonnes of paper/cardboard packaging, 0.0 tonne of plastic 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 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), 1039.74 tonnes and 341.71 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 400.1 tonnes of general refuse were disposed of at SENT and WENT landfill. 717.9 tonnes of metal, 0.0 tonne of paper/cardboard packaging, 0.0 tonne of plastic 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. / Notification / 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	Valid	--
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. / Notification / Reference No.	Valid Period		Status	Remarks
	From	To		
Chemical Waste Producer Registration				
WPN5213-217-G2347-39	17-Feb-16	--	Valid	--

Permit / License No. / Notification / Reference No.	Valid Period		Status	Remarks
	From	To		
Billing Account Construction Waste Disposal				
7029925	22-Jan-18	--	Account Active	--
Construction Noise Permit				
GW-RE0674-20	10-Aug-20	9-Feb-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. / 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-RE0674-20	10-Aug-20	9-Feb-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

Water Quality

- Drain surface should be covered adequately to prevent silt being washed out into the storm drains.
- Sufficient sandbags should be provided around the drain surface to prevent silt being washed out into the storm drains.
- Drainage plan should be kept reviewing and monitoring all the time.

Air Quality

- Dusty materials should be covered by impervious sheeting.

4.4.2 Lyric Theatre Complex

L1

Air Quality

- Maintain water spraying for active construction area.

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 September 2020	14 October 2020

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 and Noise monitoring in the reporting month.

6.2 Record on Environmental Complaints Received

No environmental complaint was received in the reporting month. 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+
  - Timber finishes works
  - Make good
  - T&C (MEP)
  - Landscaping works at 3/F (planting)
  - Cleaning works
- CSF
  - Make good
  - Cleaning works
  - Hand-over
- RDE
  - MEP installation works
  - T&C, ABWF works & make good
  - G/F paving works

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 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:

- Visual Mock Up
  - VMU interior work
- LTC construction

  Structure
  - Install and erection tower crane
  - Falsework and Formwork Erection
  - Reinforcement work
  - Concrete work

  BS Installation

- ASDA and Lyric Theatre Promenade
  - Structure works
- Remaining Works for M+ Promenade South
  - Site Clearance
  - Construct concrete slats deck
- DSC Cofferdam
  - Connection of DCS pipes
  - Construction of valve chamber, thrust blocks etc.
  - Back fill and removal of struts
- Modification to Existing Pump Cell
  - ABWF works
- Extended Basement
  - AWBF works
  - BS installation
- Vibration Isolation Spring System Installation
  - Install Remaining Spring
- Underpass and Associated Area
  - ABWF works
  - BS Installation
- M+ Day 2 Works
  - Demolish ex carriageway
  - Conc. duct- Excavate to formation level
  - Conc. duct - form openings in ex structure
- Water Main at Promenade Installation

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 and noise in the reporting month.

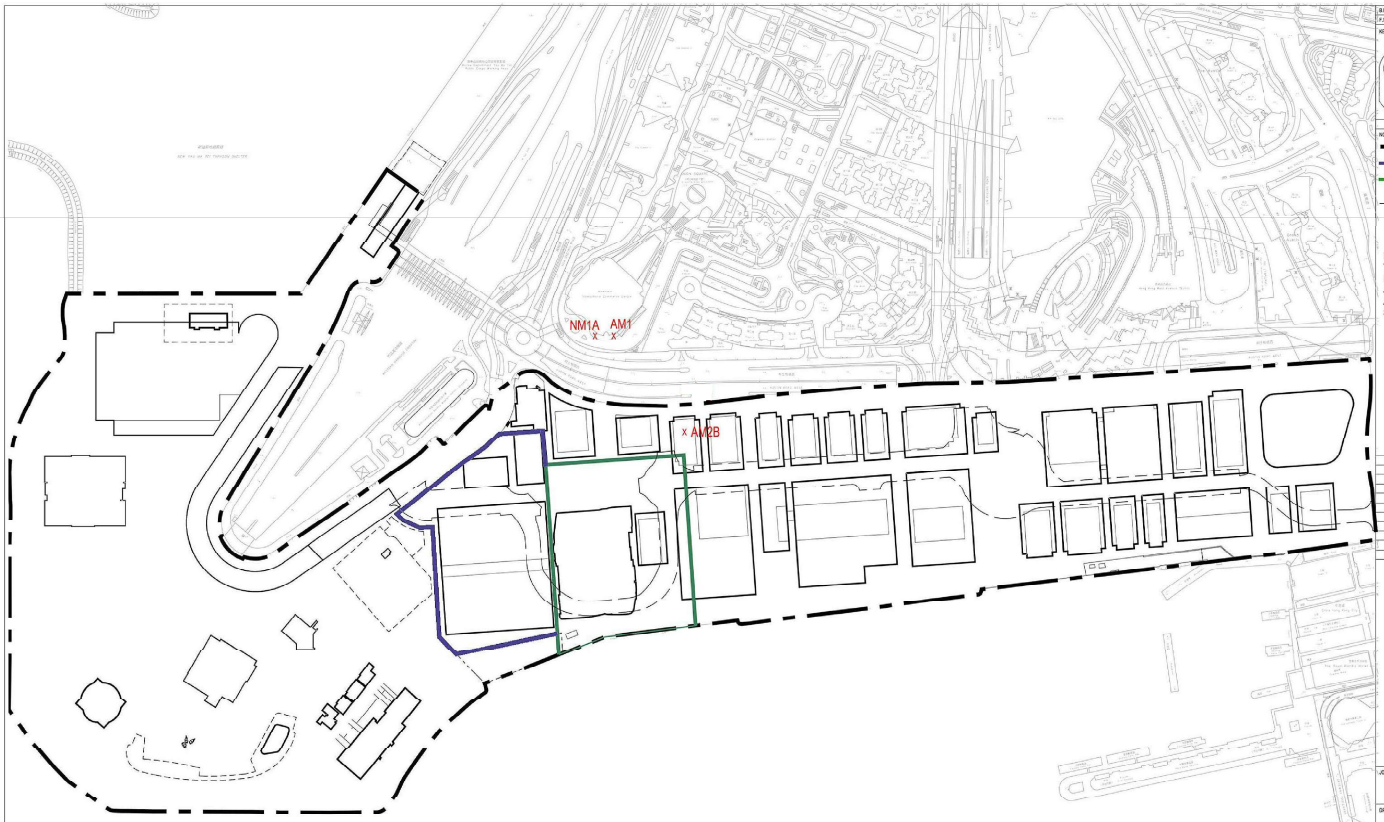
No environmental complaint was recorded in the reporting month. No notifications of summons or successful prosecutions were received during the reporting month.

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

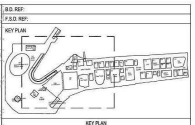
Potential environmental impacts due to the construction activities, including air quality, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried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

Figure 1 Site Layout Plan and Monitoring Stations



B.D. REF:
F.S.D. REF:

KEY PLAN



KEY PLAN

NOTES:

WKCD BOUNDARY
M+ MUSEUM BOUNDARY
LYRIC THEATRE BOUNDARY
BOUNDARY OF UNDERPASS ROAD SERVING THE PLANNED WKCD
X CONSTRUCTION AIR/NOISE MONITORING STATION

REMARKS:
THE AIR MONITORING STATION AM2A HAS BEEN RELOCATED TO THE ALTERNATIVE MONITORING STATION AM2B AT 1ST FLOOR OF GAMMON'S SITE OFFICE ON 26 FEBRUARY 2019.

REV.	DATE	DESCRIPTION	INITIAL

JOB TITLE: DEVELOPMENT AT WEST KOWLOON CULTURAL DISTRICT

DRAWING TITLE: SITE LAYOUT PLAN AND MONITORING STATIONS

SCALE	1:100	PRINTED	A1
CHECKED		DATE	
APPROVED		DATE	
DRAWN	TY	DATE	16-10-2018

CONTRACT NO. -

DRAWING NO. FIGURE 1 — REV. XA

CAD REF NAME: XXXXX-K2F-PWS-DWG-PSS-LCD-0003-XXX.dwg

AUTHORITY

westKowloon
西九文化區

A1 (841mm x 594mm) Sheet Size

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

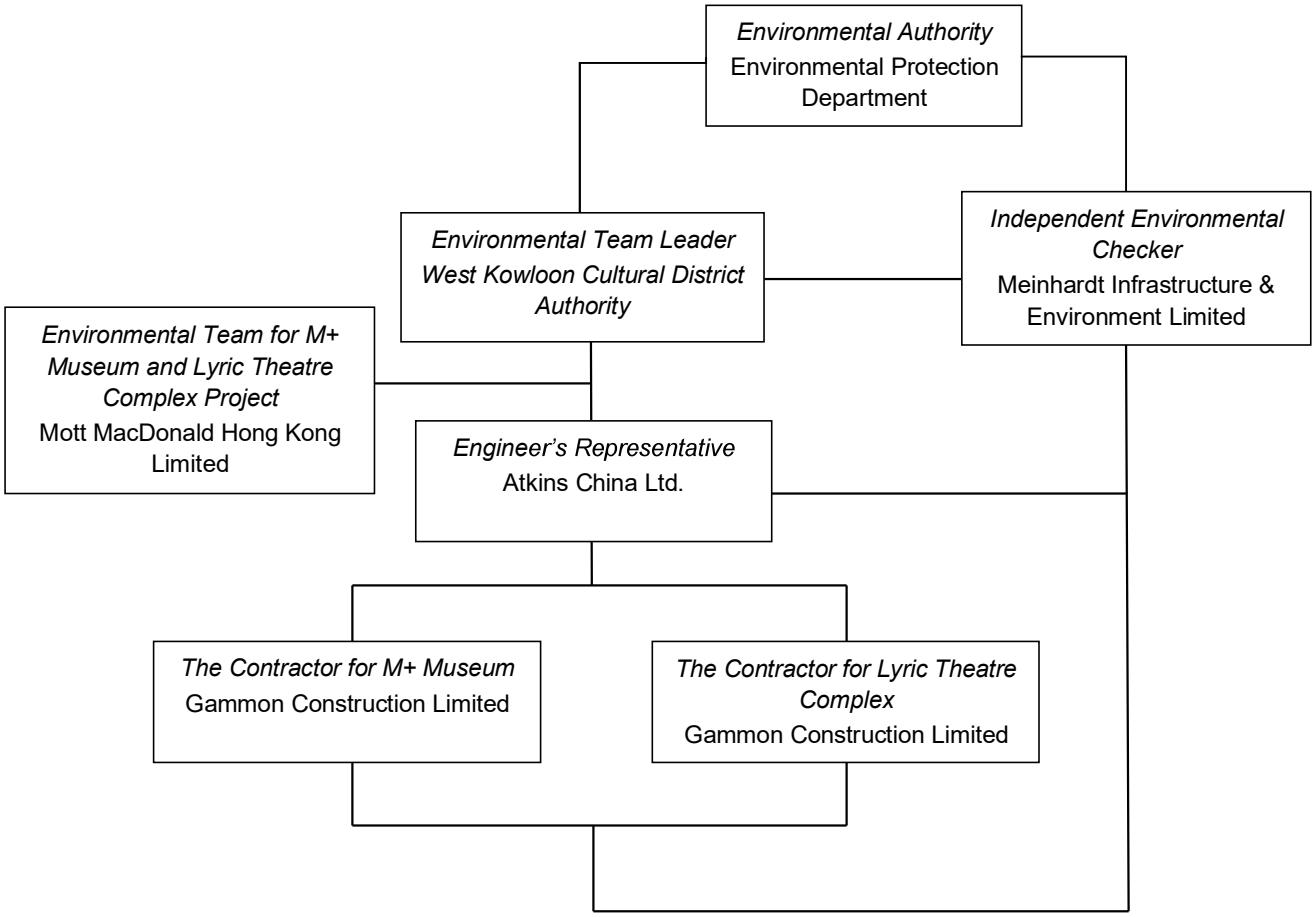


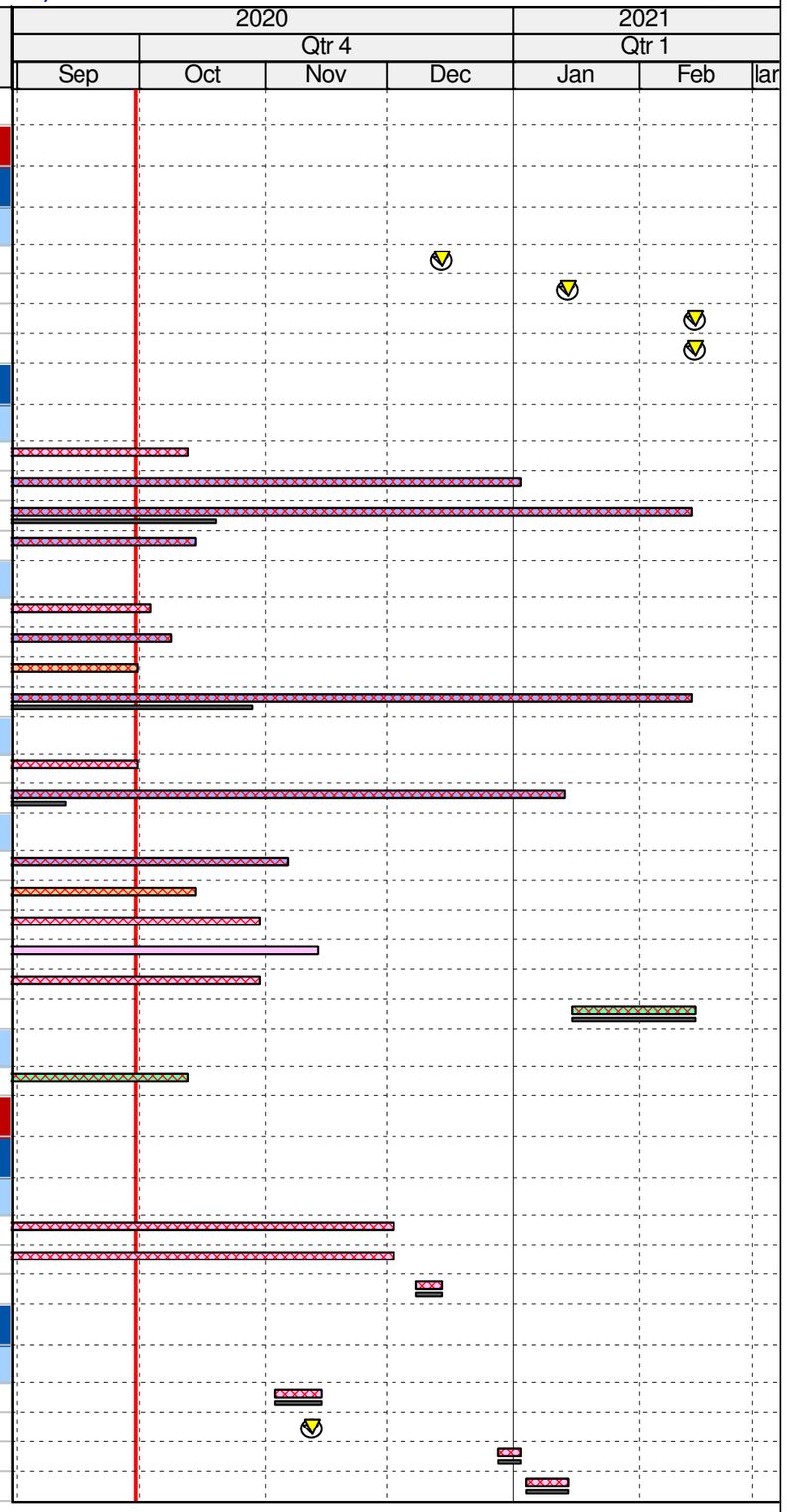
Table A-1: Contact information

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	WKCDA Representative & Project ETL	Mr. C.K. Wu	5506 9178	ck.wu@wkcda.hk

B. Tentative Construction Programme

M+ Museum

ID	Activity	RD	BL Start	BL Finish	F'cast / Actual Start	F'cast / Actual Finish	BL Finish Var	TF
CMWP - M+ Project Remaining Works @ 10 Sep 2018 Approved Target CMWP (Rev_0_20 UPD_DD_30 Sep 20)								
GENERAL & PRELIMINARIES (Remaining Works @ 10 SEP 2018)								
PROJECT KEY COMPLETION DATES								
Completion Obligations (*constrained dates for critical paths)								
OP1	Podium, M+ Tower & CSF - Obtain OP for the Whole of M+	0		14-Dec-20		14-Dec-20*	0	-257
OP2	RDE - Obtain OP for H'over to Employer	0		14-Jan-21		14-Jan-21*	0	-229
PC1	Podium, M+ Tower - Obtain PC for H'over to Employer	0		14-Feb-21		14-Feb-21*	0	-229
PC2	RDE - Obtain PC for H'over to Employer	0		14-Feb-21		14-Feb-21*	0	-229
LEVEL 1 SUMMARY CONSTRUCTION PROGRAM								
Basement & Podium								
1769	[LoE] POD - MEP Works to Completion of Final Terminations	9	01-Apr-19	05-May-20	11-Oct-18 A	12-Oct-20	-134	-86
1766	[LoE] POD - ABWF Works (Excl. Timber Finishes & Post DP & OP works)	78	15-Nov-19	11-Jun-20	15-Apr-19 A	02-Jan-21	-170	-210
1768	[LoE] POD - ABWF (Timber Finishes and other Post DP and OP Works)	114	09-Apr-20	19-Oct-20	09-Mar-20 A	13-Feb-21	-99	-172
1767	[LoE] POD - Drying Period	11	04-May-20	02-Jul-20	18-Apr-20 A	14-Oct-20	-87	-152
M+ Tower								
9793	[LoE] TW - MEP Works to Completion of Final Terminations	2	13-Apr-19	04-Dec-19	15-Oct-18 A	03-Oct-20	-246	-168
9790	[LoE] TW - ABWF Works (Excl. Timber Finishes & Post DP & OP works)	6	23-Mar-19	18-Jan-20	30-Oct-18 A	08-Oct-20	-213	-168
9834	[LoE] TW - Shop Front Glazing Podium L3 to M+ Tower 4/F Slab	0	01-Jun-19	02-Sep-19	27-May-19 A	30-Sep-20	-321	-209
9792	[LoE] TW - ABWF (Timber Finishes and other Post DP and OP Works)	114	05-May-20	28-Oct-20	20-Apr-20 A	13-Feb-21	-92	-117
CSF Building								
9828	[LoE] CSF - MEP Works to Completion of Final Terminations	0	02-May-19	08-Nov-19	08-Apr-19 A	30-Sep-20	-266	-209
111129	[LoE] CSF - ABWF Works (Timber Finishes & other Post OP Works)	87	01-Jun-20	12-Sep-20	14-May-20 A	13-Jan-21	-101	-80
RDE Tower								
9839	[LoE] RDE - ABWF Works	30	29-Mar-19	06-Apr-20	10-Nov-18 A	06-Nov-20	-178	-146
9838	[LoE] RDE - EWS Facade Works to Weather Tight Stage (incl. Roof & UF)	11	29-Mar-19	31-Dec-19	27-Dec-18 A	14-Oct-20	-233	-175
9836	[LoE] RDE - MEP Works to Completion of Final Terminations (L4 to 15MF)	24	01-Mar-19	30-Mar-20	07-Jan-19 A	30-Oct-20	-177	-139
9840	[LoE] RDE - MC's T&C for FSD Inspection	36	04-Mar-20	26-May-20	21-Nov-19 A	13-Nov-20	-142	78
9841	[LoE] RDE - MEP Works @ 15MF (BoH Plant Rooms)	24	21-Mar-20	18-Jun-20	22-Feb-20 A	30-Oct-20	-110	-140
9794	[LoE] RDE - Post OP Miscellaneous Works	31	15-Jan-21	14-Feb-21	15-Jan-21	14-Feb-21	0	-229
External Works								
9814	[LoE] EXT - Along Building Boundaries	9	01-Mar-19	06-Apr-20	20-Oct-18 A	12-Oct-20	-157	-152
COMPLETION STATUTORY INSPECTIONS & APPROVALS								
Basement, Podium, M+ Tower & CSF Building								
FSD & BD								
FSD2	FSD - FSD MAIN Inspection/Re-Inspection/Remedial Works - BASEMENT	48	17-Jun-20	14-Aug-20	21-May-20 A	02-Dec-20	-91	-213
FSD2b	FSD - FSD MAIN Inspection/Re-Inspection/Remedial Works - M+ TOWER	6	21-May-20	18-Jul-20	21-May-20 A	02-Dec-20	-114	-213
1189	BD - Obtain OP for Basement/Podium/M+/CSF	6	08-Dec-20	14-Dec-20	08-Dec-20	14-Dec-20	0	-213
RDE Building								
FSD & BD								
RDE_FSD	RDE_FSD - FSD Inspection/Re-Inspection/Remedial Works (layouts & syst	11	03-Nov-20	14-Nov-20	03-Nov-20	14-Nov-20	0	-146
7484	RDE_FSD - Submit Form 314 & Form 501	0		12-Nov-20		12-Nov-20*	0	-155
RDE_BD	RDE_BD - Inspection/Re-Inspection	6	28-Dec-20	02-Jan-21	28-Dec-20	02-Jan-21	0	-190
7490	RDE_BD - Obtain OP for RDE	10	04-Jan-21	14-Jan-21	04-Jan-21	14-Jan-21	0	-190



Gammon

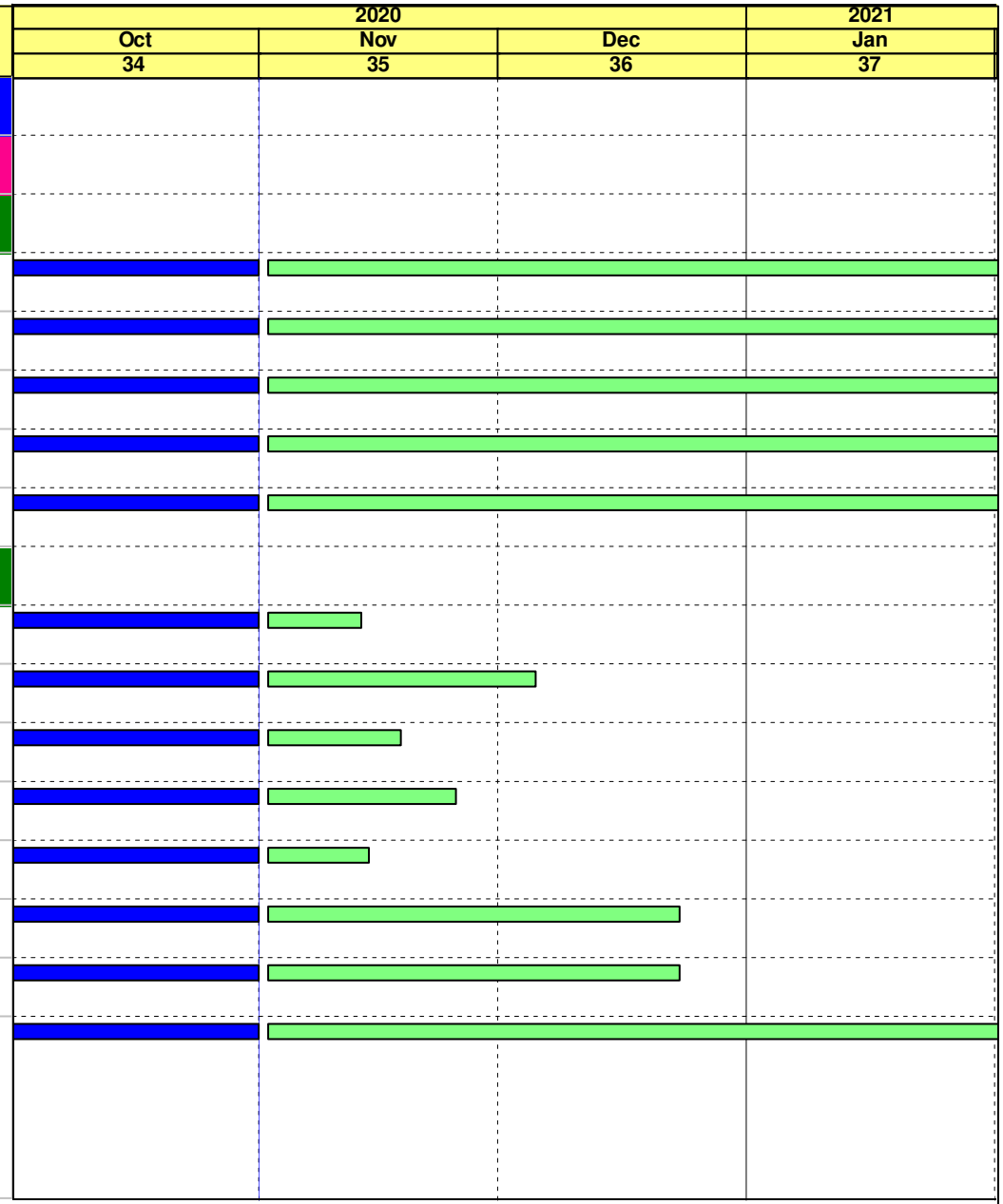
Base Line MS | Milestone | Current - Other Works | Current - Struct Works | Current - MEP Works | Current - ABWF Works | Current - Faca... | Critical Works | Base Line ACT

CMWP Rev. 0_20 - Level 1 Summary Bar Chart (20th Update DD: 30Sep20)

Date	Revision	Checked	Approved
01-Feb-19	CMWP Rev. 0 - Approved Master Programme	NS	BG
10-Oct-20	CMWP Rev.0_20 - 20th Update (dd: 30 Sep 20)	AB	BG

L1

Activity ID	Activity Name	Start Date	Finish Date
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	27-Feb-21
SU11000	South Basement - South / West Area	14-Dec-19 A	10-Feb-21
SU12000	South Basement - East Area	27-Feb-20 A	04-Mar-21
SU13000	North Basement - North Area	12-Jun-19 A	30-Mar-21
SU14000	North Basement - Area 6	01-Jun-19 A	02-Mar-21
Cost Centre C3 - AET Protection			
SU20000	Wall Beam WF	27-Mar-20 A	13-Nov-20
SU21000	Wall Beam WE	08-Jun-20 A	05-Dec-20
SU22000	Wall Beam W2	18-Apr-20 A	18-Nov-20
SU23000	Wall Beam W1	18-Apr-20 A	25-Nov-20
SU24000	Wall Beam WB	18-May-20 A	14-Nov-20
SU25000	Wall Beam WC	06-May-20 A	23-Dec-20
SU26000	Wall Beam WD	23-May-20 A	23-Dec-20
SU27000	Structure between Wall Beam	19-Aug-20 A	17-Feb-21



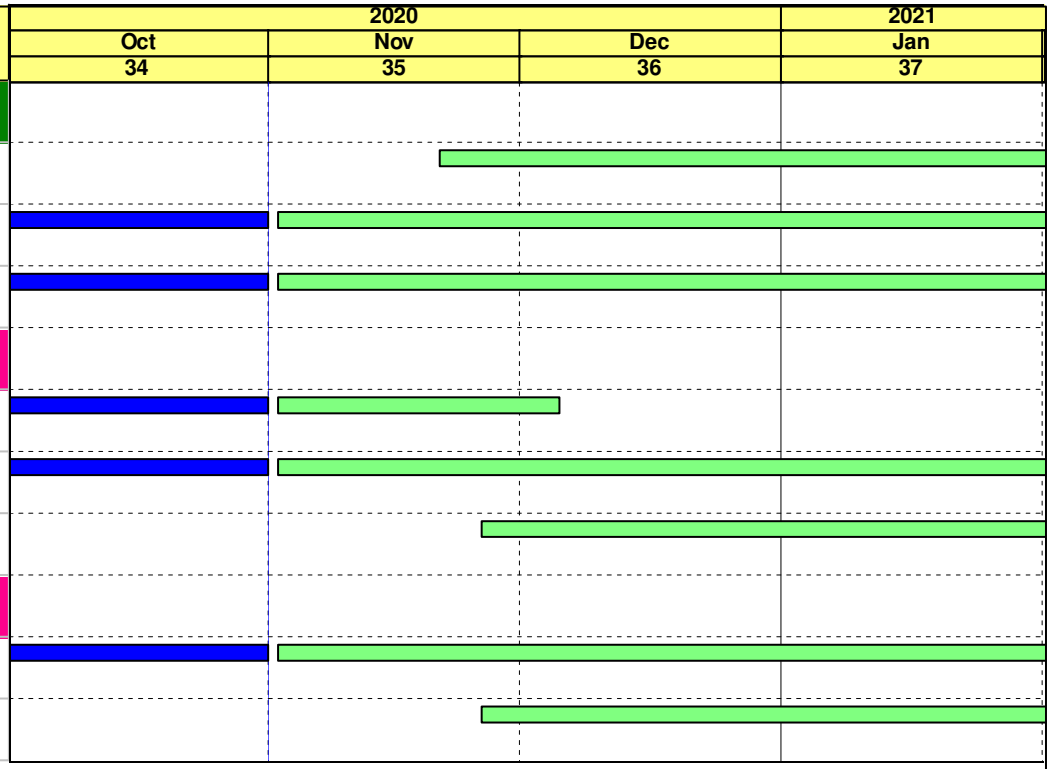
Remaining Work
Critical Remaining Work
Actual Work
Milestone

Project ID: L13MRP-20201031-ENV
Layout: L1-3MRP (Env)
Page: 1 of 2

West Kowloon Cultural District Authority
L1 Contract for Lyric Theatre Complex & Extended Basement
Three Month Rolling Programme (3MRP) - Status as of 31 Oct 2020

Gammon

Activity ID	Activity Name	Start Date	Finish Date
Cost Centre C4 - Box Culvert			
SU30000	South Section	21-Nov-20*	19-Feb-21
SU31000	North Section	22-Jun-20 A	17-Feb-21
SU32000	Austin Road	29-Jun-20 A	31-Jul-21
Cost Centre D - Public Infrastructure Works (PIW)			
SU40000	Drainage Works	20-Mar-18 A	05-Dec-20
SU41000	Utilities & Road Works	04-Oct-18 A	01-Apr-21
SU42000	Box Culvert Outfall	26-Nov-20	31-Aug-21
Cost Centre E - Miscellaneous Works			
SU50000	Drainage & Sewerage Works	19-Nov-19 A	27-May-21
SU52000	DCS Outfall	26-Nov-20	31-Aug-21



Remaining Work
Critical Remaining Work
Actual Work
Milestone

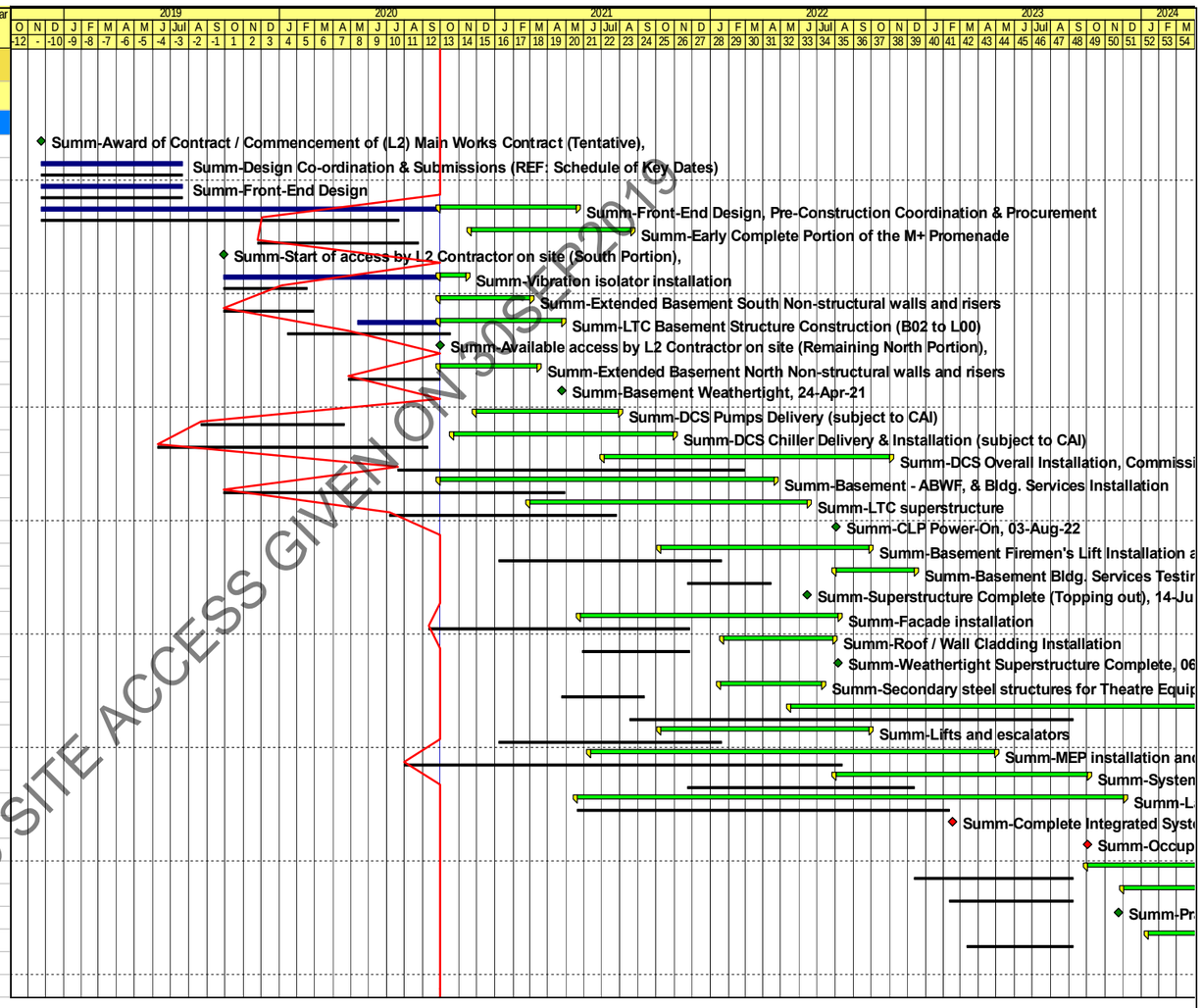
Project ID: L13MRP-20201031-ENV
Layout: L1-3MRP (Env)
Page: 2 of 2

West Kowloon Cultural District Authority
L1 Contract for Lyric Theatre Complex & Extended Basement
Three Month Rolling Programme (3MRP) - Status as of 31 Oct 2020

Gammon

L2

Activity ID	Activity Name	Planned Dur	Planned Start	Planned Finish	Forecast / Actual Start	Forecast / Actual Finish	Activity % Complete	Finish Variance	Total Float	Calendar
L2-CSWP 2020-09-30										
GENERAL										
Works Package L2 Summary Programme										
L210100	Summ-Award of Contract / Commencement of (L2) Main Work	0	23-Nov-18		23-Nov-18 A		100%	0		G1
L210110	Summ-Design Co-ordination & Submissions (REF: Schedule (	240	23-Nov-18	20-Jul-19	23-Nov-18 A	20-Jul-19 A	100%	0		G1
L210120	Summ-Front-End Design	240	23-Nov-18	20-Jul-19	23-Nov-18 A	20-Jul-19 A	100%	0		G1
L210130	Summ-Front-End Design, Pre-Construction Coordination & Pr	607	23-Nov-18	21-Jul-20	23-Nov-18 A	18-May-21	61.94%	-301	-176	G1
L210140	Summ-Early Complete Portion of the M+ Promenade	274	25-Nov-19	24-Aug-20	21-Nov-20	19-Aug-21	0%	-360	-360	G1
L210150	Summ-Start of access by L2 Contractor on site (South Portior	0	30-Sep-19		30-Sep-19 A		100%	0		G1
L210160	Summ-Vibration isolator installation	141	30-Sep-19	17-Feb-20	30-Sep-19 A	12-Nov-20	68.79%	-269	-267	G1
L210170	Summ-Extended Basement South Non-structural walls and ris	151	30-Sep-19	27-Feb-20	30-Sep-20	01-Mar-21	0%	-368	-366	G1
L210180	Summ-LTC Basement Structure Construction (B02 to L00)	276	16-Jan-20	17-Oct-20	13-May-20 A	24-Apr-21	37.08%	-189	-193	G1
L210190	Summ-Available access by L2 Contractor on site (Remaining	0	27-Apr-20		30-Sep-20		0%	-156	1439	G1
L210200	Summ-Extended Basement North Non-structural walls and ris	156	27-Apr-20	29-Sep-20	30-Sep-20	13-Mar-21	0%	-165	-164	G1
L210210	Summ-Basement Weathertight	0		17-Oct-20		24-Apr-21	0%	-189	1232	G1
L210220	Summ-DCS Pumps Delivery (subject to CAI)	244	21-Aug-19	20-Apr-20	01-Dec-20	30-Jul-21	0%	-465	-108	G1
L210230	Summ-DCS Chiller Delivery & Installation (subject to CAI)	457	10-Jun-19	08-Sep-20	23-Oct-20	30-Oct-21	0%	-417	-208	G1
L210240	Summ-DCS Overall Installation, Commissioning, and Integrat	589	20-Jul-20	28-Feb-22	05-Jul-21	31-Oct-22	0%	-245	-184	G1
L210250	Summ-Basement - ABWF, & Bldg. Services Installation	579	30-Sep-19	30-Apr-21	30-Sep-20	19-Apr-22	0%	-354	-291	G1
L210260	Summ-LTC superstructure	386	06-Jul-20	26-Jul-21	02-Mar-21	14-Jun-22	0%	-323	-299	G1
L210270	Summ-CLP Power-On	0		22-Nov-21		03-Aug-22	0%	-253	767	G1
L210280	Summ-Basement Firemen's Lift Installation and Testing	378	08-Jan-21	20-Jan-22	10-Oct-21	27-Sep-22	0%	-250	-171	G1
L210290	Summ-Basement Bldg. Services Testing and Commissioning	142	23-Nov-21	13-Apr-22	03-Aug-22	13-Dec-22	0%	-244	-248	G1
L210300	Summ-Superstructure Complete (Topping out)	0		26-Jul-21		14-Jun-22	0%	-323	816	G1
L210310	Summ-Facade installation	443	11-Sep-20	27-Nov-21	26-May-21	06-Aug-22	0%	-252	-218	G1
L210320	Summ-Roof / Wall Cladding Installation	183	29-May-21	27-Nov-21	24-Jan-22	28-Jul-22	0%	-243	-210	G1
L210330	Summ-Weathertight Superstructure Complete	0		27-Nov-21		06-Aug-22	0%	-252	763	G1
L210340	Summ-Secondary steel structures for Theatre Equipment inst	141	24-Apr-21	11-Sep-21	18-Jan-22	09-Jul-22	0%	-301	-191	G1
L210350	Summ-Theatre Equipment Installation, Fit-Out, and FFE	753	17-Aug-21	08-Sep-23	17-May-22	10-Jul-24	0%	-306	-306	G1
L210360	Summ-Lifts and escalators	378	08-Jan-21	20-Jan-22	09-Oct-21	27-Sep-22	0%	-250	-204	G1
L210370	Summ-MEP installation and ABWF	743	31-Jul-20	12-Aug-22	12-Jun-21	28-Apr-23	0%	-259	-230	G1
L210380	Summ-System Tests and Statutory Inspection	385	23-Nov-21	12-Dec-22	03-Aug-22	03-Oct-23	0%	-295	-299	G1
L210390	Summ-Landscaping Works at Avenue Level	632	20-May-21	10-Feb-23	20-May-21	02-Dec-23	0%	-295	-295	G1
L210400	Summ-Complete Integrated System T&C	0		27-Apr-22		16-Feb-23*	0%	-295	-295	G1
L210410	Summ-Occupation Permit for LTC & EB	0		12-Dec-22		03-Oct-23*	0%	-295	-295	G1
L210420	Summ-Post OP Works	270	13-Dec-22	08-Sep-23	03-Oct-23	10-Jul-24	0%	-306	-306	G1
L210430	Summ-Tenant Fit-Out (RDE, Dance Company, etc.)	210	11-Feb-23	08-Sep-23	02-Dec-23	10-Jul-24	0%	-306	-306	G1
L210440	Summ-Practical Completion--EB and Promenade	0		10-Feb-23		23-Nov-23	0%	-286	289	G1
L210450	Summ-PPE License	180	13-Mar-23	08-Sep-23	13-Jan-24	10-Jul-24	0%	-306	-306	G1
L210460	Summ-Practical Completion--LTC	0		08-Sep-23		10-Jul-24	0%	-306	59	G1
L210470	Summ-Commencement of Post-Handover Services	0		08-Sep-23		10-Jul-24	0%	-306	59	G1



Gammon

L2 CONTRACT FOR LYRIC THEATRE COMPLEX AND EXTENDED BASEMENT PROJECT FOR THE WEST KOWLOON CULTURAL DISTRICT

PROGRAMME UPDATE OF CSWP REV 0 - AS OF 30-Sep-20 (Page 1 of 1)

Date	Revision	Checked	Approved
30-Sep-20	CSWP Update	JL / DP	BC

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^3)	Limit Level (mg/m^3)
AM1	273.7	500
AM2B	274.2	500

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

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

Event	Action			
2. Exceedance for two or more consecutive samples	1. Notify IEC, WKCDA, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and WKCDA to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the WKCDA 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	WKCDA	Contractor
Action Level	1. Notify WKCDA, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, WKCDA and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the WKCDA accordingly; 3. Advise the WKCDA on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures.	1. Submit noise mitigation proposals to IEC and WKCDA; 2. Implement noise mitigation proposals.
Limit Level	1. Inform IEC, WKCDA, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and WKCDA on remedial measures required; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 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; 2. Submit proposals for remedial actions to IEC and WKCDA within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; 5. Stop the relevant portion of works as instructed by the WKCDA 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			
	ET	IEC	WKCDA	Contractor
Design Check	1. Design check to make sure the design complies with all the proposed mitigation measures in the EIA report; 2. Prepare and submit report.	1. Check report submitted by ET; 2. Recommend remedial design if necessary.	1. Undertake remedial design if necessary.	-
Non-conformity on one occasion	1. Identify source of non-conformity; 2. Report to IEC and WKCDA; 3. Discuss remedial actions with IEC, WKCDA and Contractor; 4. Monitor remedial actions until rectification has been completed.	1. Check and verify source of non-conformity; 2. Discuss remedial actions with ET and Contractor; 3. Advise WKCDA on effectiveness of proposed remedial actions; 4. Check implementation of remedial actions.	1. Notify Contractor; 2. Ensure remedial actions are properly implemented.	1. Amend working method as necessary; 2. Rectify damage and undertake necessary replacement and remedial actions.
Repeated non-conformity	1. Identify source of non-conformity; 2. Report to IEC and WKCDA; 3. Increase monitoring frequency; 4. Discuss remedial actions with IEC, WKCDA and Contractor; 5. Monitor remedial actions until rectification has been completed; 6. If non-conformity rectified, reduce monitoring frequency back to normal.	1. Check and verify source of non-conformity; 2. Check Contractor's working method; 3. Discuss remedial actions with ET and Contractor; 4. Advise WKCDA on effectiveness of proposed remedial actions; 5. Supervise implementation of remedial actions.	1. Notify Contractor; 2. Ensure remedial actions are properly implemented.	1. Amend working method as necessary; 2. Rectify damage and undertake necessary replacement and remedial actions.

E. Monitoring Schedule

OCTOBER 2020

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

NOVEMBER 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3 AM1, AM2B - 24hrTSP, 1hr TSP x3 NM1A - Noise Impact Monitoring	4	5	6	7
8	9 AM1, AM2B - 24hrTSP, 1hr TSP x3 NM1A - Noise Impact Monitoring	10	11	12	13	14 AM1, AM2B - 24hrTSP, 1hr TSP x3
15	16	17	18	19	20 AM1, AM2B - 24hrTSP, 1hr TSP x3 NM1A - Noise Impact Monitoring	21
22	23	24	25	26 AM1, AM2B - 24hrTSP, 1hr TSP x3 NM1A - Noise Impact Monitoring	27	28
29	30					
		Notes: **AM1 - International Commerce Centre (ICC)** **AM2B - 1st Floor of Gammon's Site Office** **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	:	20/09/2020

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)	:	1009
Ta(K)	:	303

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	10.2	3.161	1.546	60	59.39
2	13 holes	7.6	2.729	1.337	50	49.49
3	10 holes	6.0	2.424	1.190	40	39.59
4	7 holes	4.0	1.980	0.975	28	27.71
5	5 holes	2.6	1.596	0.790	18	17.82

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

Sampler Calibration Relationship (Linear Regression)

Slope(m):55.925 Intercept(b):-26.508 Correlation Coefficient(r): 0.9991

Checked by: Magnum Fan Date: 26/09/2020

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AM2B(Gammon Office)
Calibrated by	:	K. T. Ho
Date	:	20/09/2020

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)	:	1009
Ta(K)	:	303

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	12.6	3.513	1.716	62	61.36
2	13 holes	8.2	2.834	1.388	50	49.49
3	10 holes	5.8	2.384	1.171	38	37.61
4	7 holes	3.4	1.825	0.901	28	27.71
5	5 holes	2.2	1.468	0.728	18	17.82

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

Sampler Calibration Relationship (Linear Regression)

Slope(m):43.924 Intercept(b):-13.006 Correlation Coefficient(r): 0.9972

Checked by: Magnum Fan Date: 26/09/2020

TISCH Environmental

RECALIBRATION DUE DATE:
February 18, 2021

Certificate of Calibration

Calibration Certification Information

Cal. Date: February 18, 2020 Rootsmeter S/N: 438320 Ta: 294 °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	3.2	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)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (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= $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

Qa= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg

Key

ΔH: calibrator manometer reading (in H2O)

ΔP: rootsmeter manometer reading (mm Hg)

Ta: actual absolute temperature (°K)

Pa: actual barometric pressure (mm Hg)

b: intercept

m: slope

RECALIBRATION

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: MR K.W. FAN	WORK ORDER	: **HK1950885**
CLIENT	: ENVIROTECH SERVICES CO.		
ADDRESS	: RM113, 1/F, MY LOFT, 9 HOI WING ROAD, TUEN MUN, N.T. HONG KONG	SUB-BATCH	: 1
		DATE RECEIVED	: 3-DEC-2019
		DATE OF ISSUE	: 13-DEC-2019
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.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd
Part of the ALS Laboratory Group
11/F, Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
Tel. +852 2610 1044 Fax. +852 2610 2021 www.alsglobal.com

WORK ORDER : HK1950885
SUB-BATCH : 1
CLIENT : ENVIROTECH SERVICES CO.
PROJECT : ----

ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1950885-001	S/N: 235780	Equipments	03-Dec-2019	235780

Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	235780
Equipment Ref:	Nil
Job Order	HK1950885

Standard Equipment:

Standard Equipment:	Higher Volume Sampler (TSP)
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	3 December 2019

Equipment Verification Results:

Verification Date: 10 December 2019

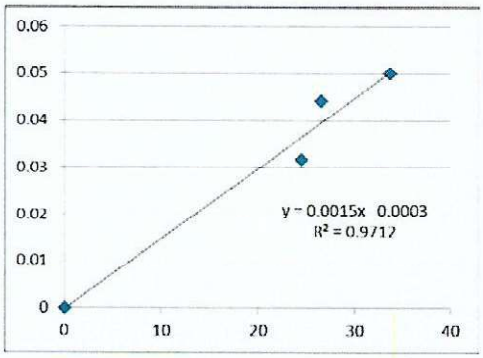
Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/min)
2hr02min	09:08 ~ 11:10	18.4	1018.6	0.032	2989	24.5
2hr01min	11:15 ~ 13:16	18.4	1018.6	0.044	3203	26.6
2hr01min	13:22 ~ 15:23	18.4	1018.6	0.050	4060	33.7

Linear Regression of Y or X

Slope (K-factor): 0.0015

Correlation Coefficient 0.9855

Date of Issue 13 December 2019



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0015 should be applied for TSP monitoring

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

Operator : Fai So Signature : Date : 13 December 2019

QC Reviewer : Ben Tam Signature : Date : 13 December 2019

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: MR K.W. FAN	WORK ORDER	: **HK1950891**
CLIENT	: **ENVIROTECH SERVICES CO.**		
ADDRESS	: RM113, 1/F, MY LOFT, 9 HOI WING ROAD, TUEN MUN, N.T. HONG KONG	SUB-BATCH	: 1
		DATE RECEIVED	: 3-DEC-2019
		DATE OF ISSUE	: 13-DEC-2019
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.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd
Part of the ALS Laboratory Group
11/F. Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
Tel. +852 2610 1044 Fax. +852 2610 2021 www.alsglobal.com

WORK ORDER : HK1950891
SUB-BATCH : 1
CLIENT : ENVIROTECH SERVICES CO.
PROJECT : ----

ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1950891-001	S/N: 6Z7784	Equipments	03-Dec-2019	6Z7784

Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	6Z7784
Equipment Ref:	Nil
Job Order	HK1950891

Standard Equipment:

Standard Equipment:	Higher Volume Sampler (TSP)
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	3 December 2019

Equipment Verification Results:

Verification Date: 10 December 2019

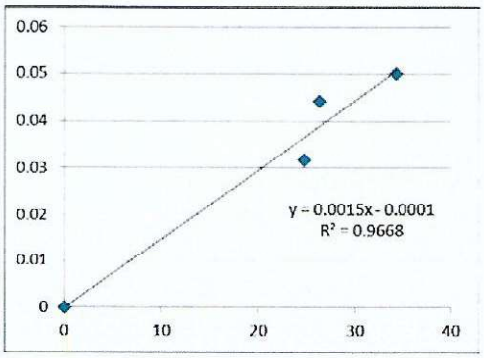
Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/min)
2hr02min	09:08 ~ 11:10	18.4	1018.6	0.032	3020	24.8
2hr01min	11:15 ~ 13:16	18.4	1018.6	0.044	3185	26.4
2hr01min	13:22 ~ 15:23	18.4	1018.6	0.050	4141	34.3

Linear Regression of Y or X

Slope (K-factor): 0.0015

Correlation Coefficient 0.9833

Date of Issue 13 December 2019



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0015 should be applied for TSP monitoring

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

Operator : Fai So Signature : Date : 13 December 2019

QC Reviewer : Ben Tam Signature : Date : 13 December 2019

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 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 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 : Cheuk
K P Cheuk
Assistant Engineer

Certified By 核證 :
K C Lee
Engineer

Date of Issue 簽發日期 : 10 July 2020

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 – 校正及檢測實驗所
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

1. 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.

2. Self-calibration was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

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

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

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

6.1.2 Linearity

UUT Setting				Applied Value		UUT
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)
30 - 130	L_A	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	IEC 61672
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Class 1 Spec. (dB)
30 - 130	L_A	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_A	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_C	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)

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

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	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 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.

Sun Creation Engineering Limited Calibration & Testing 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. : C196453
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC19-2418) Date of Receipt / 收件日期 : 18 November 2019

Description / 儀器名稱	:	Precision Acoustic Calibrator
Manufacturer / 製造商	:	LARSON DAVIS
Model No. / 型號	:	CAL200
Serial No. / 編號	:	11334
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 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 30 November 2019

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification & user's specified acceptance criteria.
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, Technical Officer

Certified By 核證 : K C Lee, Engineer

Date of Issue 簽發日期 : 3 December 2019

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 — 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
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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. : C196453
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 :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C193756
CL281	Multifunction Acoustic Calibrator	CDK1806821
TST150A	Measuring Amplifier	C181288

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	User's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	93.8	± 0.5	± 0.2
114 dB, 1 kHz	113.7		

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.000	1 kHz ± 1 %	± 1

Remarks : - The user's specified acceptance criteria (user's spec.) is a customer pre-defined operating tolerance of the UUT, suitable for one's own intended use.

- 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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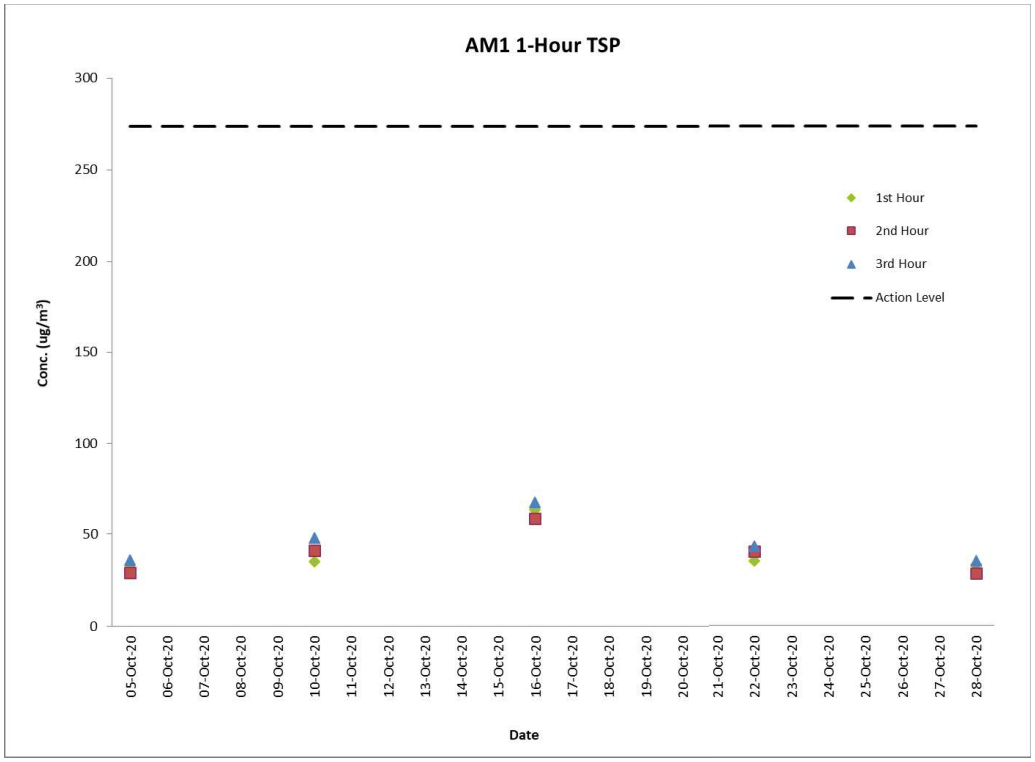
G. Graphical Plots of the Monitoring Results

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

Date	Weather Condition	Time	Conc. (μg/m^3)			Action Level (μg/m^3)	Limit Level (μg/m^3)
			1st Hour	2nd Hour	3rd Hour		
05-Oct-20	Cloudy	13:02 - 16:02	32	29	36	273.7	500
10-Oct-20	Sunny	8:22 - 11:22	35	41	48	273.7	500
16-Oct-20	Sunny	13:15 - 16:15	64	59	68	273.7	500
22-Oct-20	Fine	13:02 - 16:02	36	41	44	273.7	500
28-Oct-20	Cloudy	8:20 - 11:20	34	29	36	273.7	500

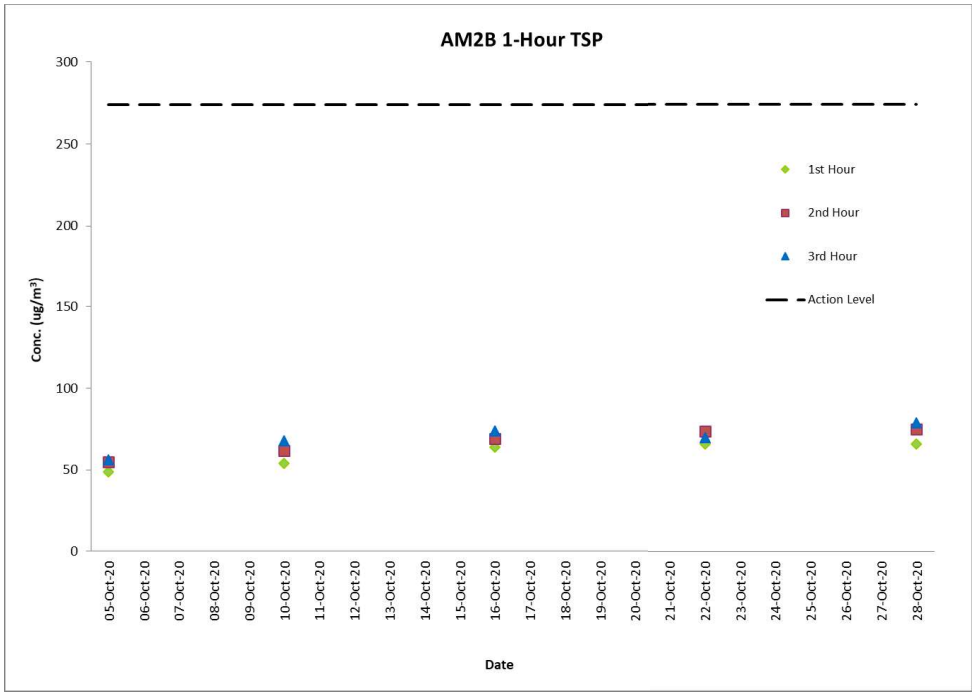
Graphical Presentation of Air Quality Monitoring Result at Station AM1 (1-hour TSP)



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

Date	Weather Condition	Time	Conc. (μg/m^3)			Action Level (μg/m^3)	Limit Level (μg/m^3)
			1st Hour	2nd Hour	3rd Hour		
05-Oct-20	Cloudy	13:16 - 16:16	49	55	56	274.2	500
10-Oct-20	Sunny	8:37 - 11:37	54	62	68	274.2	500
16-Oct-20	Sunny	13:30 - 16:30	64	69	74	274.2	500
22-Oct-20	Fine	13:16 - 16:16	66	74	70	274.2	500
28-Oct-20	Cloudy	8:37 - 11:37	66	75	79	274.2	500

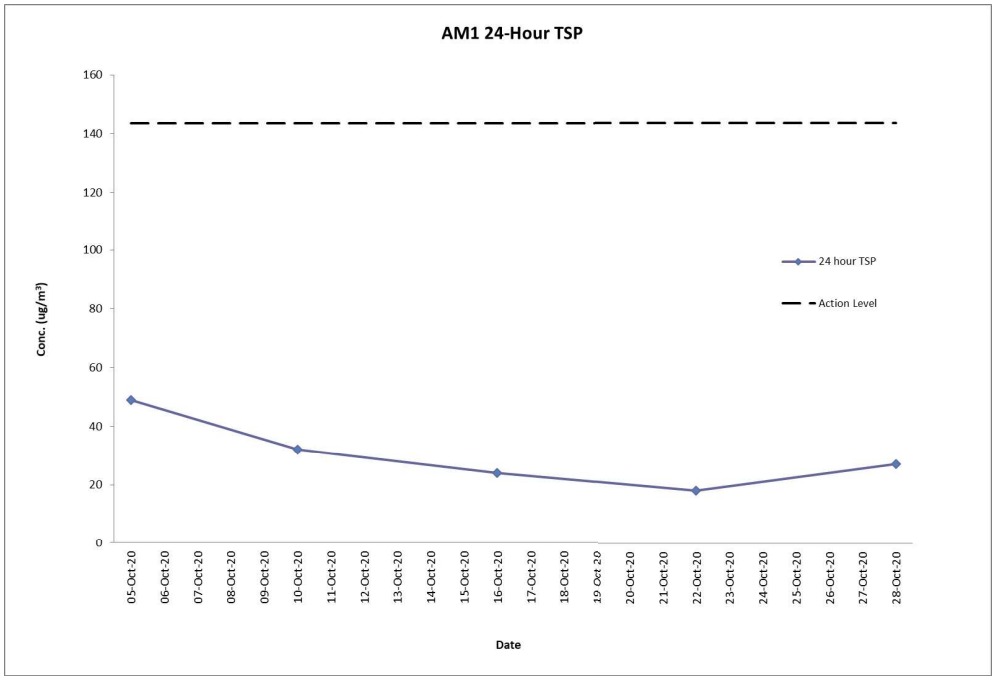
Graphical Presentation of Air Quality Monitoring Result at Station AM2B (1-hour TSP)



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

Start		Finish		Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m^3/min)			Conc. ($\mu g/m^3$)	Weather Condition	Action Level	Limit Level
Date	Time	Date	Time	Initial	Final	Initial	Final		Initial	Final	Average				
05-Oct-20	09:00	06-Oct-20	09:00	2.6969	2.7837	22400.38	22424.38	24	1.22	1.22	1.22	49	Cloudy	143.6	260
10-Oct-20	08:20	11-Oct-20	08:20	2.7182	2.7744	22424.38	22448.38	24	1.22	1.22	1.22	32	Sunny	143.6	260
16-Oct-20	08:13	17-Oct-20	08:13	2.6765	2.7189	22448.38	22472.38	24	1.22	1.22	1.22	24	Sunny	143.6	260
22-Oct-20	08:20	23-Oct-20	08:20	2.6907	2.7227	22472.38	22496.38	24	1.22	1.22	1.22	18	Fine	143.6	260
28-Oct-20	08:18	29-Oct-20	08:18	2.6832	2.7300	22496.38	22520.38	24	1.22	1.22	1.22	27	Cloudy	143.6	260

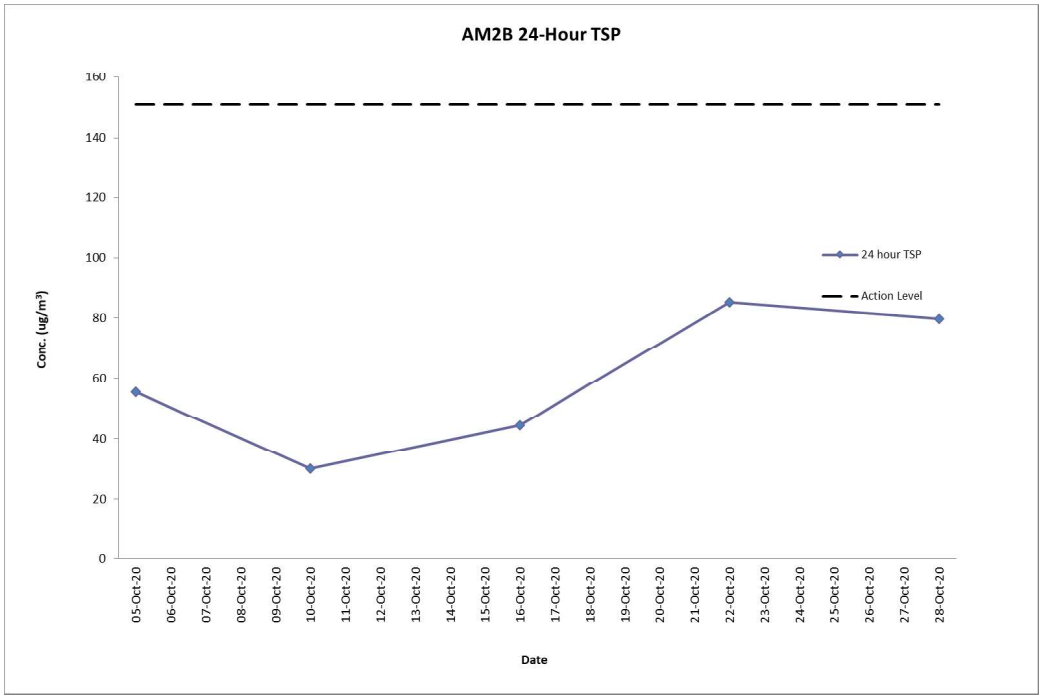
Graphical Presentation of Air Quality Monitoring Result at Station AM1 (24-hour TSP)



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

Start		Finish		Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m^3/min)			Conc. ($\mu g/m^3$)	Weather Condition	Action Level	Limit Level
Date	Time	Date	Time	Initial	Final	Initial	Final		Initial	Final	Average				
05-Oct-20	09:14	06-Oct-20	09:14	2.6895	2.7895	21955.05	21979.05	24	1.25	1.25	1.25	56	Cloudy	151.1	260
10-Oct-20	08:35	11-Oct-20	08:35	2.6990	2.7532	21979.05	22003.05	24	1.25	1.25	1.25	30	Sunny	151.1	260
16-Oct-20	08:28	17-Oct-20	08:28	2.6772	2.7572	22003.05	22027.05	24	1.25	1.25	1.25	44	Sunny	151.1	260
22-Oct-20	08:34	23-Oct-20	08:34	2.6798	2.8329	22027.05	22051.05	24	1.25	1.25	1.25	85	Fine	151.1	260
28-Oct-20	08:35	29-Oct-20	08:35	2.6734	2.8170	22051.05	22075.05	24	1.25	1.25	1.25	80	Cloudy	151.1	260

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



Noise Monitoring Result at Station NM1A

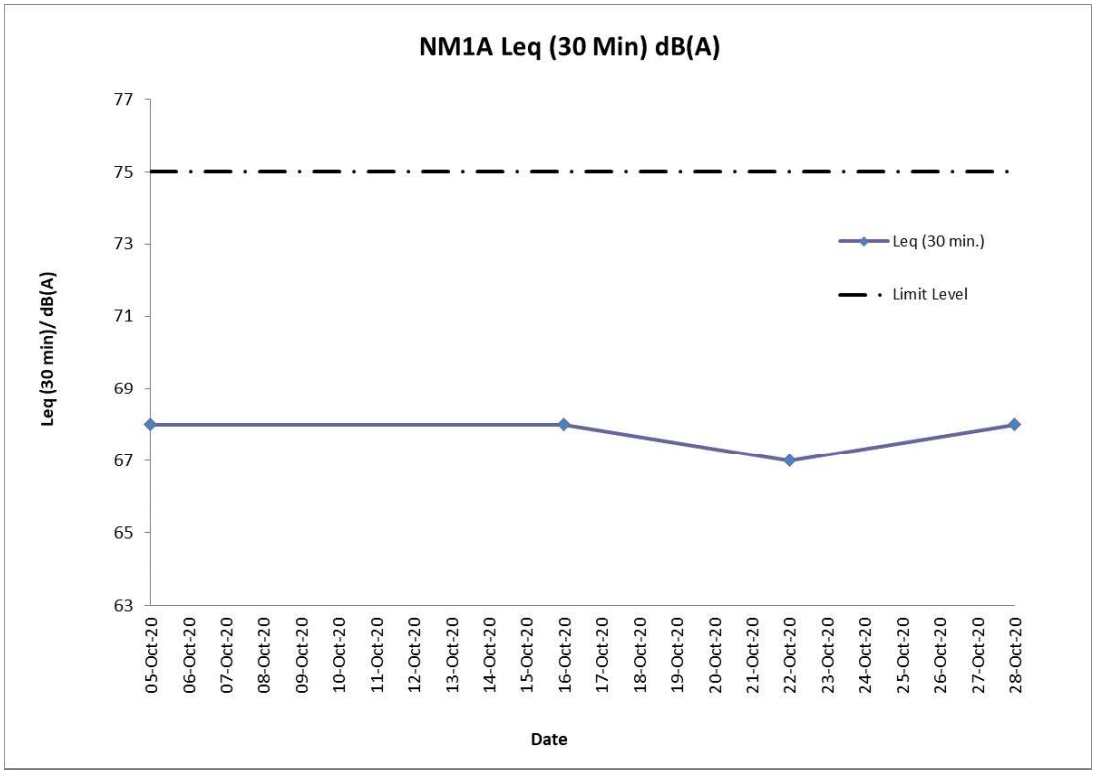
Date	Time	Measured L_{10}, dB(A)	Measured L_{90}, dB(A)	L_{eq} (30 min.)*, dB(A)
05-Oct-20	11:20	66.0	62.3	68
05-Oct-20	11:25	67.9	63.5	
05-Oct-20	11:30	67.8	63.4	
05-Oct-20	11:35	66.6	62.7	
05-Oct-20	11:40	67.3	63.4	
05-Oct-20	11:45	66.4	62.1	
16-Oct-20	10:38	66.5	62.7	68
16-Oct-20	10:43	67.4	63.1	
16-Oct-20	10:48	67.5	63.3	
16-Oct-20	10:53	68.6	64.0	
16-Oct-20	10:58	66.8	62.7	
16-Oct-20	11:03	67.3	63.5	
22-Oct-20	10:42	67.0	63.1	67
22-Oct-20	10:47	66.5	62.1	
22-Oct-20	10:52	66.6	62.5	
22-Oct-20	10:57	65.3	61.5	
22-Oct-20	11:02	65.5	61.7	
22-Oct-20	11:07	66.8	62.3	
28-Oct-20	10:44	66.2	62.3	68
28-Oct-20	10:49	67.6	63.5	
28-Oct-20	10:54	67.5	63.1	
28-Oct-20	10:59	65.7	61.8	
28-Oct-20	11:04	66.3	62.5	
28-Oct-20	11:09	65.4	61.6	

Remarks:

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

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

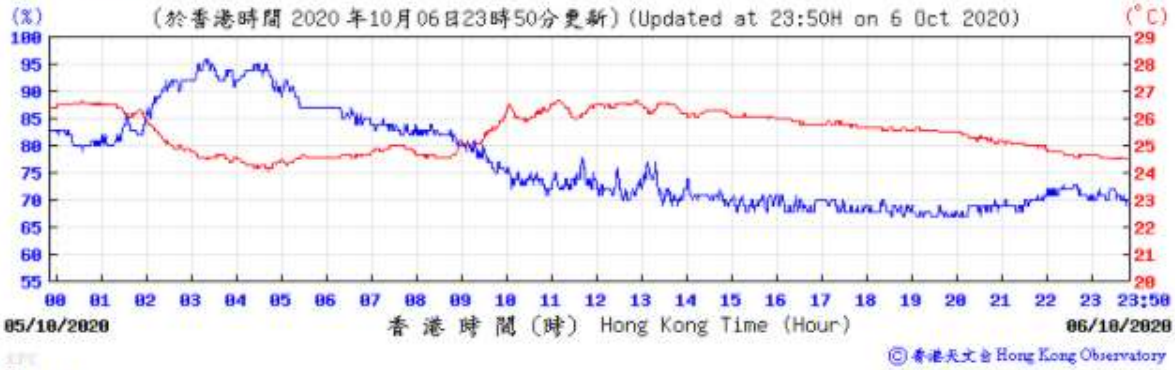
Graphical Presentation Noise Monitoring Result at Station NM1A



H. Meteorological Data Extracted from Hong Kong Observatory

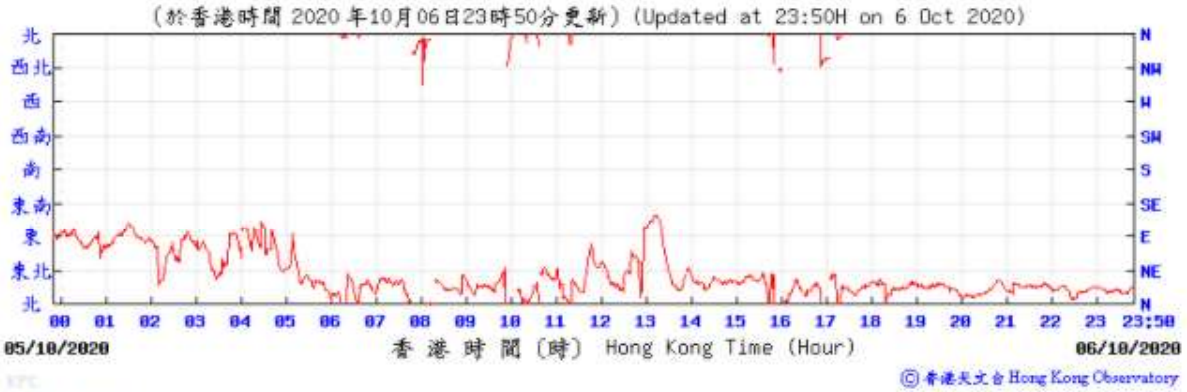
Extract of Meteorological Observations for King's Park Automatic Weather Station, October 2020

Tempearture/Humidity:



Pressure:

Wind Direction:



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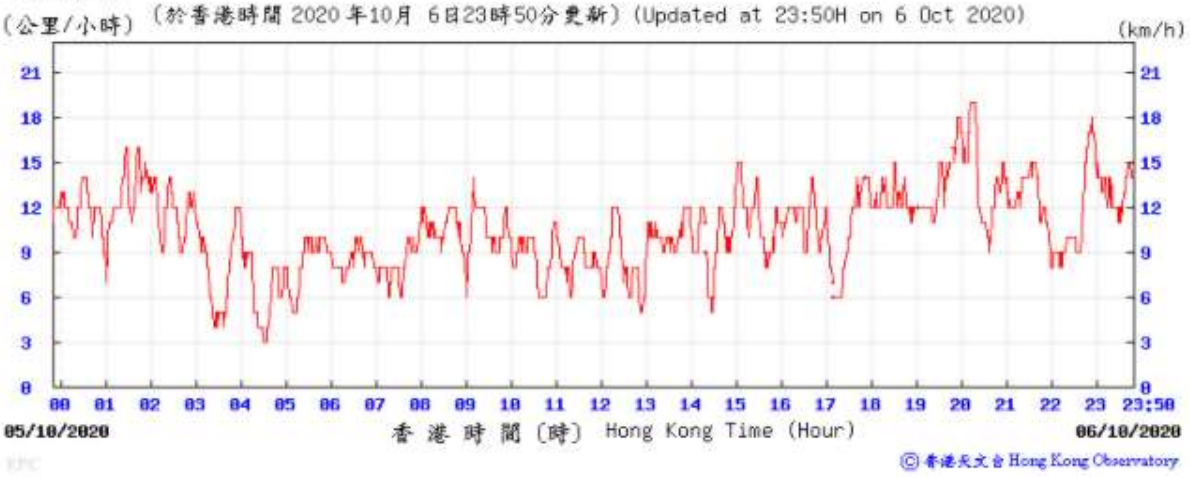

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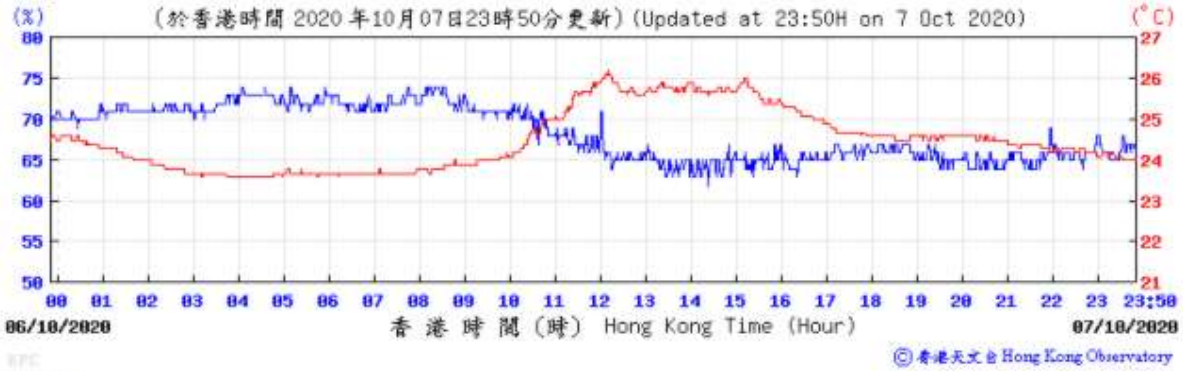

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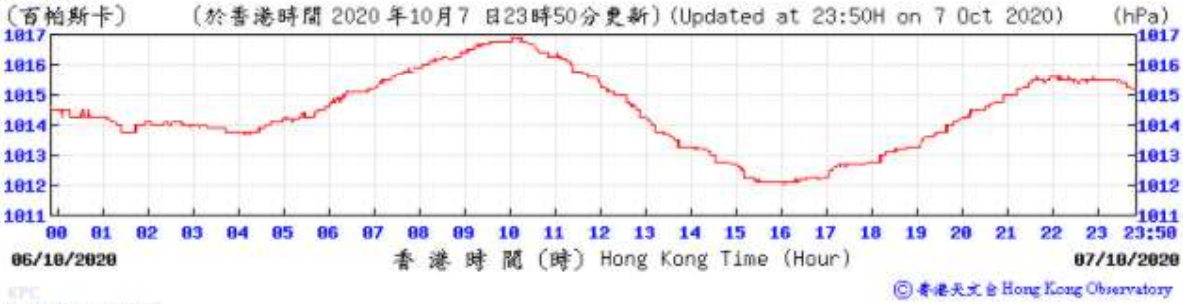

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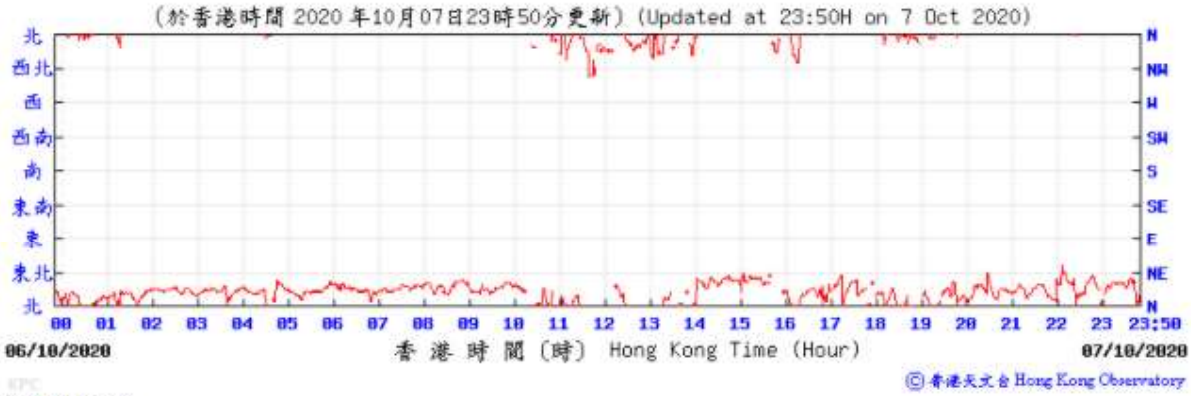
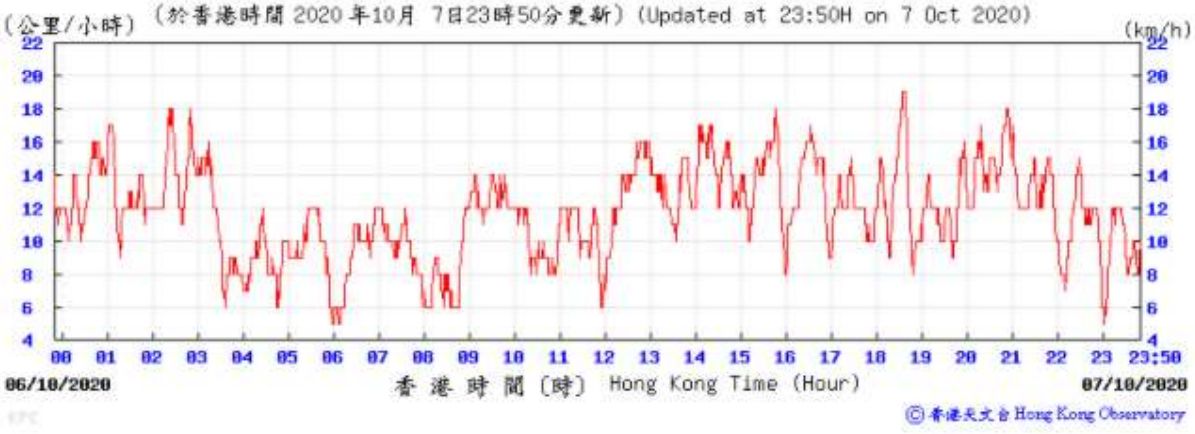


Wind Speed:



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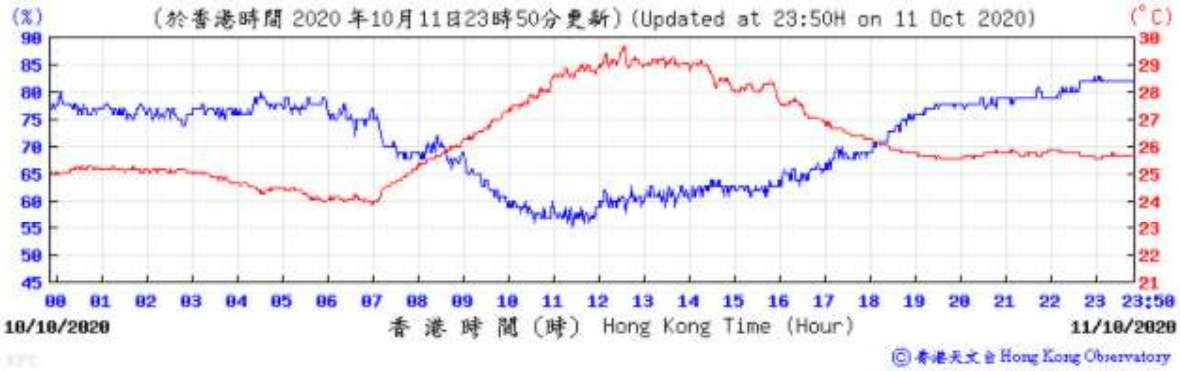

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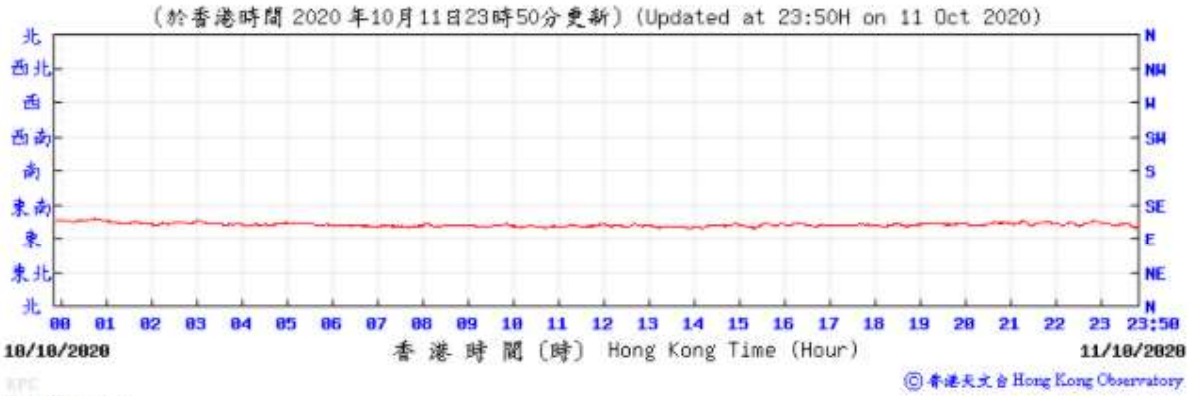
Wind Direction:



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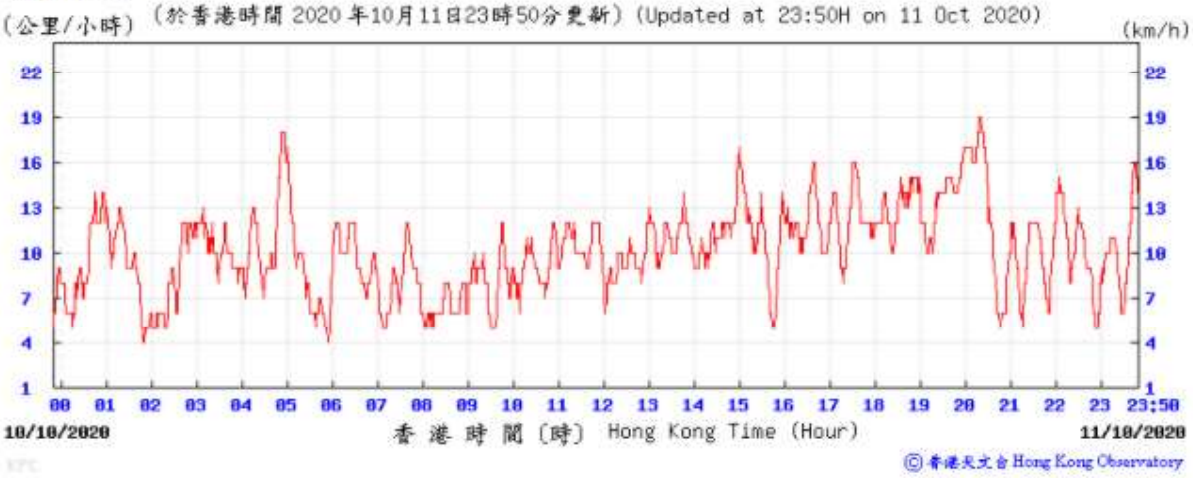

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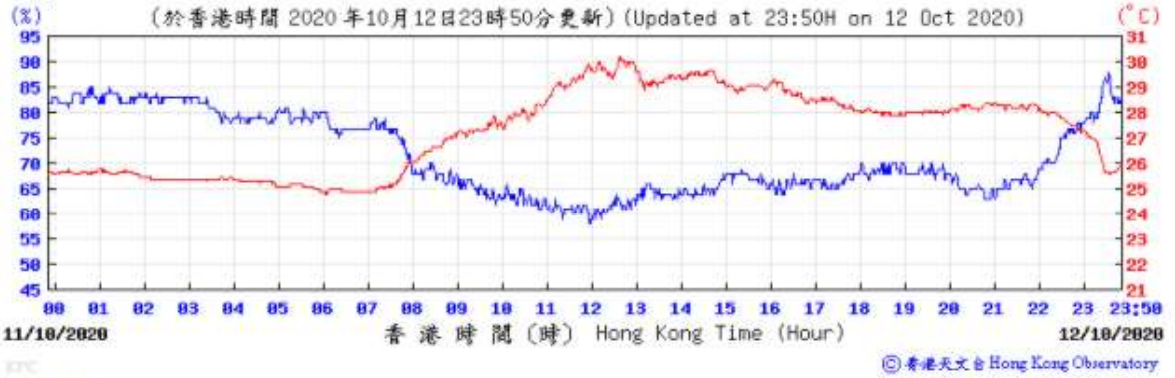

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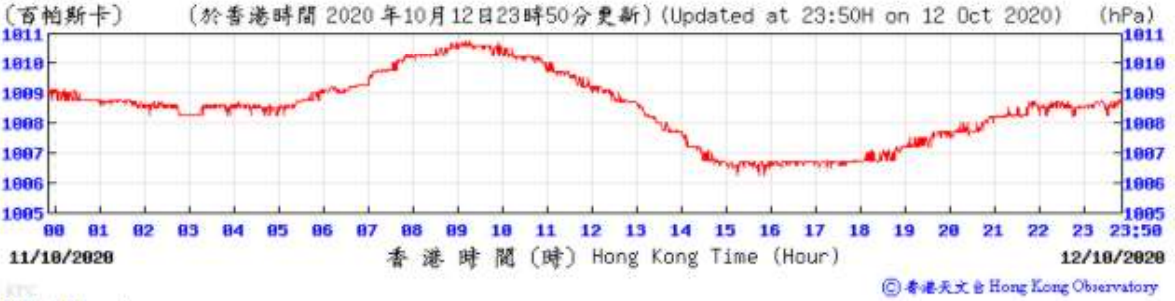

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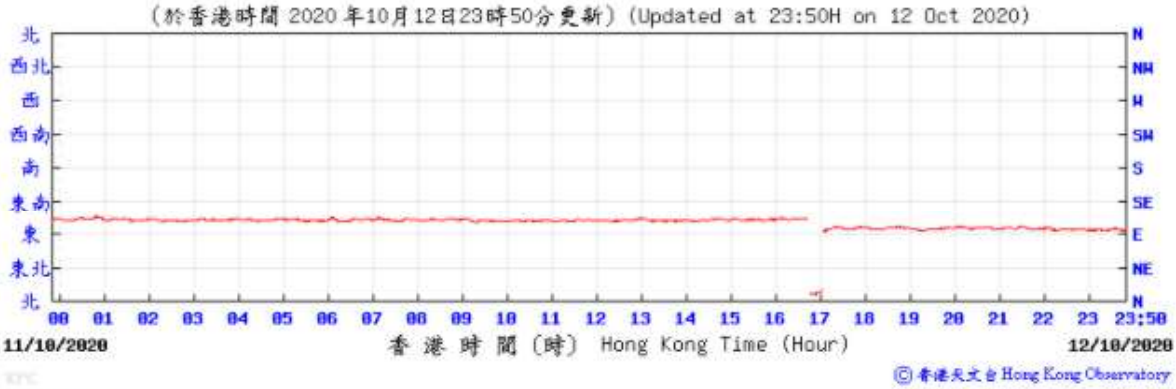

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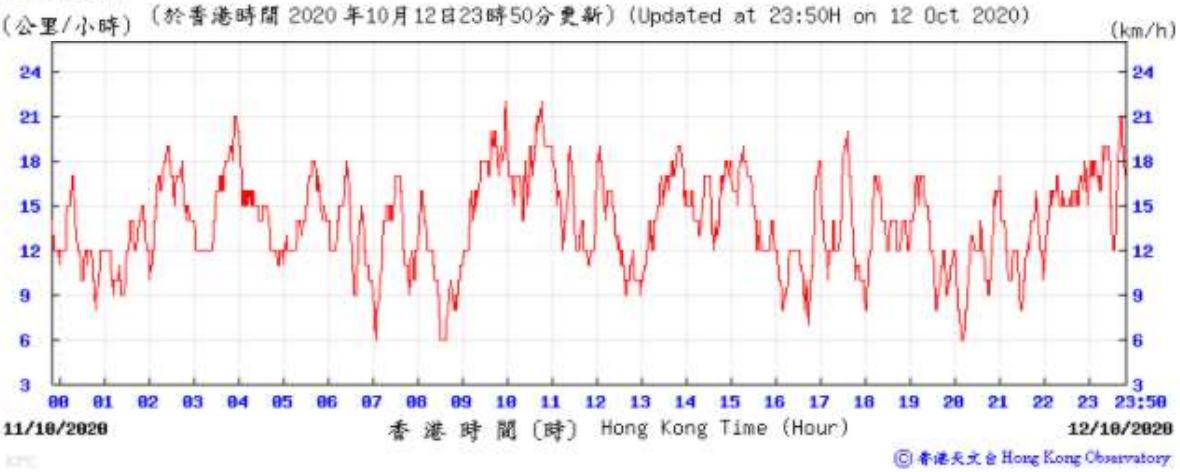

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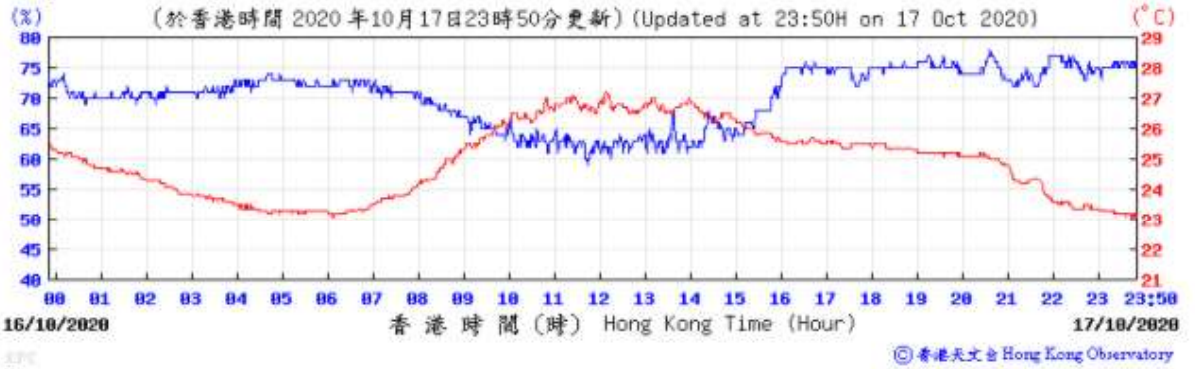

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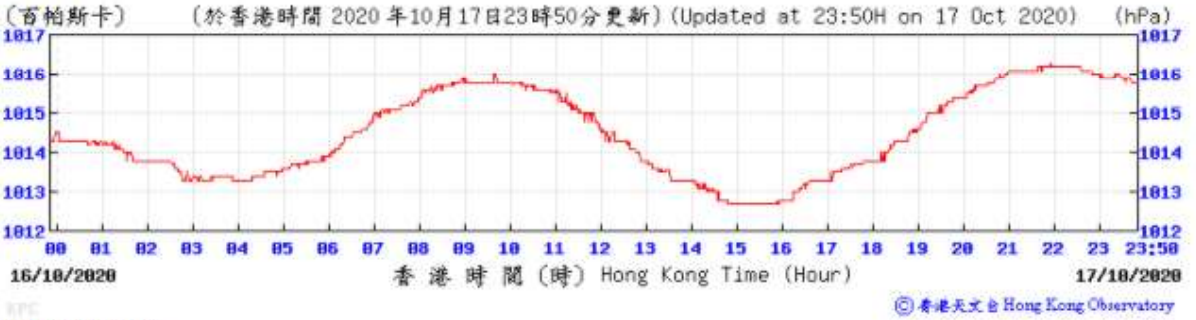

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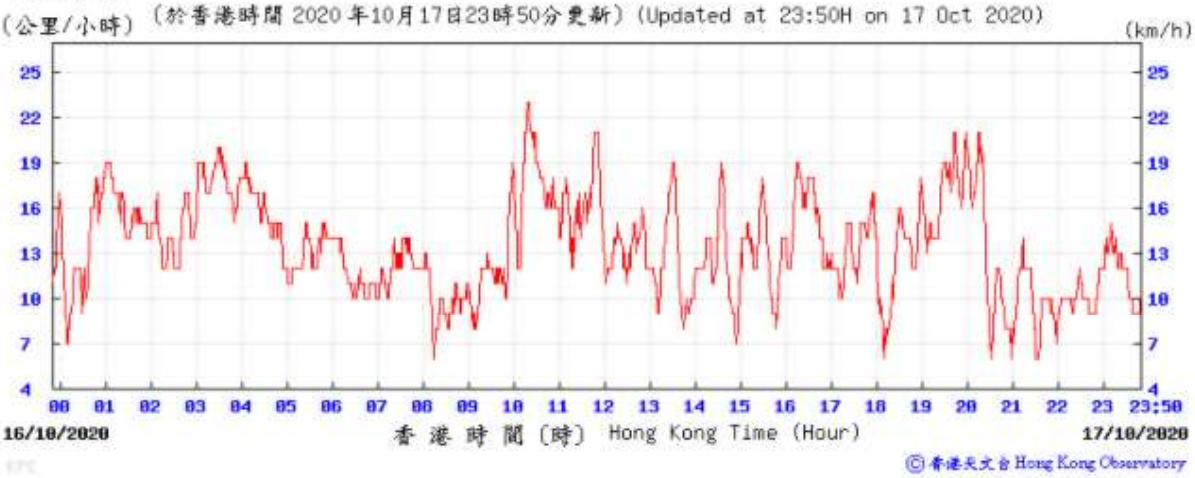
Wind Speed:



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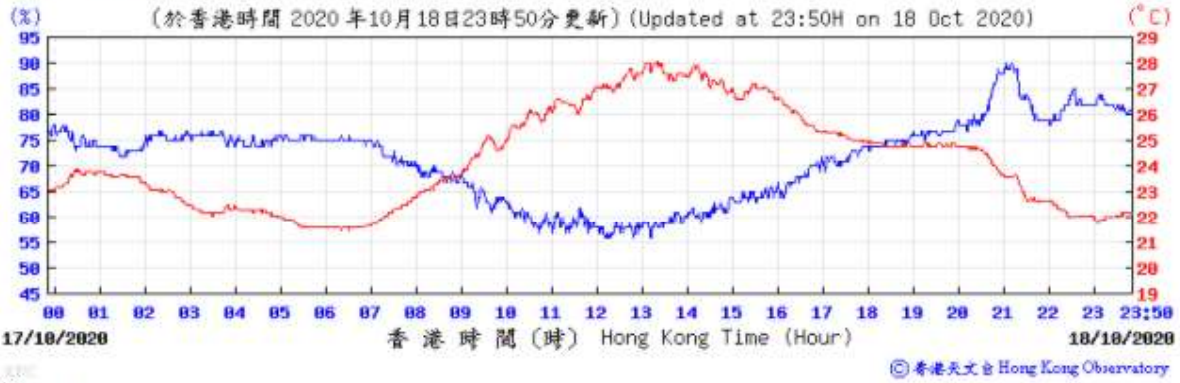

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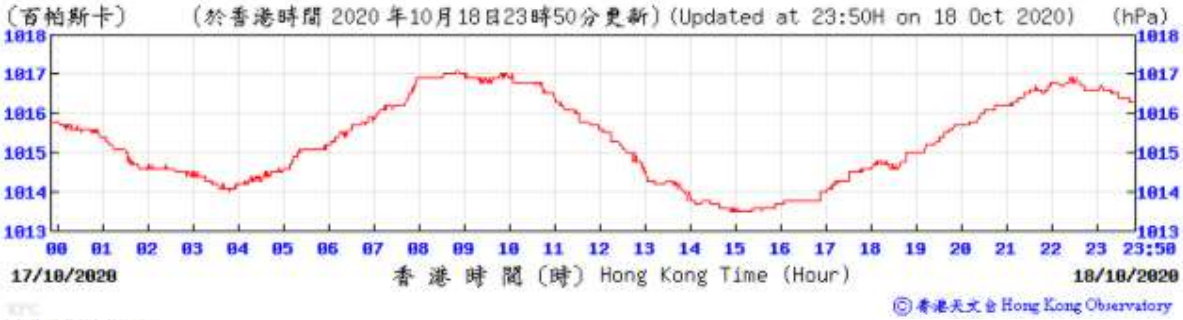

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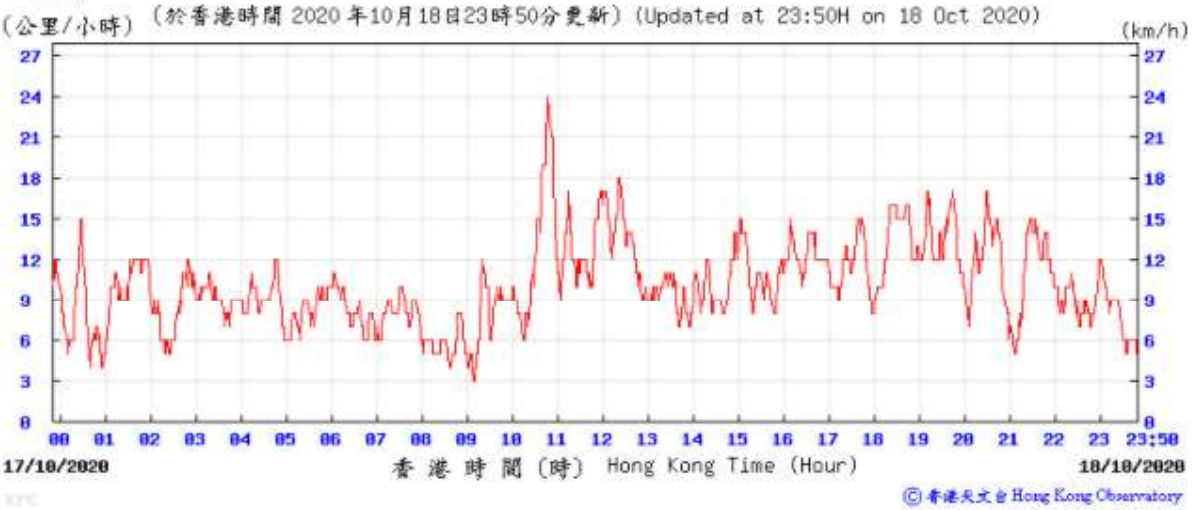

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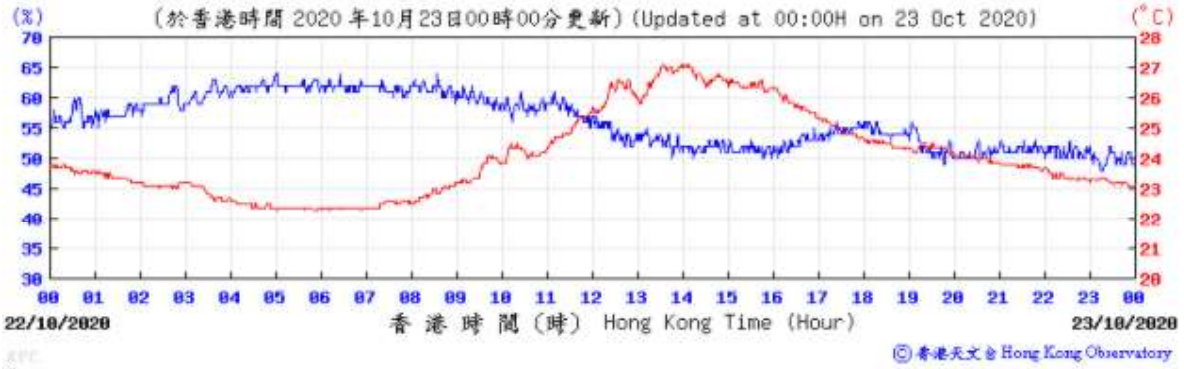

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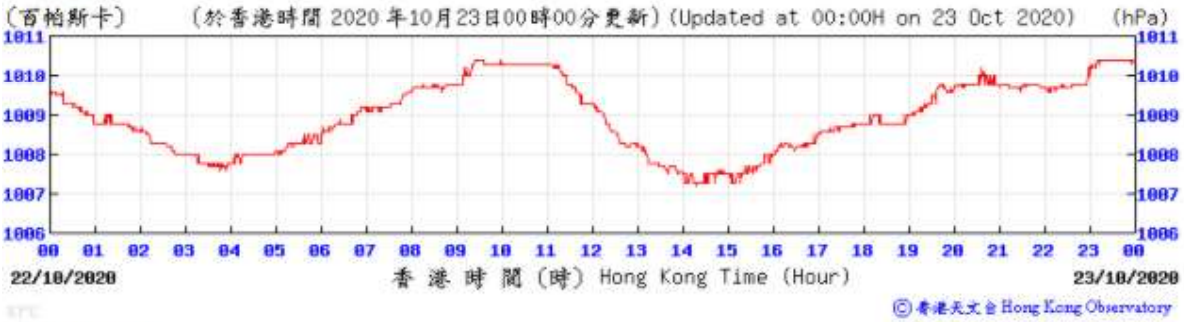

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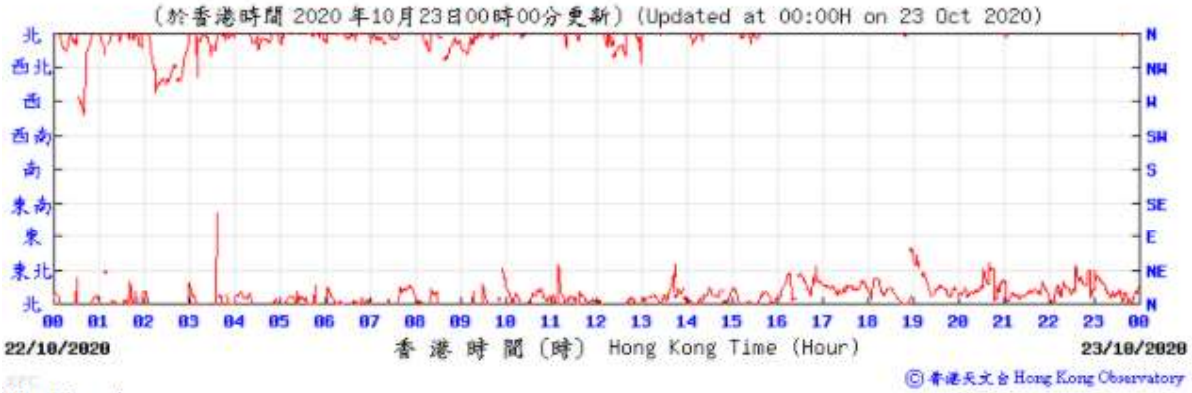

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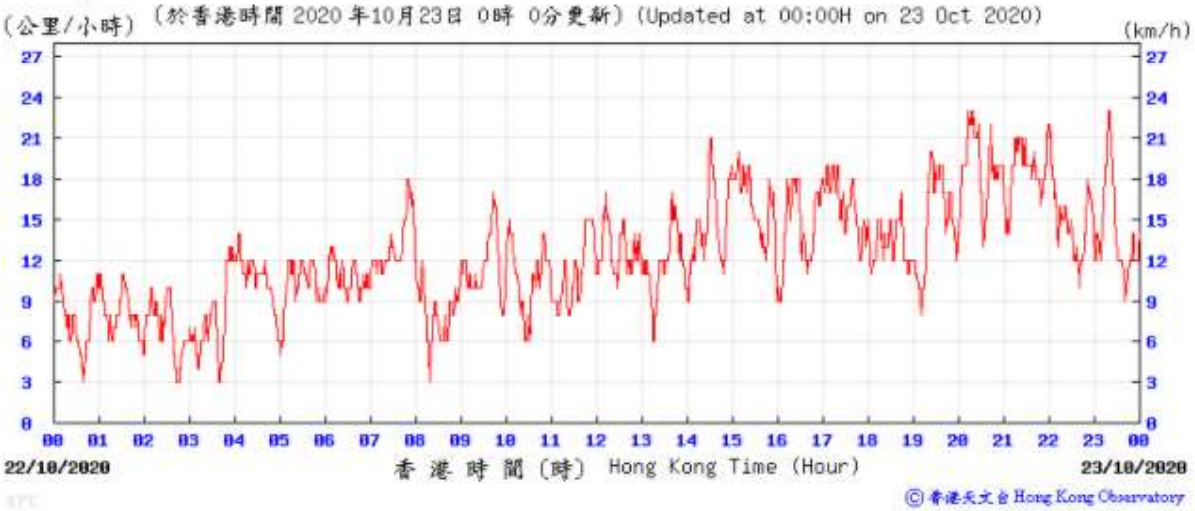

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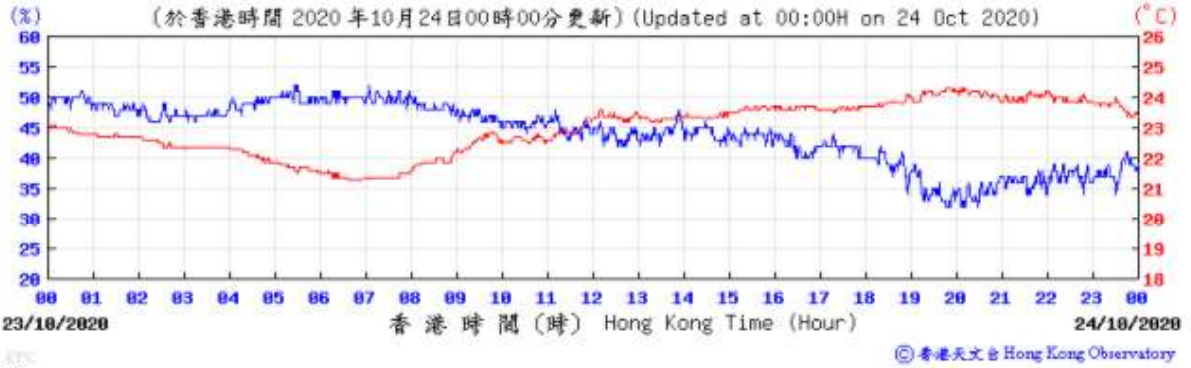

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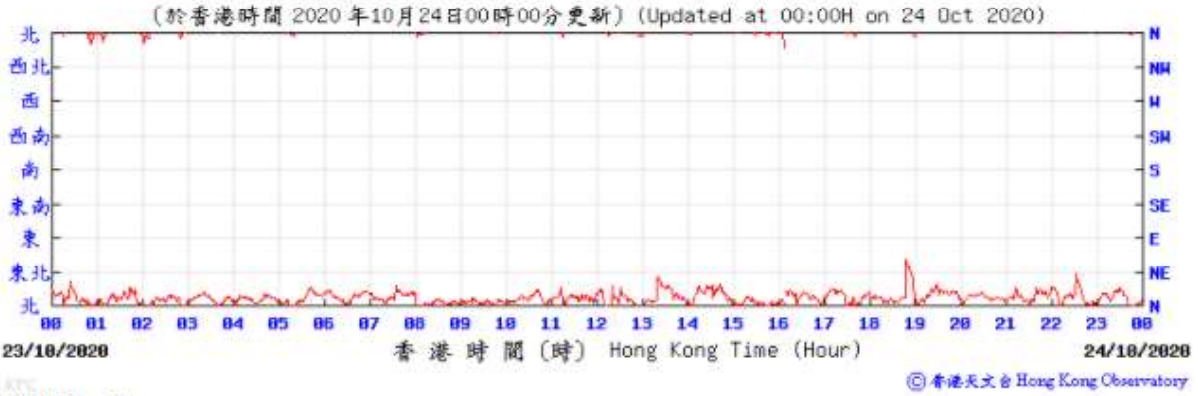
Wind Direction:



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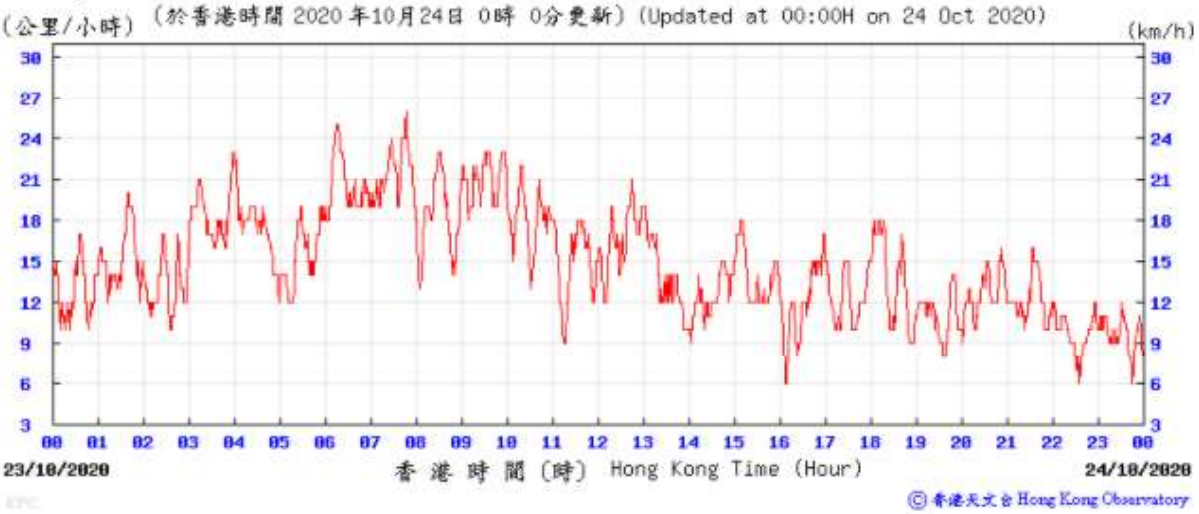

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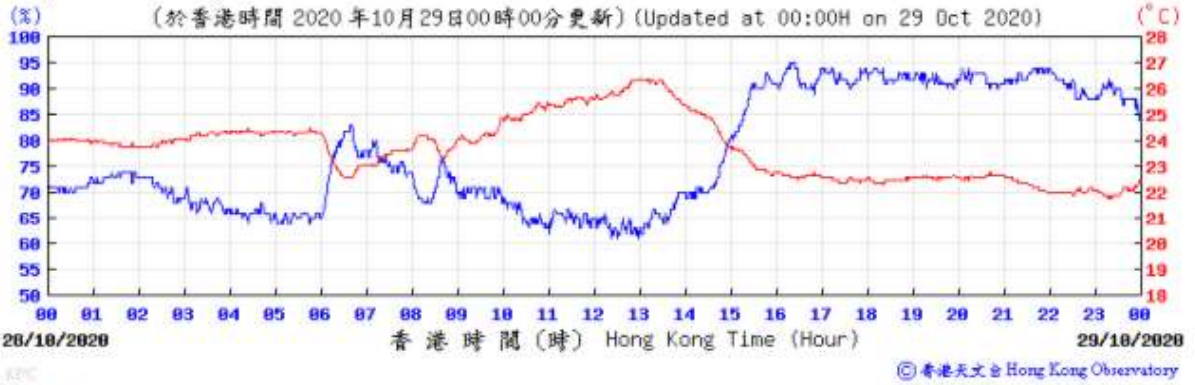

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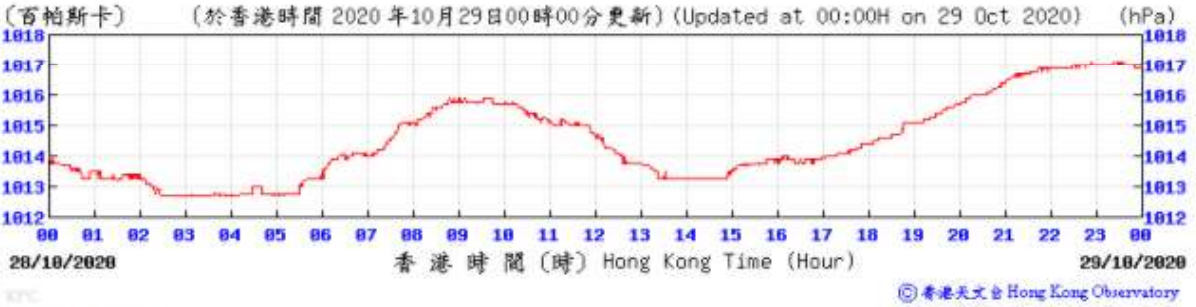

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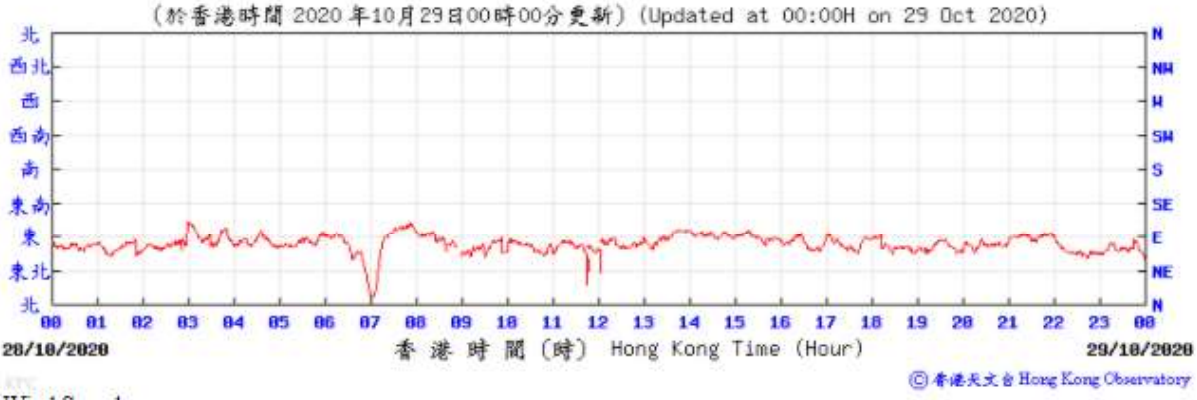

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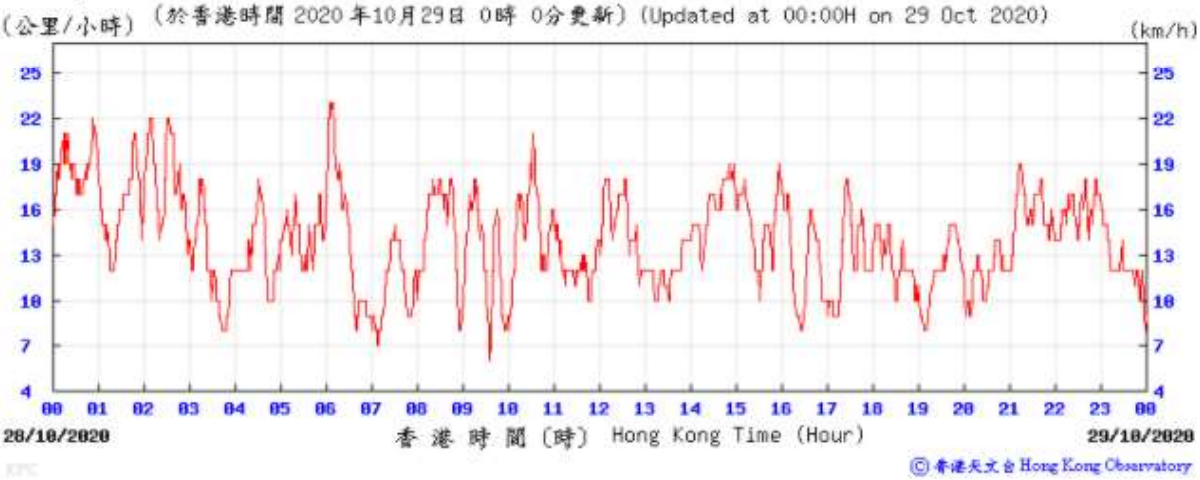

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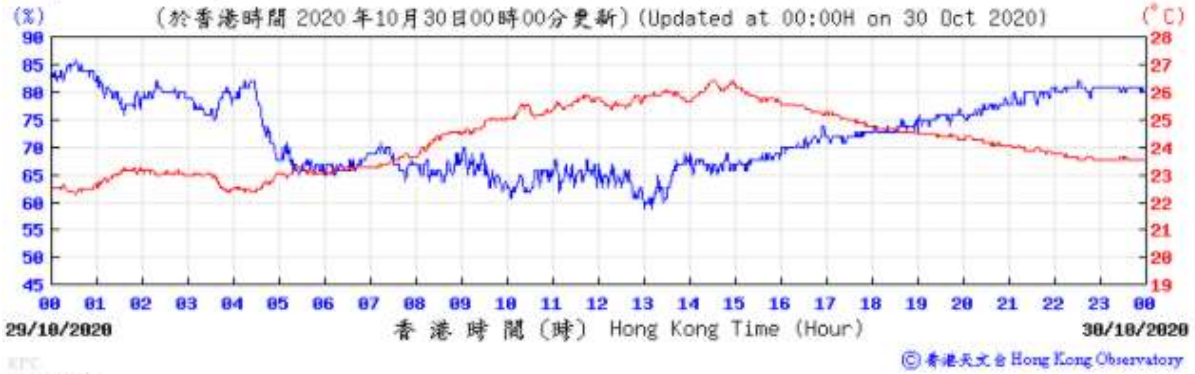

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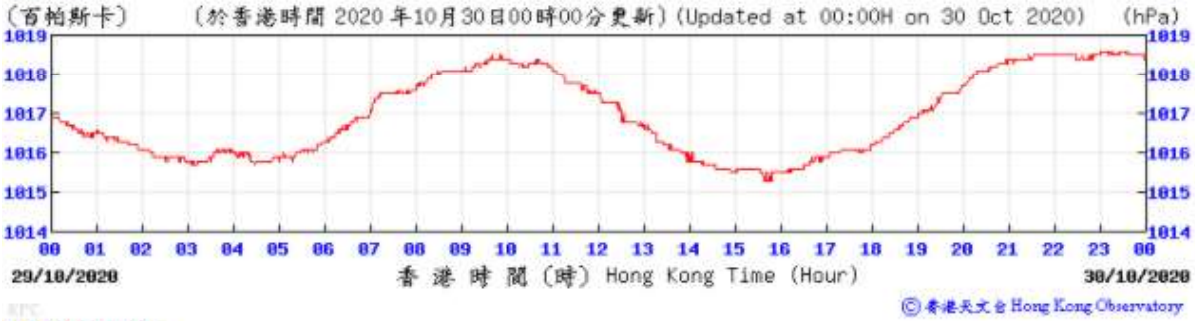
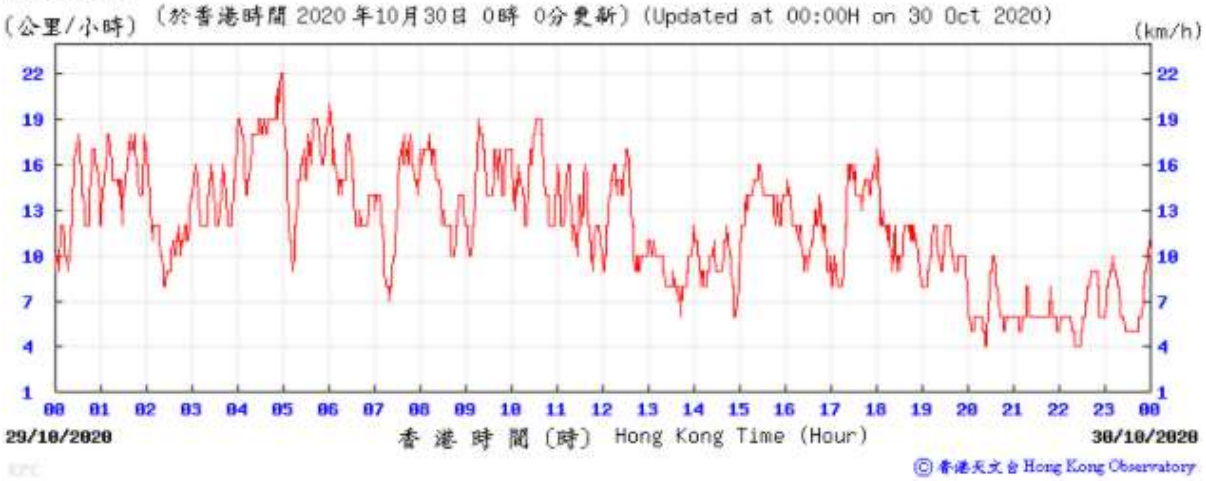


Wind Direction:

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)
2015													
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
2016													
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
2017													
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)
2018													
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
2019													
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)
2020													
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	100.0	0.4	0.0	0.0	0.0	189.3
Oct	76.1	0.0	0.0	0.0	76.1	0.0	0.0	100.0	0.4	0.0	0.0	0.0	227.3
Nov													
Dec													
Sub-total (2020)	4125.9	0.0	0.0	288.0	3660.0	177.9	0.0	1722.6	6.7	2.4	755.0	0.0	3162.3
Total	**251563.6**	**0.0**	**25232.0**	**142604.1**	**72410.9**	**11316.6**	**0.0**	**11864.7**	**35.0**	**5.1**	**7356.2**	**3.2**	**14829.0**

Note:

- 0 tonne, 0 tonne, 76.1 tonnes, 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 Plan

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 Facilty	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)
2016													
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
2017													
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 Facilty	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)
2018													
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
2019													
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	64.5	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	788.8	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 Facilty	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)
2020													
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	0.0	0.0	0.0	0.0	400.1
Nov													
Dec													
Sub-total (2020)	42342.6	0.0	0.0	2068.1	40274.5	0.0	332.5	4366.8	3.1	1.4	0.0	0.0	1933.2
Total	**984458.6**	**0.0**	**0.0**	**543635.2**	**440395.8**	**427.5**	**1825.3**	**6346.8**	**5.2**	**10.0**	**0.0**	**12.5**	**4164.8**

Note:

- 1039.74 tonnes and 341.71 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 (Oct 2020)

EM&A Ref.	Recommendation Measures	Implementation Stage		
		M+ Museum	L1	L2
Air Quality Impact (Construction)				
2.1 & 10.3.1	**General Dust Control Measures** 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)	✓	Rem	✓
2.1 & 10.3.1	**Best Practice For Dust Control** 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:			
	Good Site Management			
	• 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.	Rem	✓	✓
	Disturbed Parts of the Roads			
	• Each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or	✓	✓	✓
	• Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet.	✓	✓	✓

EM&A Ref.	Recommendation Measures	Implementation Stage		
		M+ Museum	L1	L2
	Exposed Earth			
	• 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.	N/A No exposed earth in this project.	N/A No exposed earth in this project.	N/A No exposed earth in this project.
	Loading, Unloading or Transfer of Dusty Materials			
	• All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet.	✓	✓	✓
	Debris Handling			
	• Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides.	✓	✓	✓
	• Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped.	✓	✓	✓
	Transport of Dusty Materials			
	• 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.	✓	✓	✓
	Wheel washing			
	• 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.	✓	✓	✓
	Use of vehicles			
	• 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.	✓	✓	✓
	• Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels.	✓	✓	✓
	• 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.	✓	✓	✓

EM&A Ref.	Recommendation Measures	Implementation Stage M+ Museum	L1	L2
	Site hoarding • 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.	✓	✓	✓
2.1 & 10.3.1	**Best Practicable Means for Cement Works (Concrete Batching Plant)** 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: Exhaust from Dust Arrestment Plant • 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	N/A No concrete batching plant in this project.	N/A No concrete batching plant in this project.	N/A No concrete batching plant in this project.
	Emission Limits • All emissions to air, other than steam or water vapour, shall be colourless and free from persistent mist or smoke	N/A No concrete batching plant in this project.	N/A No concrete batching plant in this project.	N/A No concrete batching plant in this project.
	Engineering Design/Technical Requirements • 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	N/A No concrete batching plant in this project.	N/A No concrete batching plant in this project.	N/A No concrete batching plant in this project.
	Non-Road Mobile Machinery (NRMM): 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.	✓	✓	✓

EM&A Ref.	Recommendation Measures	Implementation Stage		
		M+ Museum	L1	L2
Noise Impact (Construction)				
3.1 & 10.4.1	**Good Site Practice** 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:			
	• only well-maintained plant to be operated on-site and plant should be serviced regularly during the construction works;	✓	✓	✓
	• machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum	✓	✓	✓
	• plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs;	✓	✓	✓
	• mobile plant should be sited as far away from NSRs as possible; and	✓	✓	✓
	• material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site construction activities.	✓	✓	✓
3.1 & 10.4.1	**Adoption of Quieter PME** 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 **Table 4.26** 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	**Use of Movable Noise Barriers** 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	**Use of Noise Enclosure/ Acoustic Shed** 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 & 10.4.1	**Use of Noise Insulating Fabric** 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 & 10.4.1	**Scheduling of Construction Works outside School Examination Periods** 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 No educational institutions nearby the site.	N/A No educational institutions nearby the site.	N/A No educational institutions nearby the site.
Water Quality Impact (Construction)				
4.1 & 10.5.1	**Construction site runoff and drainage** 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: • 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;	✓	✓	✓

EM&A Ref.	Recommendation Measures	Implementation Stage		
		M+ Museum	L1	L2
	• 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.	✓	✓	✓
	• 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.	✓	✓	✓
	• 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.	✓	✓	✓
	• 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.	✓	✓	✓
	• 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.	✓	✓	✓

EM&A Ref.	Recommendation Measures	Implementation Stage M+ Museum	L1	L2
	• 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.	Rem Obs	✓	✓
	• 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.	✓	✓	✓
	• 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.	N/A No bentonite slurries are used in this project.	N/A No bentonite slurries are used in this project.	N/A No bentonite slurries are used in this project.
	Barging facilities and activities Recommendations for good site practices during operation of the proposed barging point include:			
	• 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;	N/A No barging facilities in this project.	N/A No barging facilities in this project.	N/A No barging facilities in this project.
	• 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;	N/A No barging facilities in this project.	N/A No barging facilities in this project.	N/A No barging facilities in this project.
	• All hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; and	N/A No barging facilities in this project.	N/A No barging facilities in this project.	N/A No barging facilities in this project.
	• Construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site.	N/A No barging facilities in this project.	N/A No barging facilities in this project.	N/A No barging facilities in this project.

EM&A Ref.	Recommendation Measures	Implementation Stage		
		M+ Museum	L1	L2
4.1 & 10.5.1	**Sewage effluent from construction workforce** 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.	Obs	✓	✓
4.1 & 10.5.1	**General construction activities**			
	• 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.	✓	✓	✓
	• 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.	✓	✓	✓
Waste Management Implications (Construction)				
6.1 & 10.7.1	**Good Site Practices** Recommendations for good site practices during the construction activities include:			
	• Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site	✓	✓	✓
	• Training of site personnel in proper waste management and chemical handling procedures	✓	✓	✓
	• Provision of sufficient waste disposal points and regular collection of waste	Rem	✓	✓
	• Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by either covering trucks or by transporting wastes in enclosed containers	✓	✓	✓

EM&A Ref.	Recommendation Measures	Implementation Stage		
		M+ Museum	L1	L2
	• Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction to public roads	✓	✓	✓
	• Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting the inert or non-inert C&D materials is not anticipated	✓	✓	✓
6.1 & 10.7.1	**Waste Reduction Measures** Recommendations to achieve waste reduction include:			
	• Sort inert C&D material to recover any recyclable portions such as metals	✓	✓	✓
	• Segregation and storage of different types of waste in different containers or skips to enhance reuse or recycling of materials and their proper disposal	✓	✓	✓
	• 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	✓	✓	✓
	• Proper site practices to minimise the potential for damage or contamination of inert C&D materials	✓	✓	✓
	• Plan the use of construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of wastes	✓	✓	✓
6.1 & 10.7.1	**Inert and Non-inert C&D Materials** 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.	✓	✓	✓
	• The surplus inert C&D material will be disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong.	✓	✓	✓
	• Liaison with the CEDD Public Fill Committee (PFC) on the allocation of space for disposal of the inert C&D materials at PFRF is underway. No construction work is allowed to proceed until all issues on management of inert C&D materials have been resolved and all relevant arrangements have been endorsed by the relevant authorities including PFC and EPD.	✓	✓	✓

EM&A Ref.	Recommendation Measures	Implementation Stage		
		M+ Museum	L1	L2
	• 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.	✓	✓	✓
6.1 & 10.7.1	**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.	✓	✓	✓
	• 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.	✓	✓	✓

EM&A Ref.	Recommendation Measures	Implementation Stage		
		M+ Museum	L1	L2
6.1 & 10.7.1	**General Refuse** 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.	✓	✓	✓
Land Contamination (Construction)				
7.1 & 10.8.1	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:			
	• To minimize the chance for construction workers to come into contact with any contaminated materials, bulk earth-moving excavation equipment should be employed;	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.
	• 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;	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.
	• Stockpiling of contaminated excavated materials on site should be avoided as far as possible;	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A 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
	• The use of contaminated soil for landscaping purpose should be avoided unless pre-treatment was carried out;	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.
	• Vehicles containing any contaminated excavated materials should be suitably covered to reduce dust emissions and/or release of contaminated wastewater;	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.
	• Truck bodies and tailgates should be sealed to stop any discharge;	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.
	• 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;	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.
	• Speed control for trucks carrying contaminated materials should be exercised;	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.
	• 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	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.
	• Maintain records of waste generation and disposal quantities and disposal arrangements.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.	N/A 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)				

		Implementation Stage		
EM&A Ref.	Recommendation Measures	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 Compensatory tree planting is being reviewed.	N/A 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 Roof garden is designed to be built, but it has not been completed yet.	N/A 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 Climbing or weeping plants are designed to be planted, but proposal is being reviewed for the planting location.	N/A 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 Roof garden is designed to be built, but it has not been completed yet.	N/A 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 Greening along the seafront is proposed, but it has not been completed yet.	N/A 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 Gardens are designed to be built, but it has not been completed yet.	N/A Gardens are designed to be built, but it has not been completed yet.

		Implementation Stage		
EM&A Ref.	Recommendation Measures	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 Roof garden is designed to be built, but it has not been completed yet.	N/A 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 No marine facilities for this project.	N/A No marine facilities for this project.	N/A 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 No landscape treatments during this stage.	N/A 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 No ventilation shafts for this project.	N/A No ventilation shafts for this project.	N/A 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 No temporary open areas for this project.	N/A No temporary open areas for this project.	N/A 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	0	0	0
From 31 October 2015 to end of the reporting month (Oct 2020)	10	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	0	0	0
From 1 March 2016 to end of the reporting month (Oct 2020)	13	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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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 3 to 31 October 2020.

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 in this reporting month.

Implementation of Mitigation Measures

Construction phase weekly site inspections were carried out on 8, 15, 22 and 29 October 2020 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

No environmental complaints were 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)
- Bored Pile Works
  - Bored Pile Works (Predrilling)
  - Bored Pile Construction

- ELS (Stage 1)
  - Grouting Works

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 3 to 31 October 2020. 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 Zone 2A undertaken include:

- Preliminaries Works
- Grouting Curtain Works (Trial 1 & Trial 2)
- Bored Pile Works
  - Bored Pile Works (Predrilling)
  - Bored Pile Construction
- ELS (Stage 1)
  - Grouting Works

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 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
24-hour TSP monitoring	
High Volume Sampler	TE-5170 (Serial No.: 4340; 3998; 4344)
Calibrator	TE-5025A (Orifice I.D.: 3543)

Equipment	Model
1-hour TSP monitoring	
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^3/min. The range specified in the EM&A Manual was between 0.6-1.7 m^3/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 (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.

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

2.3.2 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.: 304723)	Pulsar 100B (Serial No.: 039507)

2.3.3 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 (µg/m3)			Range (µg/m3)	Action Level (µg/m3)	Limit Level (µg/m3)
			1st Result	2nd Result	3rd Result			
AM3A	03 Oct 20	8:06	56	60	53	42-77	280.4	500
	07 Oct 20	14:09	45	53	46			
	12 Oct 20	8:13	61	59	66			
	17 Oct 20	14:17	56	62	53			
	19 Oct 20	8:04	48	51	42			
	24 Oct 20	14:12	67	77	72			
	30 Oct 20	8:18	68	64	70			
AM4A	03 Oct 20	8:14	61	54	53	43-73	278.5	500
	07 Oct 20	14:17	49	55	53			
	12 Oct 20	8:21	60	54	58			
	17 Oct 20	14:25	51	60	64			
	19 Oct 20	8:12	55	43	59			
	24 Oct 20	14:20	61	62	73			
	30 Oct 20	8:26	64	62	69			
AM5A	03 Oct 20	8:29	64	63	51	42-76	275.4	500
	07 Oct 20	14:34	48	50	43			
	12 Oct 20	8:36	63	55	61			
	17 Oct 20	14:42	61	58	66			
	19 Oct 20	8:27	43	42	57			
	24 Oct 20	14:37	60	64	76			
	30 Oct 20	8:41	61	76	72			

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 (μg/m^3)	Range (μg/m^3)	Action Level (μg/m^3)	Limit Level (μg/m^3)
AM3A	03 Oct 20	10:00	51.6	40.6-65.3	152.4	260
	07 Oct 20	10:00	44.2			
	12 Oct 20	10:00	57.2			
	17 Oct 20	10:00	56.7			
	19 Oct 20	10:00	40.6			
	24 Oct 20	10:00	65.3			
	30 Oct 20	10:00	63.2			
AM4A	03 Oct 20	10:00	50.8	43.2-62.0	152.6	260
	07 Oct 20	10:00	45.7			
	12 Oct 20	10:00	53.8			
	17 Oct 20	10:00	49.9			
	19 Oct 20	10:00	43.2			
	24 Oct 20	10:00	62.0			
	30 Oct 20	10:00	59.3			
AM5A	03 Oct 20	10:00	49.5	40.6-61.1	141.1	260
	07 Oct 20	10:00	40.6			
	12 Oct 20	10:00	53.6			
	17 Oct 20	10:00	58.5			
	19 Oct 20	10:00	40.9			
	24 Oct 20	10:00	57.2			
	30 Oct 20	10:00	61.1			

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	03 Oct 20	08:06	08:36	63.9	75
	07 Oct 20	14:09	14:39	62.7	
	12 Oct 20	08:13	08:43	64.2	
	17 Oct 20	14:17	14:47	62.1	
	19 Oct 20	08:04	08:34	63.0	
	24 Oct 20	14:12	14:42	62.4	
	30 Oct 20	08:18	08:48	63.2	
NM3A	03 Oct 20	09:45	10:15	74.2	75
	07 Oct 20	15:51	16:21	73.4	
	12 Oct 20	09:52	10:22	73.6	
	17 Oct 20	15:59	16:29	73.1	

Monitoring Stations	Monitoring Date	Start Time	End Time	L_{eq} (30 mins) dB(A)	Limit Level for L_{eq} (dB(A))
	19 Oct 20	09:43	10:13	73.7	
	24 Oct 20	15:54	16:24	73.5	
	30 Oct 20	10:00	10:30	74.0	
NM4A	03 Oct 20	10:20	10:50	66.3	70^#
	07 Oct 20	16:26	16:56	67.7	
	12 Oct 20	10:27	10:57	67.1	
	17 Oct 20	16:34	17:04	66.6	
	19 Oct 20	10:18	10:48	66.8	
	24 Oct 20	16:29	16:59	67.4	
	30 Oct 20	10:35	11:05	66.7	
NM5A*	03 Oct 20	09:05	09:35	64.3	75
	07 Oct 20	15:10	15:40	65.2	
	12 Oct 20	09:12	09:42	64.1	
	17 Oct 20	15:18	15:48	64.7	
	19 Oct 20	09:03	09:33	65.3	
	24 Oct 20	15:13	15:43	64.9	
	30 Oct 20	09:19	09:49	65.1	

Remarks:

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

^ 70 dB(A) for schools and 65 dB(A) during school examination periods.

No school examination 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 19 to 24 October, and 27 to 31 October 2020 and to holidays on 18, 25 and 26 October 2020. In accordance with the EM&A Manual, additional monitoring was carried out during the restricted hours on 18, 19, 24, 25 and 30 October 2020. the L_{eq} (5 mins) is in the range of 52.4-69.8 dB(A). Construction Noise Permits for the works carried out during restricted hours were obtained and listed in **Table 4.2**.

3.4 Landscape and Visual Impact

Landscape and visual impact inspections were conducted as part of the weekly site inspections on 15 and 29 October 2020 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 Environmental Site Inspection

4.1 Site Inspection

Construction phase weekly site inspections were carried out on 8, 15, 22 and 29 October 2020. The joint site inspection with IEC, ET, ER and Contractor was held on 22 October 2020. 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	Contactor's Responses / Action(s) Undertaken	Close-out (Date)
08-Oct-20	Air Quality	Stockpile was found without proper cover. Contractor was reminded to cover it with impervious sheeting or removed it from the site.	The contractor has removed the stockpile.	09-Oct-20
08-Oct-20	Noise	Noise barrier are suggested to provide at sensitive area while noisy construction works carried out.	Noise barrier was provided.	09-Oct-20
08-Oct-20	Water Quality	Contractor was reminded to clean the settlement pool to handle stormwater during rainstorm.	The contractor has cleaned the settlement pool regularly.	10-Oct-20
15-Oct-20	Air Quality	Stockpile was found without proper cover. The contractor was reminded to cover it with impervious sheeting or removed it from the site.	The stockpile was fully covered by impervious sheet.	16-Oct-20
15-Oct-20	Noise	Noise insulating fabric should be lapped and avoid gap between to maintain proper function.	Noise insulating fabric was fixed to minimise gap occurred.	17-Oct-20
15-Oct-20	Water Quality	Contractor was suggested to provide sump pump to collect and direct stormwater from slope to the water treatment facilities.	Sump pump system has provided.	22-Oct-20
15-Oct-20	Water Quality	Drip tray should be provided to prevent chemical leakage.	Drip tray was provided to prevent chemical leakage.	16-Oct-20
22-Oct-20	Air Quality	Stockpile was found without proper cover. Contractor was reminded to cover it with impervious sheeting or removed it from the site.	The stockpile was fully covered by impervious sheet.	23-Oct-20
22-Oct-20	Water Quality	Contractor are reminded to U-channel should be cleaned regularly.	U-channel was cleaned by contractor regularly.	23-Oct-20

Inspection Date	Parameter	Observation / Recommendation	Contactor's Responses / Action(s) Undertaken	Close-out (Date)
29-Oct-20	Air Quality	Stockpile was found without proper cover. Contractor was reminded to cover it with impervious sheeting or removed it from the site.	The stockpile was fully covered by impervious sheet.	30-Oct-20
29-Oct-20	Water Quality	Contractor was reminded the sump pump system need to be connect and maintain proper function.	Contractor maintained sump pump system functioned properly.	30-Oct-20
29-Oct-20	Water Quality	Contractor are reminded to U-channel should be cleaned regularly. The stockpile nearby the U-channel shall fully cover and/or move away to prevent washing away of materials into the drainage system.	The U-channel was cleaned by contractor regularly. The Stockpile was covered with tarpaulin.	30-Oct-20

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, 18.79 tonnes, 93.03 tonnes, 2511.66 tonnes of inert C&D material were disposed of as public fill to Chai Wan Public Fill Barging Point, Tseung Kwan O Area 137 Public Fill, and Tuen Mun Area 38 respectively in the reporting month; and 21.94 tonnes of general refuse were disposed of at SENT landfill.

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 No. / Notification / Reference No.	Valid Period		Status	Remarks
	From	To		
Chemical Waste Producer Registration				
WPN5113-256-B2597-01	10-Sep-20	--	Valid	--
Billing Account Construction Waste Disposal				
7037500	09-Jun-20	--	Account Active	--
Construction Noise Permit				
GW-RE-081620	25-Sep-20	24-Nov-20	Valid	Piling Works

Permit / License No. / Notification / Reference No.	Valid Period		Status	Remarks
	From	To		
Wastewater Discharge License				
457581	--	--	Under EPD Approval	--
Notification under Air Pollution Control (Construction Dust) Regulation				
456376	21-May-20	--	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:

Air Quality

- Maintain water spraying for active construction area.
- Stockpile should be fully covered while not in use or removed from the site.

Noise Control

- Provide movable noise barrier for piling works.

Temporary Water Drainage System & Water Quality

- The temporary drainage system should be updated with the site condition.
- U-channel should be cleaned regularly.
- Open stockpiles should be fully covered with tarpaulin or similar fabric while not in use to prevent the washing away of materials into any drainage system.
- Drain surface should be covered adequately to prevent silt being washed out into the drainage system.
- Drip tray should be provided for chemical storage area to prevent leakage.

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 3.3	Supplementary Baseline Monitoring Report for AM5A and NM5A	18 September 2020

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 and Noise monitoring in the reporting month.

6.2 Record on Environmental Complaints Received

No environmental complaint was recorded in the reporting month. 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)
- Bored Pile Works
  - Bored Pile Works (Predrilling)
  - Bored Pile Construction
- ELS (Stage 1)
  - Grouting Works

7.2 Key Issues for the Coming Month

Key issues to be considered in the coming month include:

- Update of temporary water drainage system;
- 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 and Limit Levels for 1-hour TSP, 24-hour TSP and noise in the reporting month.

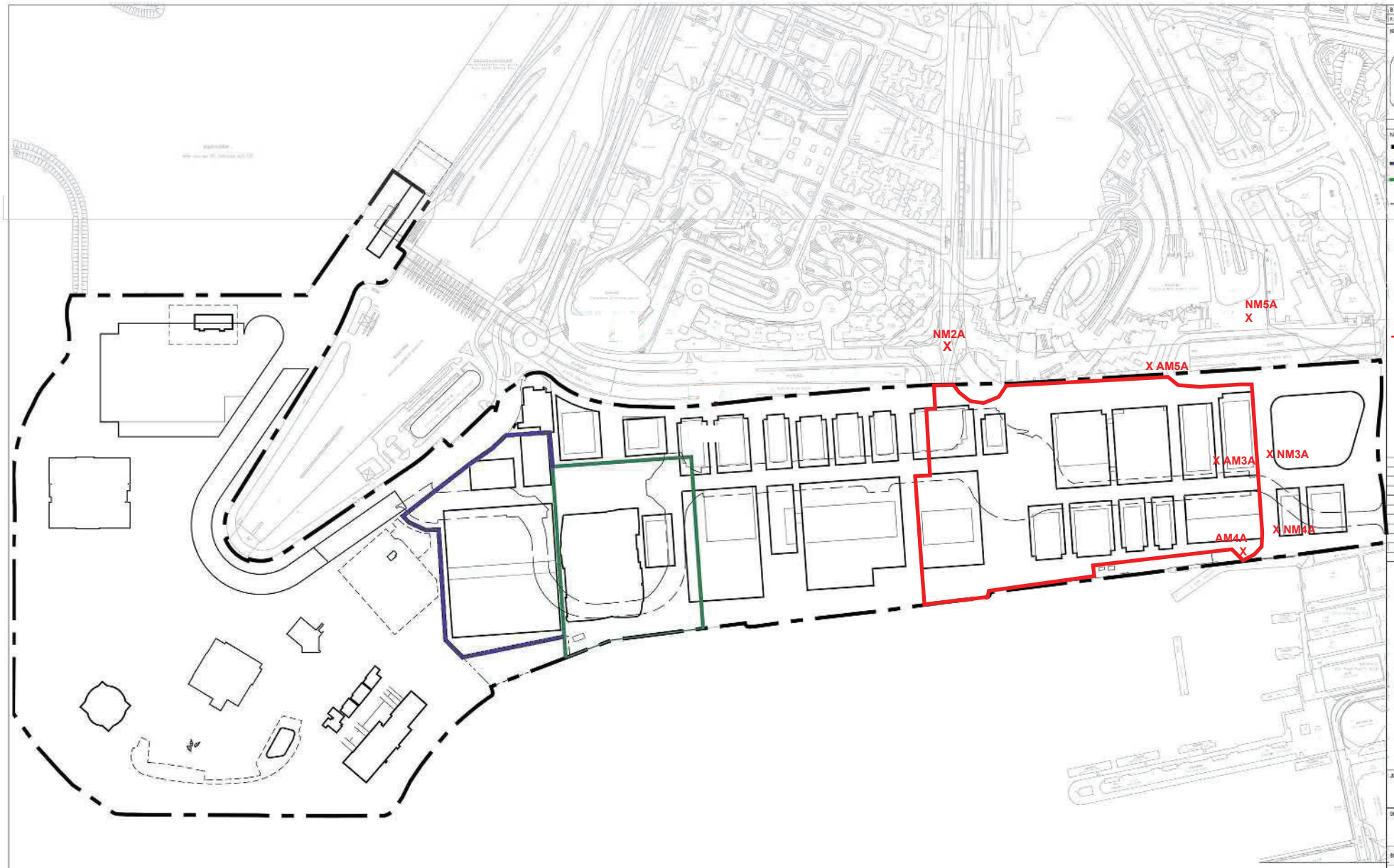
No environmental complaints were recorded in the reporting month. No notifications of summons or successful prosecutions were received during the reporting month.

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



B.D. REF:

H.S.D. REF:

KEY PLAN

KEY PLAN

NOTES:

WKCD BOUNDARY

M+ MUSEUM BOUNDARY

LYRIC THEATRE BOUNDARY

BOUNDARY OF UNDERPASS ROAD SERVING THE PLANNED WKCD

X CONSTRUCTION AIR/NOISE MONITORING STATION

REMARKS:
THE AIR MONITORING STATION AM2A HAS BEEN RELOCATED TO THE ALTERNATIVE MONITORING STATION AM2B AT 1ST FLOOR OF GAMMON'S SITE OFFICE ON 26 FEBRUARY 2019.

Zone 2A Boundary

REV.	DATE	DESCRIPTION	INITIAL

JOB TITLE: **DEVELOPMENT AT WEST KOWLOON CULTURAL DISTRICT**

DRAWING TITLE: **SITE LAYOUT PLAN AND MONITORING STATIONS**

SCALE:	1:100	PRINTED:	A1
CHECKED:		DATE:	
APPROVED:		DATE:	
DRAWN:	TY	DATE:	05-10-2018

CONTRACT NO.: -

DRAWING NO.: **FIGURE 1** REV.: XA

CAD REF NAME: XXXXX-AUT-PMS DWG-P60-L080-0080-XXX.dwg

AUTHORITY:

westKowloon
西九文化區

A1 (841mm x 594mm) Sheet Size

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
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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

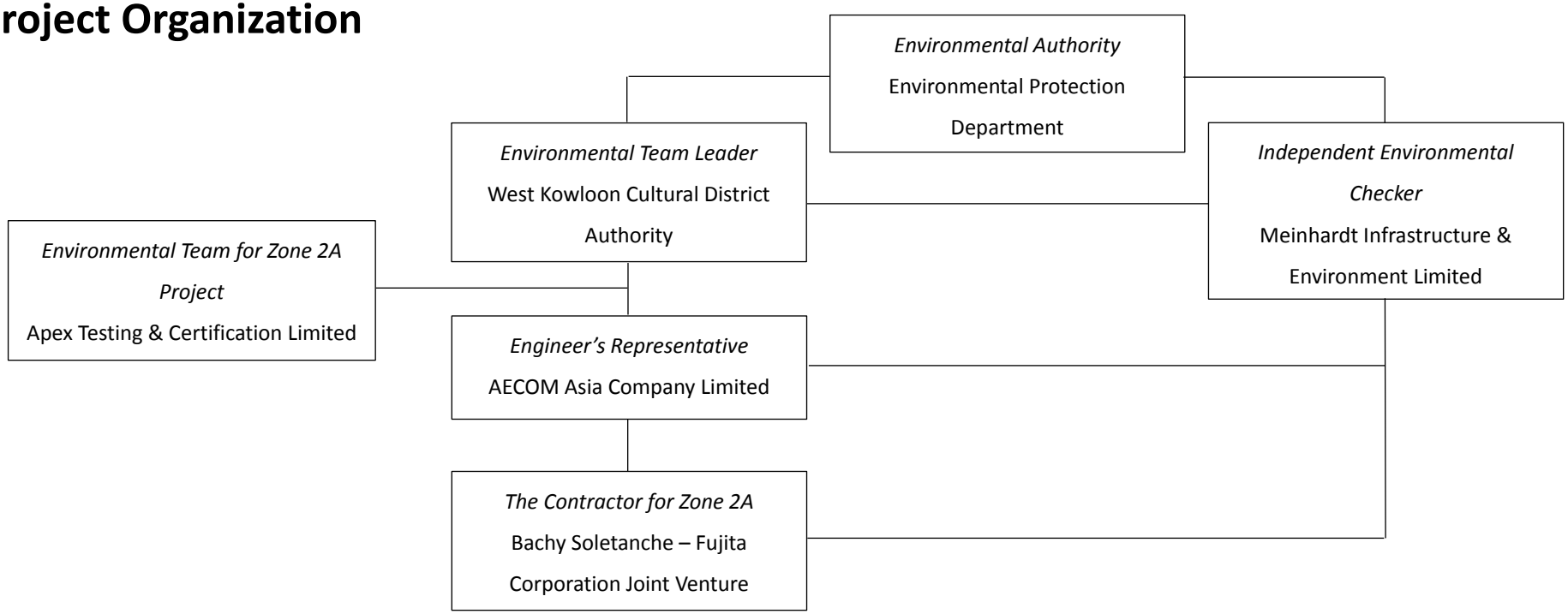


Table A-1: Contract Information

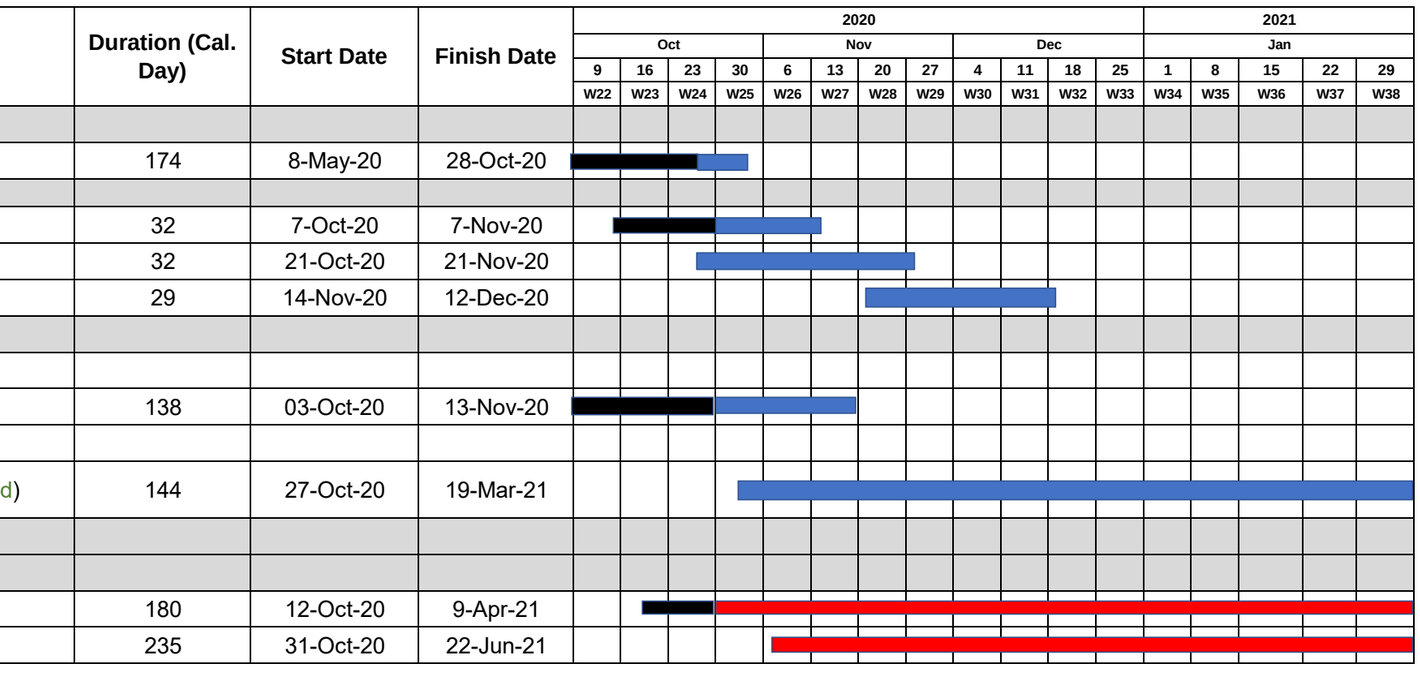
Company Name	Role	Name	Telephone	Email
West Kowloon Cultural District Authority	WKCDA Representative & Project ETL	Mr. C.K. WU	5506 9178	ck.wu@wkcda.hk
Meinhardt Infrastructure & Environment Limited	Independent Environmental Checker	Ms. Claudine LEE	2859 5409	caludinelee@meinhardt.com.hk
AECOM Asia Company 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 Description	Duration (Cal. Day)	Start Date	Finish Date
Preliminaries Works			
Water, Power and Discharge Point Installation	174	8-May-20	28-Oct-20
Grouting Curtain Works (Trial 1 & Trial 2)			
Pipe Pile Construction (Trial 1 and 2) (11/40 Nos. Completed)	32	7-Oct-20	7-Nov-20
Trial Grouting (Trial 1 and 2) - Stage 2 grouting (0/48 Nos. Completed)	32	21-Oct-20	21-Nov-20
Pumping Test (Trial 1 and 2)	29	14-Nov-20	12-Dec-20
Bored Pile Works			
Bored Pile Works (Predrilling)			
Predrill (21/42 Completed)	138	03-Oct-20	13-Nov-20
Bored Pile Construction (Total 32 Nos. 2~4 Workfront)			
BP34G, BP34E, BP35E1, BP32E, BP33F, BP33G, BP32P, BP33M, BP33P (0/32 Completed)	144	27-Oct-20	19-Mar-21
ELS (Stage 1)			
Grouting Works			
Stage 1a & 1b grouting (5/1054 Completed)	180	12-Oct-20	9-Apr-21
Pipe Pile Construction (0/523 Nos Completed)	235	31-Oct-20	22-Jun-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/m3)	Limit Level (µg/m3)
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/m3)	Limit Level (µg/m3)
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	WKCDA	Contractor
Action Level				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and WKCDA; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and WKCDA; 3. Advise the WKCDA on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and WKCDA; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to WKCDA within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Event	Action			
	ET	IEC	WKCDA	Contractor
Limit Level				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform WKCDA, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the WKCDA on the effectiveness of the proposed remedial measures; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	1. Notify IEC, WKCDA, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and WKCDA to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the WKCDA 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	WKCDA	Contractor
Action Level	1. Notify WKCDA, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, WKCDA and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the WKCDA accordingly; 3. Advise the WKCDA on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures.	1. Submit noise mitigation proposals to IEC and WKCDA; 2. Implement noise mitigation proposals.
Limit Level	1. Inform IEC, WKCDA, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and WKCDA on remedial measures required; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 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; 2. Submit proposals for remedial actions to IEC and WKCDA within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; 5. Stop the relevant portion of works as instructed by the WKCDA 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; 2. Prepare and submit report.	1. Check report submitted by ET; 2. Recommend remedial design if necessary.	1. Undertake remedial design if necessary.	-
Non-conformity on one occasion	1. Identify source of non-conformity; 2. Report to IEC and WKCDA; 3. Discuss remedial actions with IEC, WKCDA and Contractor; 4. Monitor remedial actions until rectification has been completed.	1. Check and verify source of non-conformity; 2. Discuss remedial actions with ET and Contractor; 3. Advise WKCDA on effectiveness of proposed remedial actions; 4. Check implementation of remedial actions.	1. Notify Contractor; 2. Ensure remedial actions are properly implemented.	1. Amend working method as necessary; 2. Rectify damage and undertake necessary replacement and remedial actions.
Repeated non-conformity	1. Identify source of non-conformity; 2. Report to IEC and WKCDA; 3. Increase monitoring frequency; 4. Discuss remedial actions with IEC, WKCDA and Contractor; 5. Monitor remedial actions until rectification has been completed; 6. If non-conformity rectified, reduce monitoring frequency back to normal.	1. Check and verify source of non-conformity; 2. Check Contractor's working method; 3. Discuss remedial actions with ET and Contractor; 4. Advise WKCDA on effectiveness of proposed remedial actions; 5. Supervise implementation of remedial actions.	1. Notify Contractor; 2. Ensure remedial actions are properly implemented.	1. Amend working method as necessary; 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

October 2020 (Hong Kong)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
27	28	29	30	1 • National Day of the People's Republic of China	2 • Day after Mid-Autumn Festival	3 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring
4	5	6	7 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring	8	9	10
11	12 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring	13	14	15	16	17 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring
18	19 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring	20	21	22	23	24 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring
25	26 • Chung Yeung Festival	27	28	29	30 AM3A,AM4A,AM5A - 24-hr TSP, 1-hr TSP X 3 NM2A,NM3A,NM4A,NM5A - Noise Impact Monitoring	31

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

November 2020 (Hong Kong)

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

F. Calibration Certifications

TISCH Environmental

RECALIBRATION DUE DATE:
November 8, 2020

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	November 8, 2019	**Rootsmeter S/N:** 438320	**Ta:** 296	°K
Operator:	Jim Tisch		**Pa:** 760.7	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **3543**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4110	3.2	2.00
2	3	4	1	1.0100	6.4	4.00
3	5	6	1	0.8990	7.9	5.00
4	7	8	1	0.8560	8.7	5.50
5	9	10	1	0.7100	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)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
1.0035	0.7112	1.4197	0.9958	0.7057	0.8822
0.9992	0.9894	2.0077	0.9916	0.9818	1.2476
0.9973	1.1093	2.2447	0.9896	1.1008	1.3948
0.9962	1.1638	2.3542	0.9886	1.1549	1.4629
0.9909	1.3956	2.8393	0.9833	1.3849	1.7643
QSTD	**m=**	**2.06886**	**QA**	**m=**	**1.29548**
	b=	**-0.04852**		**b=**	**-0.03015**
	r=	**0.99994**		**r=**	**0.99994**

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

Qa= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg

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

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

TE-5170 Calibration Worksheet

Site Information

Location: AM3A	**Site ID:** Zones 2A at West Kowloon Cultural	**Date:** 16-Sep-20
Sampler: TE-5170	**Serial No:** 4340	**Tech:** CS Tang

Site Conditions

Barometric Pressure (in Hg): 29.86	**Corrected Pressure (mm Hg):** 758
Temperature (deg F): 82	**Temperature (deg K):** 301
Average Press. (in Hg): 29.86	**Corrected Average (mm Hg):** 758
Average Temp. (deg F): 82	**Average Temp. (deg K):** 301

Calibration Orifice

Make: Tisch	**Qstd Slope:** 1.29548
Model: TE-5025A	**Qstd Intercept:** -0.03015
Serial#: 3543	**Date Certified:** 8-Nov-19

Calibration Information

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)
1	12.30	2.714	53.0	52.68
2	10.40	2.498	48.0	47.71
3	7.20	2.082	41.0	40.75
4	4.10	1.577	33.0	32.80
5	2.40	1.212	23.0	22.86

Linear Regression

Slope: 18.9107
Intercept: 1.2274
Corr. Coeff: 0.9953

# of Observations: 5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[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)[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
2.016546576
Average Flow Calculation in CFM
71.2042596
Sample Time (Hrs): 1.0
Total Flow in m3/min
120.9927946
Total Flow in CFM
4272.255576

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 Kowloon Cultural	**Date:** 16-Sep-20
Sampler: TE-5170	**Serial No:** 3998	**Tech:** CS Tang

Site Conditions

Barometric Pressure (in Hg): 29.86	**Corrected Pressure (mm Hg):** 758
Temperature (deg F): 82	**Temperature (deg K):** 301
Average Press. (in Hg): 29.86	**Corrected Average (mm Hg):** 758
Average Temp. (deg F): 82	**Average Temp. (deg K):** 301

Calibration Orifice

Make: Tisch	**Qstd Slope:** 1.29548
Model: TE-5025A	**Qstd Intercept:** -0.03015
Serial#: 3543	**Date Certified:** 8-Nov-19

Calibration Information

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)
1	12.40	2.725	53.0	52.68
2	10.10	2.462	48.0	47.71
3	7.50	2.125	41.0	40.75
4	4.30	1.614	33.0	32.80
5	2.20	1.161	23.0	22.86

Linear Regression

Slope: 18.7248
Intercept: 1.5865
Corr. Coeff: 0.9986

# of Observations: 5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[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)[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
2.017398315
Average Flow Calculation in CFM
71.23433451
Sample Time (Hrs): 1.0
Total Flow in m3/min
121.0438989
Total Flow in CFM
4274.060071

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 Kowloon Cultural	**Date:** 16-Sep-20
Sampler: TE-5170	**Serial No:** 4344	**Tech:** CS Tang

Site Conditions

Barometric Pressure (in Hg): 29.86	**Corrected Pressure (mm Hg):** 758
Temperature (deg F): 82	**Temperature (deg K):** 301
Average Press. (in Hg): 29.86	**Corrected Average (mm Hg):** 758
Average Temp. (deg F): 82	**Average Temp. (deg K):** 301

Calibration Orifice

Make: Tisch	**Qstd Slope:** 1.29548
Model: TE-5025A	**Qstd Intercept:** -0.03015
Serial#: 3543	**Date Certified:** 8-Nov-19

Calibration Information

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)
1	12.20	2.704	53.0	52.70
2	10.30	2.487	48.0	47.73
3	7.20	2.083	41.0	40.77
4	4.10	1.577	33.0	32.81
5	2.30	1.187	23.0	22.87

Linear Regression

Slope: 18.8498
Intercept: 1.5317
Corr. Coeff: 0.9965

# of Observations: 5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
IC = I[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)[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
2.007696665
Average Flow Calculation in CFM
70.89176925
Sample Time (Hrs): 1.0
Total Flow in m3/min
120.4617999
Total Flow in CFM
4253.506155

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

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 the 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 maintained on the IAS website (www.iasonline.org).

This certificate is valid up to December 1, 2020.

(See laboratory's scope of accreditation for fields of calibration and accredited calibration.)

This accreditation certificate supersedes any IAS accreditation bearing an earlier effective date. The certificate becomes invalid upon suspension, cancellation or revocation of accreditation. See www.iasonline.org for current accreditation information, or contact IAS at 562-364-8201.

Raj Nathan
President

18-15965

SCOPE OF ACCREDITATION

CALIBRATION AND MEASUREMENT CAPABILITY (CMC)[1,2]

CALIBRATION AREA	RANGE	EXPANDED UNCERTAINTY[3] (±)	TECHNIQUE, REFERENCE STANDARD, EQUIPMENT
Flow table[4]	15 kg to 17 kg 1 mm up to 71 mm	12 g 600 µm	Weighing Balance, Reference caliper & Reference steel ruler by direct measurement
Test Sieve[4]	4 mm to 50 mm	50 µm	Reference Caliper by direct measurement
Mechanical			
Force Measuring Machine[4] (Compression Mode)	1 kN to 3000 kN	0.4 %	Ref. Load cell by direct measurement BS 1610: Part 1:1985; BS 1610: Part 1:1992; BS EN ISO 12390-4:2000 Annex B; BS EN ISO 7500-1:2004
Laser Dust Meter[4]	Dust particles 0.001 mg/m^3 to 10.00 mg/m^3	0.9 mg/m^3	By comparison method by using reference laser dust meter
Rebound Hammer[4]	80 unit (hardness)	1.6 rebound count	Reference Rebound count by comparison method. BS1881: Part 202:1986; BS EN 12504-2:2001; BS EN 12504-2:2012
Mass (F2 class and coarser)	1 g to 200 g 200 g to 5 kg 5 kg to 10 kg 10 kg to 50 kg	1.3 mg 0.5 g 1 g 7 g	Standard Weight E2/ F1 Class & Weighing Balances by comparison method (OIMLR111)
Weighing Scale & Balance[4]	1 g to 200 g 200 g to 5 kg 5 kg to 50 kg	1 mg 1 g 15 g	Standard weight of E2/F1 Grade by direct measurement
Volumetric Glassware	1 mL to 100 mL 100 mL to 1000 mL	0.004 mL 0.09 mL	Standard weight E2 Class, Weighing Balances & Distilled water by gravimetric method
Thermal			
Digital/Liquid in Glass Thermometers & *RTD*/ Thermocouples with or without Indicators	15 °C to 55°C 55°C to 95°C	0.4 °C 0.9 °C	Water Baths, Reference Sensor and Indictor by Comparison Method (OIML R133)

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

- HOKLAS - Mutual Recognition Arrangements (MRA)
- HKCAS - Multilateral Recognition Arrangements (MLA)
- HKIAS - Mutual Recognition Arrangement (MRA)

HOKLAS - Mutual Recognition Arrangements (MRA)

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.

HKCAS - Multilateral Recognition Arrangements

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) 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

HKIAS - Mutual Recognition Arrangements (MRA)

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

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

Mutual Recognition Arrangement (MRA) Partners for HKIAS

back

Economy	Logo	Name of Partner	URL	Calibration	Testing	ISO 15189 (Medical Testing)	RMP	PTP
Ukraine		National Accreditation Agency of Ukraine (NAAU)	www.naau.org.ua	•	•			
United Arab Emirates		Emirates National Accreditation System (ENAS)	http://www.enas.gov.ae	•	•			
United Arab Emirates		Emirates International Accreditation Center (EIAC)	www.eiac.gov.ae	•	•	•		
United Kingdom of Great Britain and Northern Ireland		United Kingdom Accreditation Service (UKAS)	www.ukas.com	•	•	•		•
United States of America		Perry Johnson Laboratory Accreditation, Inc. (PJLA)	www.pjlabs.com	•	•	•	•	
United States of America		International Accreditation Service Inc. (IAS)	www.iasonline.org	•	•			
United States of America		ANSI-ASQ National Accreditation Board (ANAB)	www.anab.org	•	•	•	•	•
United States of America		American Association for Laboratory Accreditation (A2LA)	www.a2la.org	•	•	•	•	•
United States of America		AIHA Laboratory Accreditation Programs, LLC (AIHA-LAP, LLC)	www.aihaaccreditedlabs.org		•			
United States of America		National Voluntary Laboratory Accreditation Program (NVLAP)	www.nist.gov/nvlap	•	•			
Uruguay		Organismo Uruguayo De Acreditación (OUA)	www.organismouruguayodeacreditacion.org	•	•			

RMP: Reference Material Producer ; PTP: Proficiency Testing Provider

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

IAS ACCREDITED Calibration Laboratory

CERTIFICATE OF CALIBRATION

Report Number : 1911ICA-122F
Date of Report : 22-Nov-19
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/m3
Range : 0.001 to 1 mg/m3
Condition of Item : Normal

Date Item Received : 17-Nov-19
Date Calibrated : 17-Nov-19
Calibration Location : AQuality Calibration Lab.
Date of Next Calibration : 16-Nov-20
Calibrated By : Jessica Liu

Test Environment

Ambient Temperature	:	26.5	°C to	21.4	°C
Relative Humidity	:	66	% to	87	%

Calibration Results

Reference True Reading (mg/m3)	Average IUC Reading (mg/m^3)	Correction (mg/m^3)	Error of IUC Reading (%)	Expanded Uncertainty (mg/m^3)	Coverage Factor K
0.062	0.067	-0.005	7.6	0.082	2.0
0.307	0.305	0.002	-0.7	0.036	2.0
0.546	0.568	-0.022	3.8	0.060	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

The results shown in this certificate are metrologically traceable to the International System of Units (SI) or recognised measurement standards.

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CERTIFICATE OF CALIBRATION

Report Number : 1911ICA-122F
Date of Report : 22-Nov-19

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 capabiliy 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 :

Equipment Number	Certificate Number	Description
CH-LDM-1	HBW201901312	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 -

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

CERTIFICATE OF CALIBRATION

Apex Testing & Certification Ltd. Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK	Test Report No.	1911MCA-133Fa
	Date of Issue	16-Dec-19
	Date of Testing	17-Nov-19
	Page	1 of 1

Item for Calibration

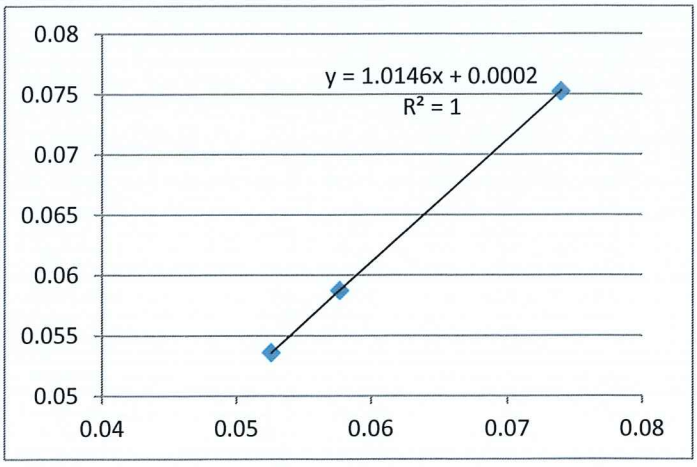
Description : Laser Dust Monitor
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 235811

Standard Equipment

Description : High Volume Sampler / Calibration Orifice
Manufacturer : Tisch Environmental, Inc.
Model No. : TE-5170 / TE-5025A
Serial No. 4344 / 3543
Last Calibration : 17-Nov-19 / 8-Nov-19

Date	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration Standard Equipment (mg/m3)	Concentration Calibrated Equipment (mg/m3)
17-Nov-19	9:30	24.0	1018.1	0.0740	0.0753
17-Nov-19	10:35	24.0	1018.1	0.0526	0.0536
17-Nov-19	11:40	24.0	1018.1	0.0577	0.0587

By Linear Regression of Y or X
Slope (K-factor) : 1.0146
Correlation Coefficient : 1.0000
Validity of Calibration : 16-Nov-20



Remark: : Revised the "Recorded by" & "Checked by" information
: Superseding to Test Report Serial Number 1911MCA-133F

Recorded by : Jessica Liu Signature: Jessica Date: 17-Nov-19

Checked by : S Tang Signature: Tang Date: 17-Nov-19

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IAS ACCREDITED Calibration Laboratory

CERTIFICATE OF CALIBRATION

Report Number : 1911ICA-121F
Date of Report : 22-Nov-19
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/m3
Range : 0.001 to 1 mg/m3
Condition of Item : Normal

Date Item Received : 17-Nov-19
Date Calibrated : 17-Nov-19
Calibration Location : AQuality Calibration Lab.
Date of Next Calibration : 16-Nov-20
Calibrated By : Jessica Liu

Test Environment

Ambient Temperature	:	26.5	°C to	21.4	°C
Relative Humidity	:	66	% to	87	%

Calibration Results

Reference True Reading (mg/m3)	Average IUC Reading (mg/m^3)	Correction (mg/m^3)	Error of IUC Reading (%)	Expanded Uncertainty (mg/m^3)	Coverage Factor K
0.062	0.061	0.001	-2.5	0.120	2.0
0.307	0.306	0.001	-0.4	0.046	2.0
0.546	0.573	-0.027	4.6	0.052	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

The results shown in this certificate are metrologically traceable to the International System of Units (SI) or recognised measurement standards.

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CERTIFICATE OF CALIBRATION

Report Number : 1911ICA-121F
Date of Report : 22-Nov-19

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 capabiliy 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 :

Equipment Number	Certificate Number	Description
CH-LDM-1	HBW201901312	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 -

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CERTIFICATE OF CALIBRATION

Apex Testing & Certification Ltd. Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK	Test Report No.	1911MCA-132Fa
	Date of Issue	16-Dec-19
	Date of Testing	17-Nov-19
	Page	1 of 1

Item for Calibration

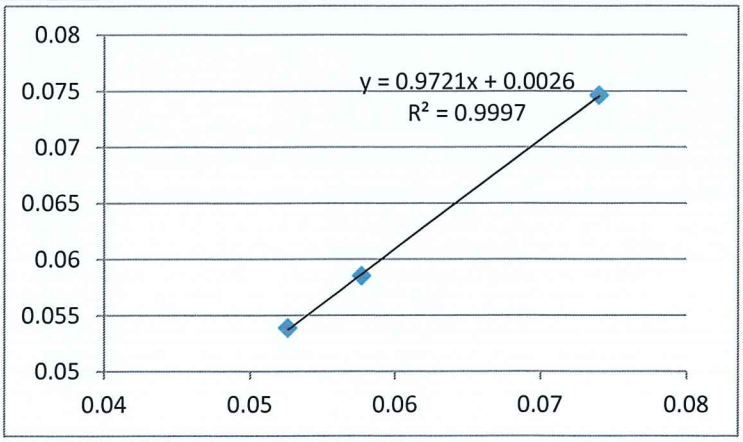
Description : Laser Dust Monitor
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 336338

Standard Equipment

Description : High Volume Sampler / Calibration Orifice
Manufacturer : Tisch Environmental, Inc.
Model No. : TE-5170 / TE-5025A
Serial No. 4344 / 3543
Last Calibration : 17-Nov-19 / 8-Nov-19

Date	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration Standard Equipment (mg/m3)	Concentration Calibrated Equipment (mg/m3)
17-Nov-19	9:30	24.0	1018.1	0.0740	0.0746
17-Nov-19	10:35	24.0	1018.1	0.0526	0.0539
17-Nov-19	11:40	24.0	1018.1	0.0577	0.0585

By Linear Regression of Y or X
Slope (K-factor) : 0.9721
Correlation Coefficient : 0.9997
Validity of Calibration : 16-Nov-20



Remark: : Revised the "Recorded by" & "Checked by" information
: Superseding to Test Report Serial Number 1911MCA-114F

Recorded by : Jessica Liu Signature: Jessica Date: 17-Nov-19

Checked by : S Tang Signature: Tang Date: 17-Nov-19

AQuality 東恒測試顧問有限公司
AQUALITY TESTCONSULT LIMITED
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IAS ACCREDITED Calibration Laboratory

CERTIFICATE OF CALIBRATION

Report Number : 1911ICA-121F
Date of Report : 22-Nov-19
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/m3
Range : 0.001 to 1 mg/m3
Condition of Item : Normal

Date Item Received : 17-Nov-19
Date Calibrated : 17-Nov-19
Calibration Location : AQuality Calibration Lab.
Date of Next Calibration : 16-Nov-20
Calibrated By : Jessica Liu

Test Environment
Ambient Temperature : 26.5 °C to 21.4 °C
Relative Humidity : 66 % to 87 %

Calibration Results

Reference True Reading (mg/m3)	Average IUC Reading (mg/m^3)	Correction (mg/m^3)	Error of IUC Reading (%)	Expanded Uncertainty (mg/m^3)	Coverage Factor K
0.062	0.059	0.003	-5.6	0.124	2.0
0.307	0.307	0.001	-0.3	0.044	2.0
0.546	0.582	-0.035	6.0	0.051	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

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CERTIFICATE OF CALIBRATION

Report Number : 1911ICA-121F
Date of Report : 22-Nov-19

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 capabiliy 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 :

Equipment Number	Certificate Number	Description
CH-LDM-1	HBW201901312	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 -

AQuality
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CERTIFICATE OF CALIBRATION

Apex Testing & Certification Ltd. Unit D6A, 10/F, TML Tower, 3 Hoi Shing Road, Tsuen Wan, N.T., HK	Test Report No.	1911MCA-132Fa
	Date of Issue	16-Dec-19
	Date of Testing	17-Nov-19
	Page	1 of 1

Item for Calibration

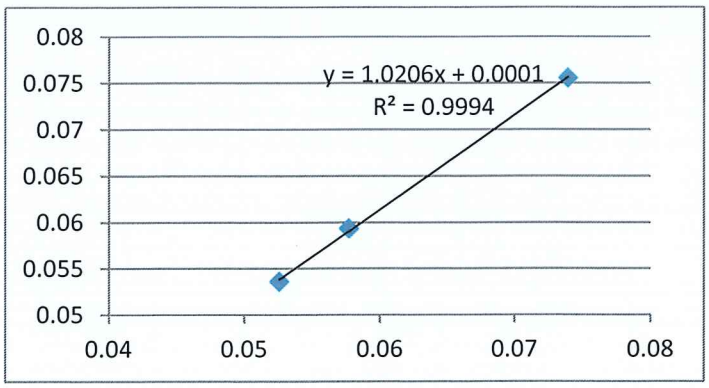
Description : Laser Dust Monitor
Manufacturer : Sibata Scientific Technology Ltd
Model No. : LD-3B
Serial No. : 567188

Standard Equipment

Description : High Volume Sampler / Calibration Orifice
Manufacturer : Tisch Environmental, Inc.
Model No. : TE-5170 / TE-5025A
Serial No. 4344 / 3543
Last Calibration : 17-Nov-19 / 8-Nov-19

Date	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration Standard Equipment (mg/m3)	Concentration Calibrated Equipment (mg/m3)
17-Nov-19	9:30	24.0	1018.1	0.0740	0.0756
17-Nov-19	10:35	24.0	1018.1	0.0526	0.0536
17-Nov-19	11:40	24.0	1018.1	0.0577	0.0593

By Linear Regression of Y or X
Slope (K-factor) : 1.0206
Correlation Coefficient : 0.9994
Validity of Calibration : 16-Nov-20



Remark: : Revised the "Recorded by" & "Checked by" information
: Superseding to Test Report Serial Number 1911MCA-132F

Recorded by : Jessica Liu Signature: Jessica Date: 17-Nov-19

Checked by : S Tang Signature: S Tang Date: 17-Nov-19

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
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CERTIFICATE OF CALIBRATION

Certificate No.: 20CA0408 04-02

Item tested

Description:	Sound Level Meter (Class 1)	,	Microphone
Manufacturer:	Hangzhou Aihua Instruments Co., Ltd	,	-
Type/Model No.:	AWA5661	,	AWA14425
Serial/Equipment No.:	304723	,	9792
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:	08-Apr-2020

Date of test: 10-Apr-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-2020	CIGISMEC
Signal generator	DS 360	33873	10-May-2020	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1000 ± 5 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.

2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.

3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure 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:** 14-Apr-2020 **Company Chop:** SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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.

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CERTIFICATE OF CALIBRATION

(Continuation Page)

1, Electrical Tests

The electrical tests were perfomed 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	
	C	Pass	0.8	2.1
	Lin	Pass	1.6	2.2
Linearity range for Leq	At reference range , Step 5 dB at 4 kHz	Pass	0.3	
	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	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
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 $1/10^3$ at 4kHz	Pass	0.3	
	1 ms burst duty factor $1/10^4$ 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: 10-Apr-2020

Checked by: Shek Kwong Tat
Date: 14-Apr-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.

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SMECLab

Test Data for Sound Level Meter

Sound level meter type:	AWA5661	Serial No.	304723	Date	10-Apr-2020
Microphone type:	AWA14425	Serial No.	9792	Report:	20CA0408 04-02

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	12.1	dB
Noise level in C weighting	12.4	dB
Noise level in Lin	21.1	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	54.0	54.0	0.7	0.0	0.0
49.0	48.9	48.9	0.7	-0.1	-0.1
44.0	43.9	43.9	0.7	-0.1	-0.1
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	28.9	28.9	0.7	-0.1	-0.1
28.0	28.0	28.0	0.7	0.0	0.0

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SMECLab

Test Data for Sound Level Meter

Sound level meter type: AWA5661 Serial No. 304723 Date 10-Apr-2020
Microphone type: AWA14425 Serial No. 9792
Report: 20CA0408 04-02

27.0	27.1	27.1	0.7	0.1	0.1
26.0	26.2	26.2	0.7	0.2	0.2
25.0	25.1	25.1	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
25-120	94.0	94.0	0.7	0.0
45-140	94.0	94.0	0.7	0.0

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
25-120	27.0	27.0	0.7	0.0
	118.0	117.9	0.7	-0.1
45-140	47.0	46.8	0.7	-0.2
	138.0	137.8	0.7	-0.2

FREQUENCY WEIGHTING TEST

The frequency response of the weighting netwoks 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	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	95.2	1.0	1.0	0.2
7943.0	94.0	92.9	93.5	1.5	3.0	0.6
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

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SMECLab

Test Data for Sound Level Meter

Sound level meter type: AWA5661 Serial No. 304723 Date 10-Apr-2020
Microphone type: AWA14425 Serial No. 9792
Report: 20CA0408 04-02

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	93.8	94.0	1.0	1.0	0.2
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	93.9	1.0	1.0	-0.1
251.2	94.0	94.0	93.9	1.0	1.0	-0.1
501.2	94.0	94.0	93.9	1.0	1.0	-0.1
1995.0	94.0	94.0	93.9	1.0	1.0	-0.1
3981.0	94.0	94.0	93.9	1.0	1.0	-0.1
7943.0	94.0	94.0	93.9	1.5	3.0	-0.1
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	115.0	1.0	1.0	0.0

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

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SMECLab

Test Data for Sound Level Meter

Sound level meter type: AWA5661 Serial No. 304723 Date 10-Apr-2020
Microphone type: AWA14425 Serial No. 9792
Report: 20CA0408 04-02

dB	dB	dB	+/- dB	dB
119.0	119.0	119.5	2.0	0.5

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 wighting	dB	dB	indication(dB)	+/- dB	dB
Slow	116.0+6.6	116.0	115.7	0.5	-0.3

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	79.8	1.0	-0.2	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

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SMECLab

Test Data for Sound Level Meter

Sound level meter type:	AWA5661	Serial No.	304723	Date	10-Apr-2020
Microphone type:	AWA14425	Serial No.	9792		

Report: 20CA0408 04-02

Test frequency: 4000 Hz
Integration time: 10 sec

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	59.8	1.7	-0.2

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
115.8	114.8	111.8	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	80.8	2.2	-0.2

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	78.1	1.0	1.0	0.2
8000	92.9	93.4	1.5	3.0	0.5

----------END----------

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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 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1005 ± 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 conditon of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

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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.

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty 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.

- End -

Calibrated by: Fung Chi Yip **Date:** 20-Jun-2020

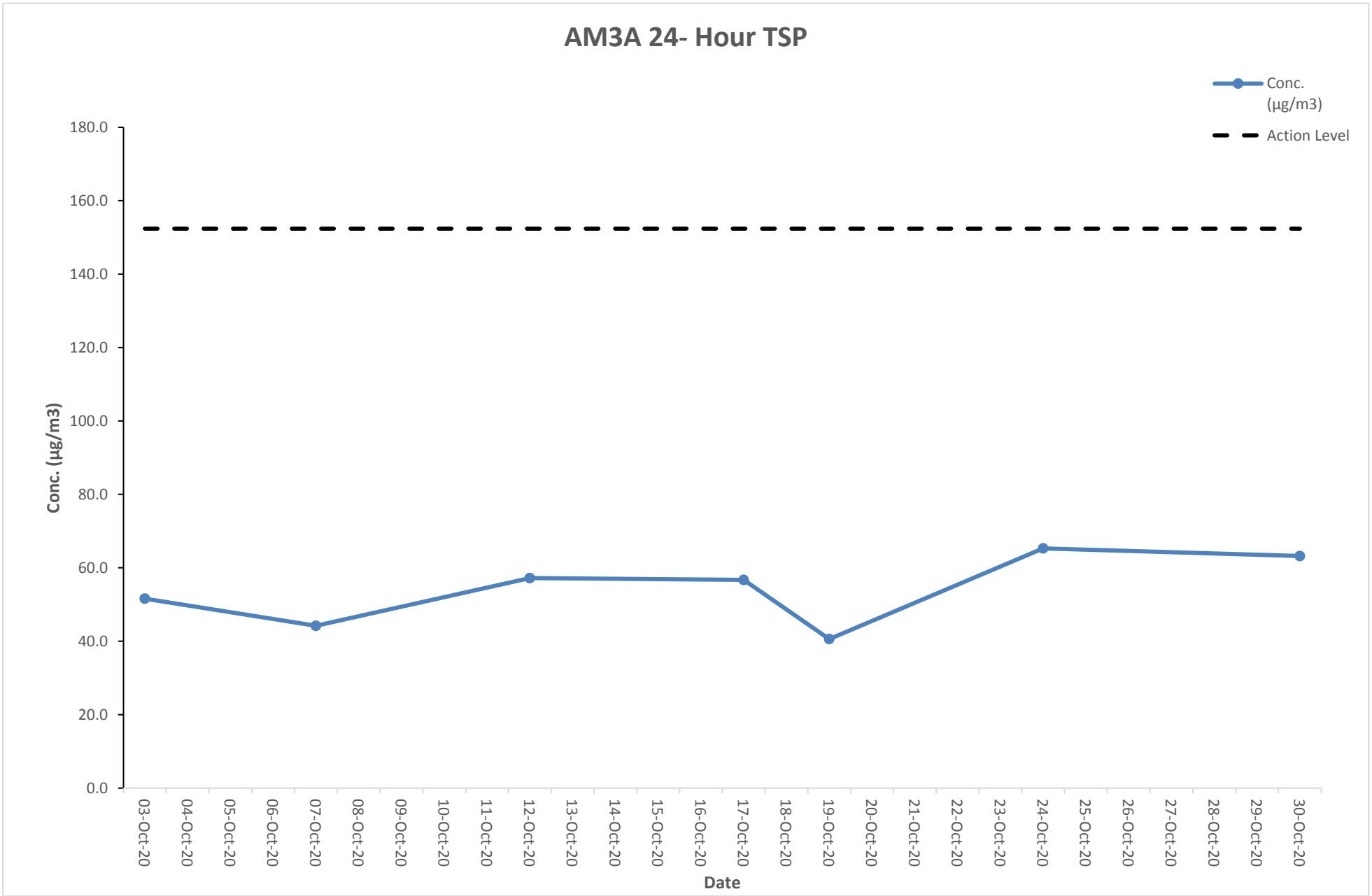
Checked by: Shek Kwong Tat **Date:** 22-Jun-2020

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

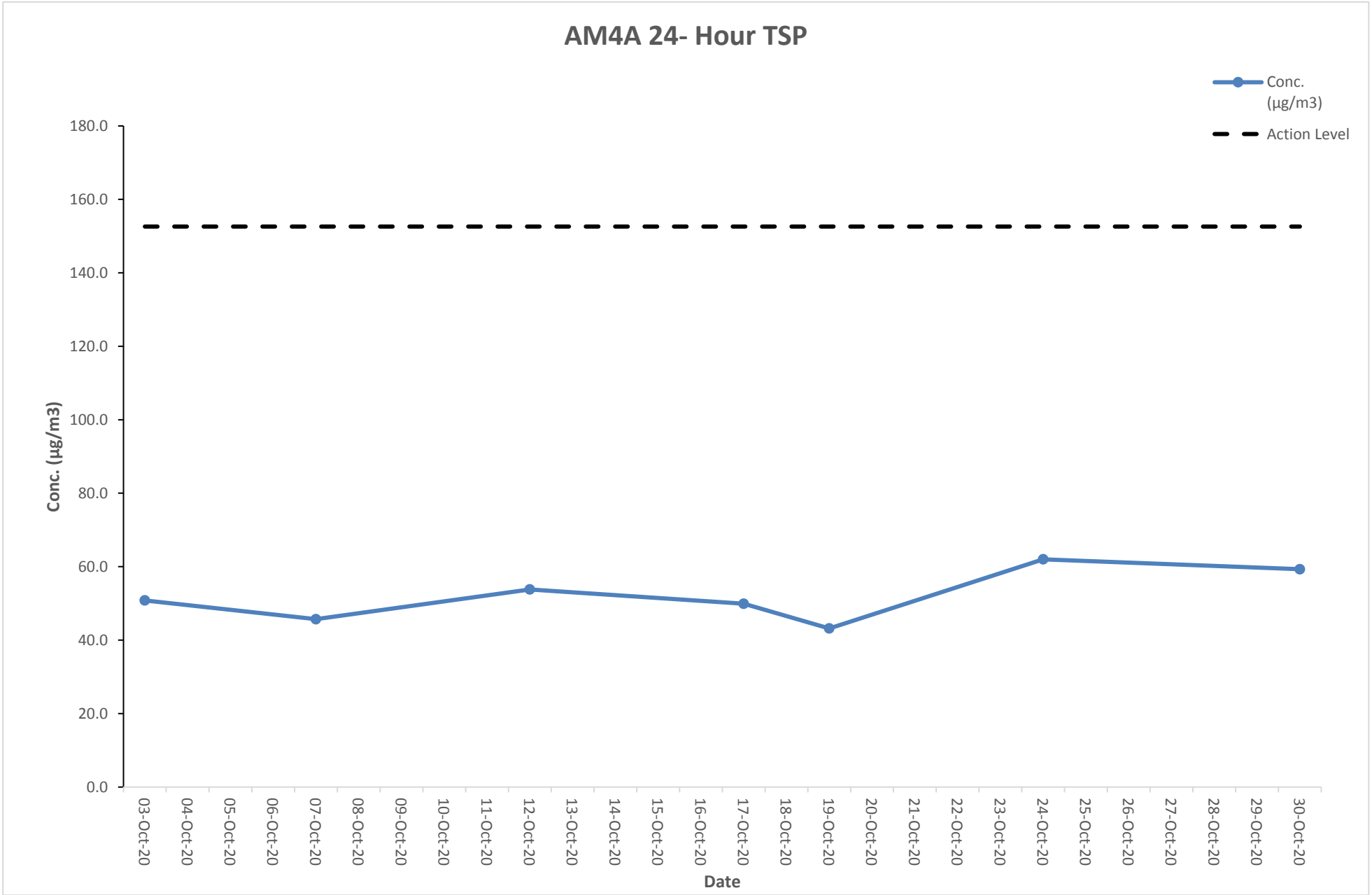
Air Quality Monitoring Result at Station AM3A (24-hour TSP)

Start		Finish		Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m^3/min)			Conc. (µg/m3)	Weather Condition	Action Level	Limit Level
Date	Time	Date	Time	Initial	Final	Initial	Final		Initial	Final	Average				
03-Oct-20	10:00AM	04-Oct-20	10:00AM	2.8030	2.8860	1179.8	1203.8	24	1.12	1.12	1.12	51.6	Fine	152.4	260
07-Oct-20	10:00AM	08-Oct-20	10:00AM	2.8011	2.8722	1203.8	1227.8	24	1.12	1.12	1.12	44.2	Fine	152.4	260
12-Oct-20	10:00AM	13-Oct-20	10:00AM	2.8059	2.8980	1227.8	1251.8	24	1.12	1.12	1.12	57.2	Fine	152.4	260
17-Oct-20	10:00AM	18-Oct-20	10:00AM	2.8043	2.8956	1251.8	1275.8	24	1.12	1.12	1.12	56.7	Cloudy	152.4	260
19-Oct-20	10:00AM	20-Oct-20	10:00AM	2.8070	2.8724	1275.8	1299.8	24	1.12	1.12	1.12	40.6	Fine	152.4	260
24-Oct-20	10:00AM	25-Oct-20	10:00AM	2.8077	2.9127	1299.8	1323.8	24	1.12	1.12	1.12	65.3	Fine	152.4	260
30-Oct-20	10:00AM	31-Oct-20	10:00AM	2.8047	2.9064	1323.8	1347.8	24	1.12	1.12	1.12	63.2	Fine	152.4	260


AM3A 24- Hour TSP
Conc. (µg/m3)
Action Level
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Conc. (µg/m3)
03-Oct-20
04-Oct-20
05-Oct-20
06-Oct-20
07-Oct-20
08-Oct-20
09-Oct-20
10-Oct-20
11-Oct-20
12-Oct-20
13-Oct-20
14-Oct-20
15-Oct-20
16-Oct-20
17-Oct-20
18-Oct-20
19-Oct-20
20-Oct-20
21-Oct-20
22-Oct-20
23-Oct-20
24-Oct-20
25-Oct-20
26-Oct-20
27-Oct-20
28-Oct-20
29-Oct-20
30-Oct-20
Date

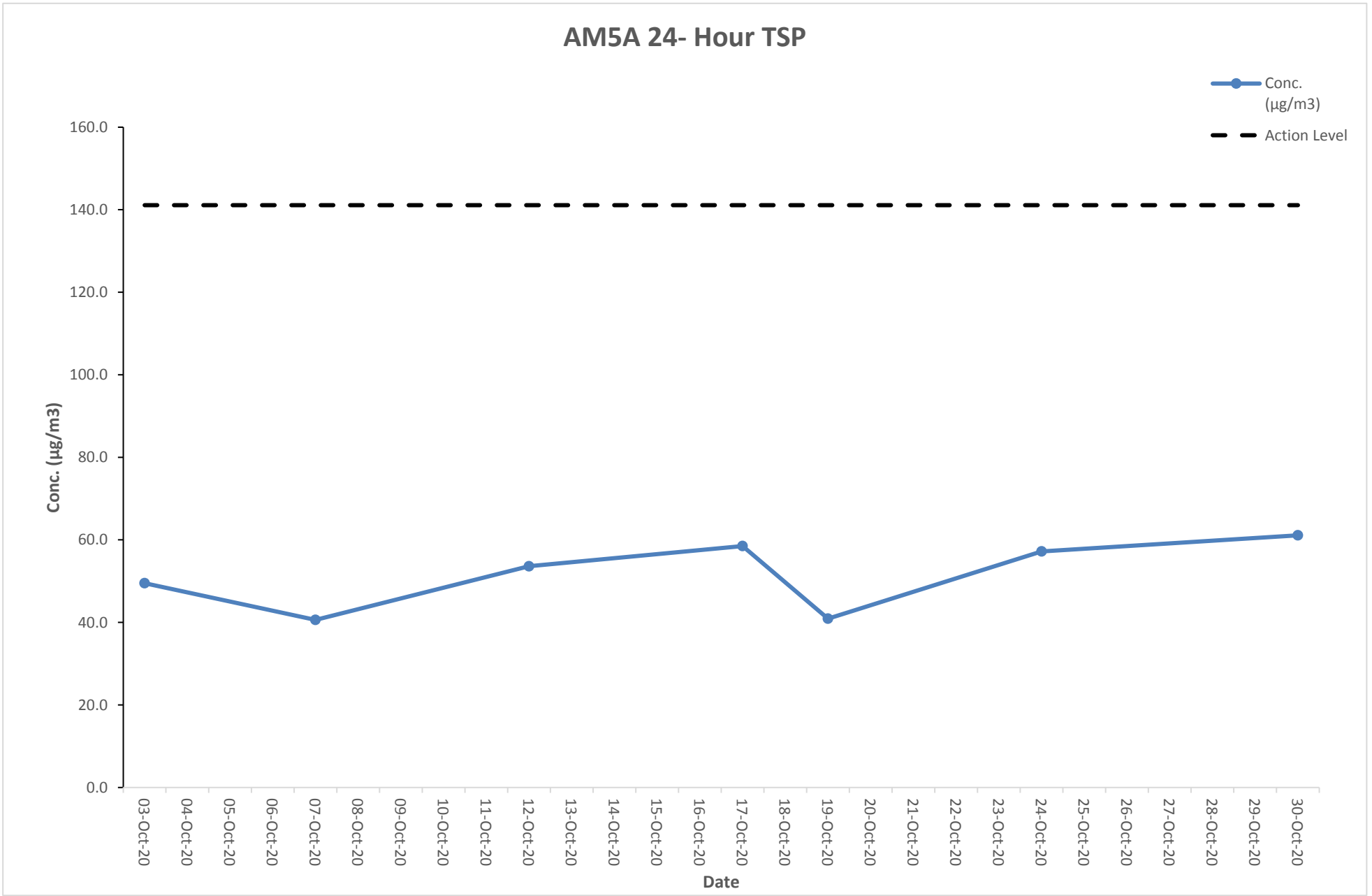
Air Quality Monitoring Result at Station AM4A (24-hour TSP)

Start		Finish		Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m^3/min)			Conc. (µg/m3)	Weather Condition	Action Level	Limit Level
Date	Time	Date	Time	Initial	Final	Initial	Final		Initial	Final	Average				
03-Oct-20	10:00AM	04-Oct-20	10:00AM	2.8088	2.8905	1399.4	1423.4	24	1.12	1.12	1.12	50.8	Fine	152.6	260
07-Oct-20	10:00AM	08-Oct-20	10:00AM	2.8031	2.8767	1423.4	1447.4	24	1.12	1.12	1.12	45.7	Fine	152.6	260
12-Oct-20	10:00AM	13-Oct-20	10:00AM	2.8027	2.8892	1447.4	1471.4	24	1.12	1.12	1.12	53.8	Fine	152.6	260
17-Oct-20	10:00AM	18-Oct-20	10:00AM	2.8039	2.8843	1471.4	1495.4	24	1.12	1.12	1.12	49.9	Cloudy	152.6	260
19-Oct-20	10:00AM	20-Oct-20	10:00AM	2.8066	2.8761	1495.4	1519.4	24	1.12	1.12	1.12	43.2	Fine	152.6	260
24-Oct-20	10:00AM	25-Oct-20	10:00AM	2.8062	2.9061	1519.4	1543.4	24	1.12	1.12	1.12	62.0	Fine	152.6	260
30-Oct-20	10:00AM	31-Oct-20	10:00AM	2.8035	2.8990	1543.4	1567.4	24	1.12	1.12	1.12	59.3	Fine	152.6	260


AM4A 24- Hour TSP
Conc. (µg/m3)
Action Level
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Conc. (µg/m3)
03-Oct-20
04-Oct-20
05-Oct-20
06-Oct-20
07-Oct-20
08-Oct-20
09-Oct-20
10-Oct-20
11-Oct-20
12-Oct-20
13-Oct-20
14-Oct-20
15-Oct-20
16-Oct-20
17-Oct-20
18-Oct-20
19-Oct-20
20-Oct-20
21-Oct-20
22-Oct-20
23-Oct-20
24-Oct-20
25-Oct-20
26-Oct-20
27-Oct-20
28-Oct-20
29-Oct-20
30-Oct-20
Date

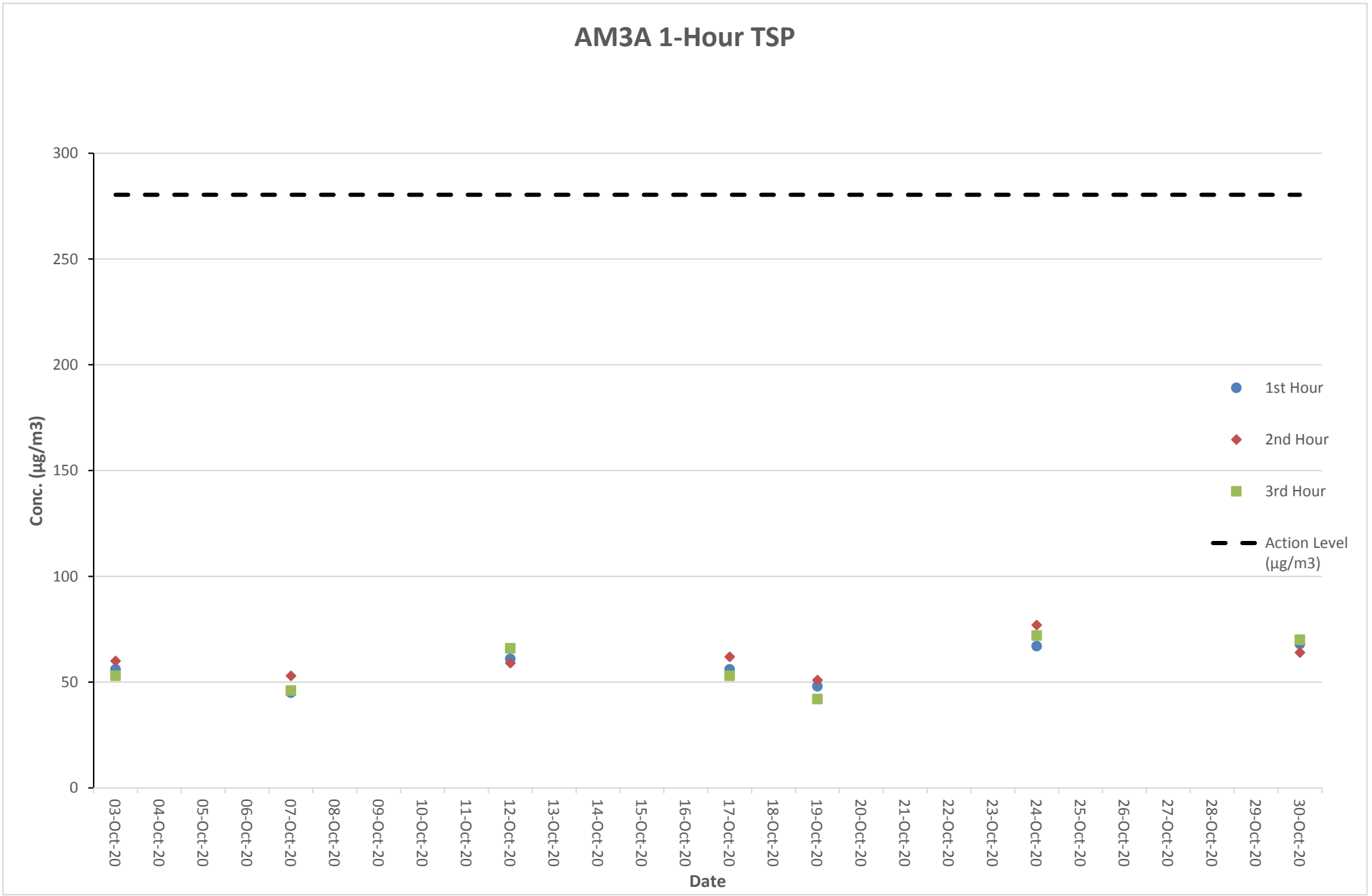
Air Quality Monitoring Result at Station AM5A (24-hour TSP)

Start		Finish		Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m^3/min)			Conc. (µg/m3)	Weather Condition	Action Level	Limit Level
Date	Time	Date	Time	Initial	Final	Initial	Final		Initial	Final	Average				
03-Oct-20	10:00AM	04-Oct-20	10:00AM	2.8068	2.8865	1539.6	1563.6	24	1.12	1.12	1.12	49.5	Fine	141.1	260
07-Oct-20	10:00AM	08-Oct-20	10:00AM	2.8048	2.8702	1563.6	1587.6	24	1.12	1.12	1.12	40.6	Fine	141.1	260
12-Oct-20	10:00AM	13-Oct-20	10:00AM	2.8082	2.8945	1587.6	1611.6	24	1.12	1.12	1.12	53.6	Fine	141.1	260
17-Oct-20	10:00AM	18-Oct-20	10:00AM	2.8035	2.8977	1611.6	1635.6	24	1.12	1.12	1.12	58.5	Cloudy	141.1	260
19-Oct-20	10:00AM	20-Oct-20	10:00AM	2.8020	2.8679	1635.6	1659.6	24	1.12	1.12	1.12	40.9	Fine	141.1	260
24-Oct-20	10:00AM	25-Oct-20	10:00AM	2.8030	2.8950	1659.6	1683.6	24	1.12	1.12	1.12	57.2	Fine	141.1	260
30-Oct-20	10:00AM	31-Oct-20	10:00AM	2.8041	2.9024	1683.6	1707.6	24	1.12	1.12	1.12	61.1	Fine	141.1	260


AM5A 24- Hour TSP
Conc. (µg/m3)
Action Level
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Conc. (µg/m3)
03-Oct-20
04-Oct-20
05-Oct-20
06-Oct-20
07-Oct-20
08-Oct-20
09-Oct-20
10-Oct-20
11-Oct-20
12-Oct-20
13-Oct-20
14-Oct-20
15-Oct-20
16-Oct-20
17-Oct-20
18-Oct-20
19-Oct-20
20-Oct-20
21-Oct-20
22-Oct-20
23-Oct-20
24-Oct-20
25-Oct-20
26-Oct-20
27-Oct-20
28-Oct-20
29-Oct-20
30-Oct-20
Date

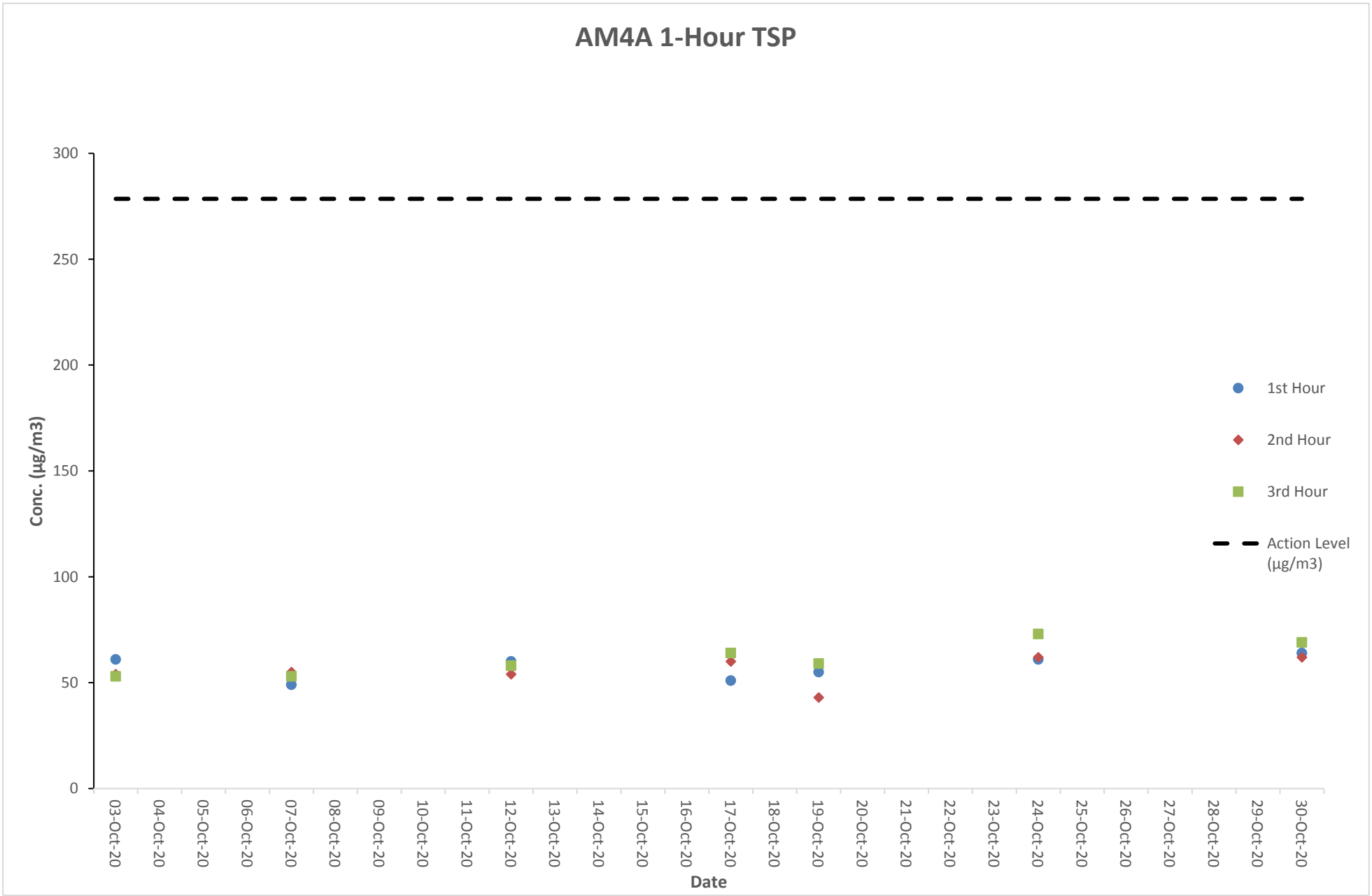
Air Quality Monitoring Result at Station AM3A (1-hour TSP)

Date	Weather Condition	Time		Conc. (μg/m3)			Action Level	Limit Level
		Start	Finish	1st Hour	2nd Hour	3rd Hour		
03-Oct-20	Fine	8:06	11:06	56	60	53	280.4	500
07-Oct-20	Fine	14:09	17:09	45	53	46	280.4	500
12-Oct-20	Cloudy	8:13	11:13	61	59	66	280.4	500
17-Oct-20	Cloudy	14:17	17:17	56	62	53	280.4	500
19-Oct-20	Fine	8:04	11:04	48	51	42	280.4	500
24-Oct-20	Cloudy	14:12	17:12	67	77	72	280.4	500
30-Oct-20	Cloudy	8:18	11:18	68	64	70	280.4	500


AM3A 1-Hour TSP
300
250
200
150
100
50
0
Conc. (µg/m3)
1st Hour
2nd Hour
3rd Hour
Action Level (µg/m3)
03-Oct-20
04-Oct-20
05-Oct-20
06-Oct-20
07-Oct-20
08-Oct-20
09-Oct-20
10-Oct-20
11-Oct-20
12-Oct-20
13-Oct-20
14-Oct-20
15-Oct-20
16-Oct-20
17-Oct-20
18-Oct-20
19-Oct-20
20-Oct-20
21-Oct-20
22-Oct-20
23-Oct-20
24-Oct-20
25-Oct-20
26-Oct-20
27-Oct-20
28-Oct-20
29-Oct-20
30-Oct-20
Date

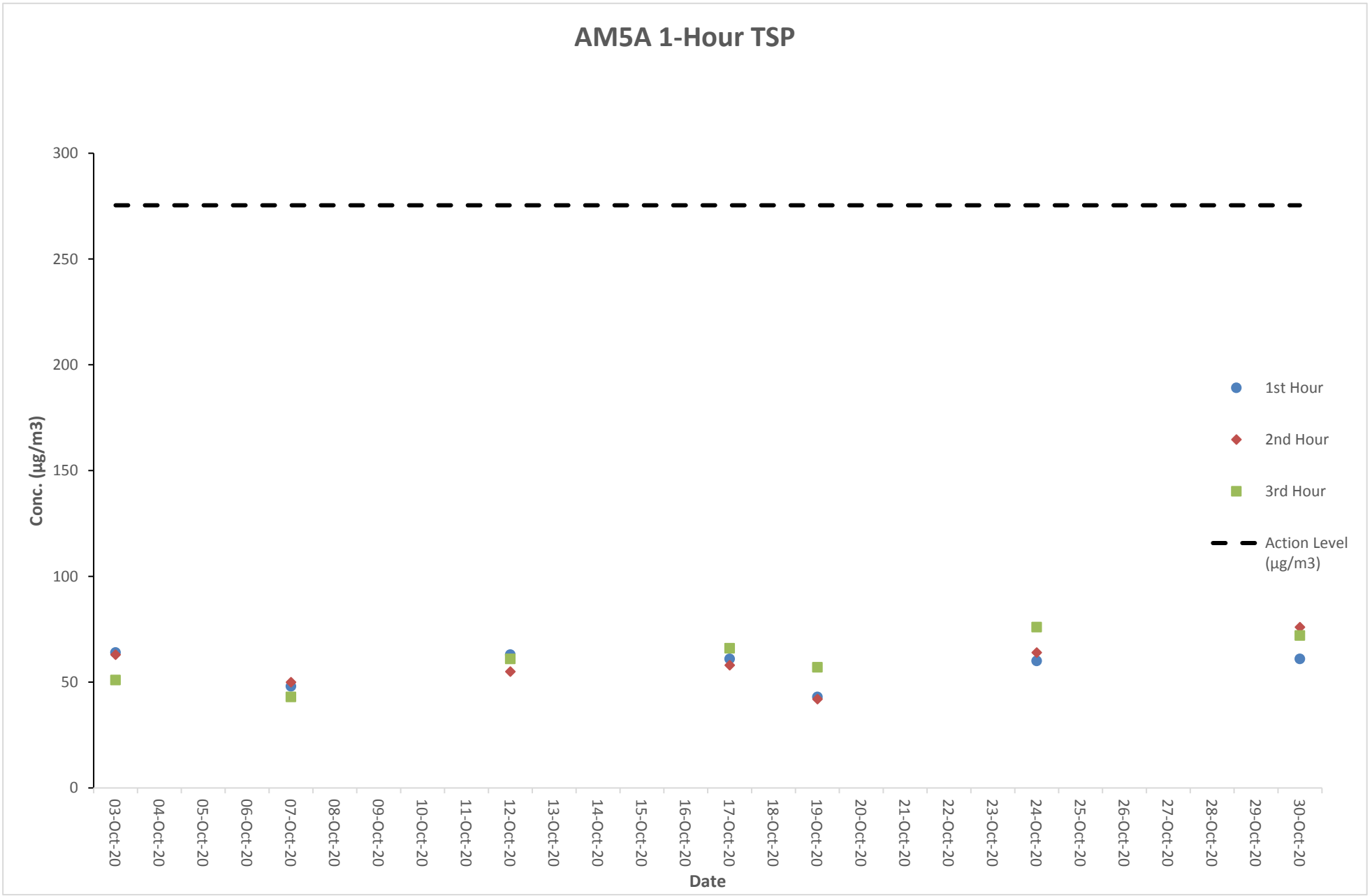
Air Quality Monitoring Result at Station AM4A (1-hour TSP)

Date	Weather Condition	Time		Conc. (μg/m3)			Action Level	Limit Level
		Start	Finish	1st Hour	2nd Hour	3rd Hour		
03-Oct-20	Fine	8:14	11:14	61	54	53	278.5	500
07-Oct-20	Fine	14:17	17:17	49	55	53	278.5	500
12-Oct-20	Cloudy	8:21	11:21	60	54	58	278.5	500
17-Oct-20	Cloudy	14:25	17:25	51	60	64	278.5	500
19-Oct-20	Fine	8:12	11:12	55	43	59	278.5	500
24-Oct-20	Cloudy	14:20	17:20	61	62	73	278.5	500
30-Oct-20	Cloudy	8:26	11:26	64	62	69	278.5	500


AM4A 1-Hour TSP
300
250
200
150
100
50
0
Conc. (µg/m3)
03-Oct-20
04-Oct-20
05-Oct-20
06-Oct-20
07-Oct-20
08-Oct-20
09-Oct-20
10-Oct-20
11-Oct-20
12-Oct-20
13-Oct-20
14-Oct-20
15-Oct-20
16-Oct-20
17-Oct-20
18-Oct-20
19-Oct-20
20-Oct-20
21-Oct-20
22-Oct-20
23-Oct-20
24-Oct-20
25-Oct-20
26-Oct-20
27-Oct-20
28-Oct-20
29-Oct-20
30-Oct-20
Date
1st Hour
2nd Hour
3rd Hour
Action Level (µg/m3)

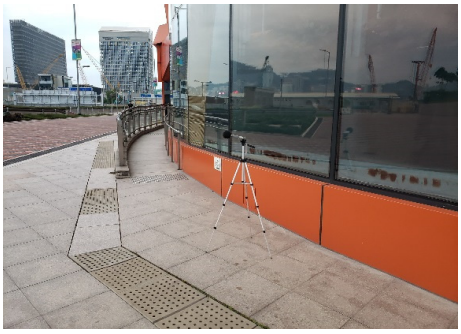
Air Quality Monitoring Result at Station AM5A (1-hour TSP)

Date	Weather Condition	Time		Conc. (μg/m3)			Action Level	Limit Level
		Start	Finish	1st Hour	2nd Hour	3rd Hour		
03-Oct-20	Fine	8:29	11:29	64	63	51	275.4	500
07-Oct-20	Fine	14:34	17:34	48	50	43	275.4	500
12-Oct-20	Cloudy	8:36	11:36	63	55	61	275.4	500
17-Oct-20	Cloudy	14:42	17:42	61	58	66	275.4	500
19-Oct-20	Fine	8:27	11:27	43	42	57	275.4	500
24-Oct-20	Cloudy	14:37	17:37	60	64	76	275.4	500
30-Oct-20	Cloudy	8:41	11:41	61	76	72	275.4	500

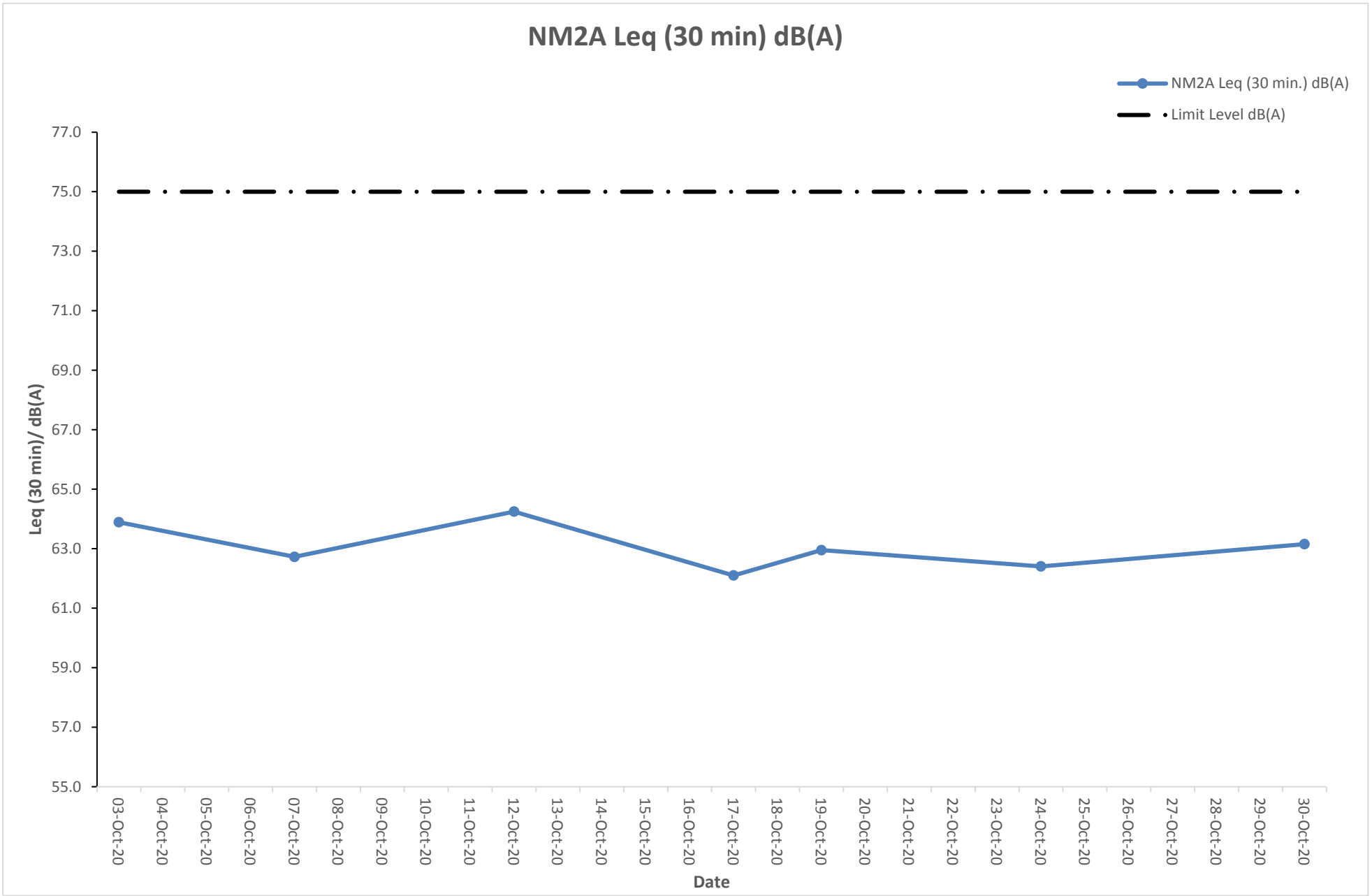

AM5A 1-Hour TSP
300
250
200
150
100
50
0
Conc. (µg/m3)
03-Oct-20
04-Oct-20
05-Oct-20
06-Oct-20
07-Oct-20
08-Oct-20
09-Oct-20
10-Oct-20
11-Oct-20
12-Oct-20
13-Oct-20
14-Oct-20
15-Oct-20
16-Oct-20
17-Oct-20
18-Oct-20
19-Oct-20
20-Oct-20
21-Oct-20
22-Oct-20
23-Oct-20
24-Oct-20
25-Oct-20
26-Oct-20
27-Oct-20
28-Oct-20
29-Oct-20
30-Oct-20
Date
1st Hour
2nd Hour
3rd Hour
Action Level (µg/m3)

Noise Monitoring Result at Station NM2A

Date	Time	Measured L10 dB(A)	Measured L90 dB(A)	Leq (30 min.) dB(A)
03-Oct-20	8:06	65.4	62.5	63.9
03-Oct-20	8:11	65.4	60.2	
03-Oct-20	8:16	64.2	57.6	
03-Oct-20	8:21	65.6	62.4	
03-Oct-20	8:26	65.6	62.3	
03-Oct-20	8:31	65.3	62.4	
07-Oct-20	14:09	65.6	60.1	62.7
07-Oct-20	14:14	64.3	57.6	
07-Oct-20	14:19	64.5	57.4	
07-Oct-20	14:24	64.3	57.5	
07-Oct-20	14:29	65.6	60.5	
07-Oct-20	14:34	64.6	57.5	
12-Oct-20	8:13	64.3	59.3	64.2
12-Oct-20	8:18	65.7	61.4	
12-Oct-20	8:23	65.1	58.6	
12-Oct-20	8:28	64.9	60.1	
12-Oct-20	8:33	65.5	62.5	
12-Oct-20	8:38	65.9	61.6	
17-Oct-20	14:17	63.5	58.2	62.1
17-Oct-20	14:22	65.2	57.6	
17-Oct-20	14:27	64.4	58.5	
17-Oct-20	14:32	64.7	59.3	
17-Oct-20	14:37	63.9	59.7	
17-Oct-20	14:42	63.6	59.9	
19-Oct-20	8:04	65.7	60.2	63.0
19-Oct-20	8:09	65.5	58.4	
19-Oct-20	8:14	64.1	59.1	
19-Oct-20	8:19	64.9	59.8	
19-Oct-20	8:24	64.6	58.6	
19-Oct-20	8:29	65.2	58.4	
24-Oct-20	14:12	63.9	58.2	62.4
24-Oct-20	14:17	64.6	59.7	
24-Oct-20	14:22	65.3	57.5	
24-Oct-20	14:27	64.9	57.8	
24-Oct-20	14:32	64.4	58.6	
24-Oct-20	14:37	64.1	60.3	
30-Oct-20	8:18	65.8	59.9	63.2
30-Oct-20	8:23	65.3	59.6	
30-Oct-20	8:28	66.4	58.1	
30-Oct-20	8:33	65.6	58.7	
30-Oct-20	8:38	64.5	60.1	
30-Oct-20	8:43	64.2	59.4	

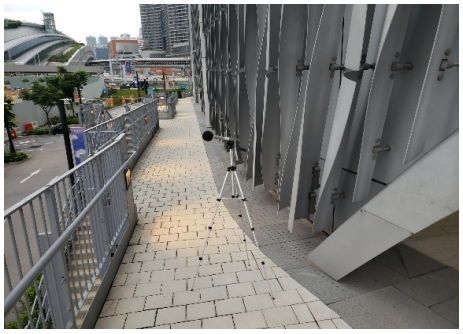


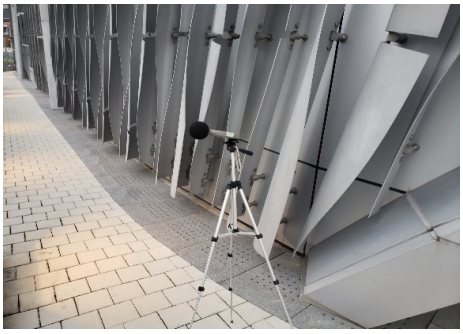
The station set-up of a façade measurement at station NM2A.


NM2A Leq (30 min) dB(A)
NM2A Leq (30 min.) dB(A)
Limit Level dB(A)
77.0
75.0
73.0
71.0
69.0
67.0
65.0
63.0
61.0
59.0
57.0
55.0
Leq (30 min)/ dB(A)
03-Oct-20
04-Oct-20
05-Oct-20
06-Oct-20
07-Oct-20
08-Oct-20
09-Oct-20
10-Oct-20
11-Oct-20
12-Oct-20
13-Oct-20
14-Oct-20
15-Oct-20
16-Oct-20
17-Oct-20
18-Oct-20
19-Oct-20
20-Oct-20
21-Oct-20
22-Oct-20
23-Oct-20
24-Oct-20
25-Oct-20
26-Oct-20
27-Oct-20
28-Oct-20
29-Oct-20
30-Oct-20
Date

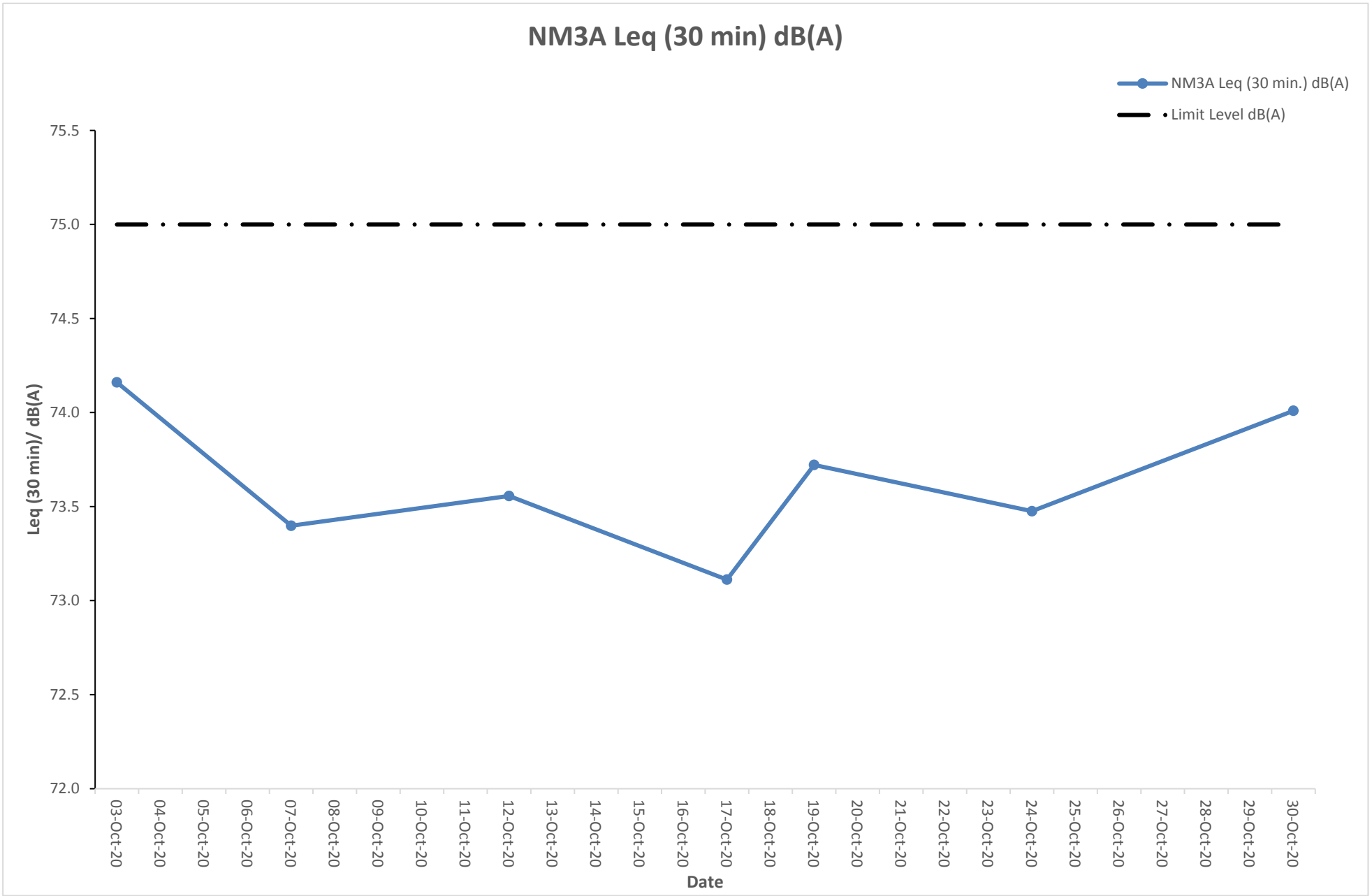
Noise Monitoring Result at Station NM3A

Date	Time	Measured L10 dB(A)	Measured L90 dB(A)	Leq (30 min.) dB(A)
03-Oct-20	9:45	75.6	68.4	74.2
03-Oct-20	9:50	76.2	69.5	
03-Oct-20	9:55	75.4	68.9	
03-Oct-20	10:00	76.4	69.6	
03-Oct-20	10:05	76.3	69.2	
03-Oct-20	10:10	76.6	69.5	
07-Oct-20	15:51	74.5	67.4	73.4
07-Oct-20	15:56	75.2	68.2	
07-Oct-20	16:01	76.5	69.2	
07-Oct-20	16:06	74.5	67.5	
07-Oct-20	16:11	75.6	68.4	
07-Oct-20	16:16	76.3	69.2	
12-Oct-20	9:52	76.7	68.6	73.6
12-Oct-20	9:57	74.6	67.3	
12-Oct-20	10:02	74.9	67.1	
12-Oct-20	10:07	76.3	67.7	
12-Oct-20	10:12	75.1	69.2	
12-Oct-20	10:17	75.6	69.6	
17-Oct-20	15:59	73.9	67.3	73.1
17-Oct-20	16:04	74.7	68.1	
17-Oct-20	16:09	74.3	67.7	
17-Oct-20	16:14	76.1	69.2	
17-Oct-20	16:19	76.4	69.6	
17-Oct-20	16:24	75.6	69.9	
19-Oct-20	9:43	75.3	68.6	73.7
19-Oct-20	9:48	74.9	68.1	
19-Oct-20	9:53	74.4	66.9	
19-Oct-20	9:58	74.7	67.4	
19-Oct-20	10:03	75.9	67.8	
19-Oct-20	10:08	76.3	68.4	
24-Oct-20	15:54	74.8	69.3	73.5
24-Oct-20	15:59	76.6	68.1	
24-Oct-20	16:04	76.2	68.5	
24-Oct-20	16:09	74.7	68.8	
24-Oct-20	16:14	75.4	69.7	
24-Oct-20	16:19	75.9	69.1	
30-Oct-20	10:00	76.6	68.9	74.0
30-Oct-20	10:05	76.2	68.6	
30-Oct-20	10:10	75.1	67.8	
30-Oct-20	10:15	75.7	69.5	
30-Oct-20	10:20	74.9	68.3	
30-Oct-20	10:25	76.4	67.4	



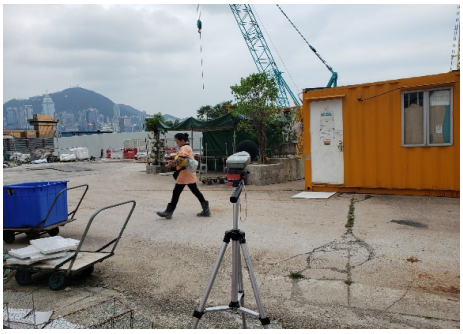


The station set-up of a façade measurement at station NM3A.

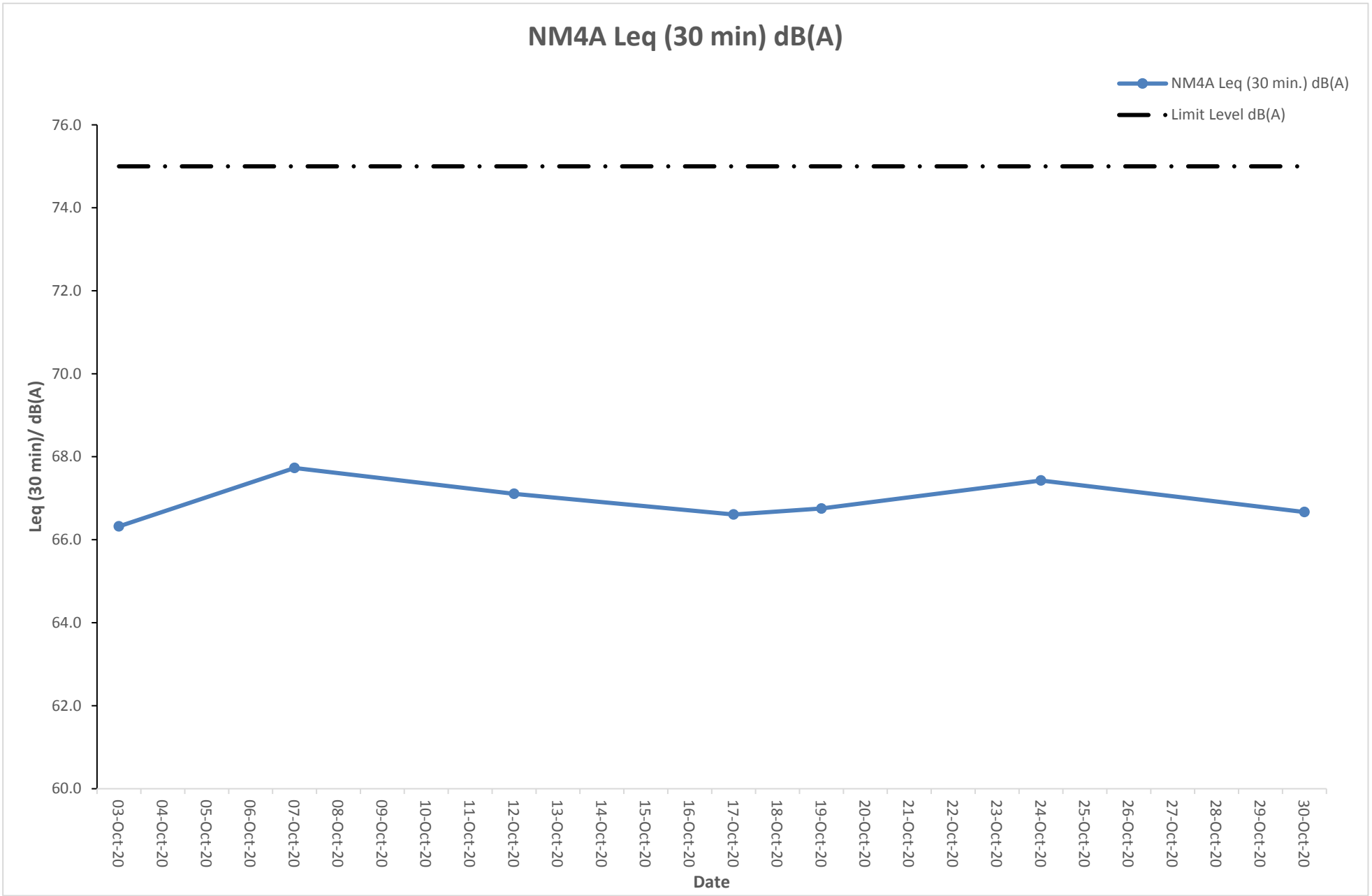

NM3A Leq (30 min) dB(A)
NM3A Leq (30 min.) dB(A)
Limit Level dB(A)
75.5
75.0
74.5
74.0
73.5
73.0
72.5
72.0
Leq (30 min)/ dB(A)
03-Oct-20
04-Oct-20
05-Oct-20
06-Oct-20
07-Oct-20
08-Oct-20
09-Oct-20
10-Oct-20
11-Oct-20
12-Oct-20
13-Oct-20
14-Oct-20
15-Oct-20
16-Oct-20
17-Oct-20
18-Oct-20
19-Oct-20
20-Oct-20
21-Oct-20
22-Oct-20
23-Oct-20
24-Oct-20
25-Oct-20
26-Oct-20
27-Oct-20
28-Oct-20
29-Oct-20
30-Oct-20
Date

Noise Monitoring Result at Station NM4A

Date	Time	Measured L10 dB(A)	Measured L90 dB(A)	Leq (30 min.) dB(A)
03-Oct-20	10:20	68.4	66.3	66.3
03-Oct-20	10:25	67.4	64.5	
03-Oct-20	10:30	66.2	59.5	
03-Oct-20	10:35	67.3	64.5	
03-Oct-20	10:40	66.1	59.4	
03-Oct-20	10:45	67.1	64.2	
07-Oct-20	16:26	68.4	66.5	67.7
07-Oct-20	16:31	68.2	66.3	
07-Oct-20	16:36	69.4	67.5	
07-Oct-20	16:41	68.4	66.5	
07-Oct-20	16:46	68.3	66.3	
07-Oct-20	16:51	68.7	66.5	
12-Oct-20	10:27	69.1	64.6	67.1
12-Oct-20	10:32	67.7	62.3	
12-Oct-20	10:37	67.9	60.5	
12-Oct-20	10:42	68.6	63.8	
12-Oct-20	10:47	69.4	62.9	
12-Oct-20	10:52	68.3	61.4	
17-Oct-20	16:34	67.8	62.5	66.6
17-Oct-20	16:39	69.3	60.7	
17-Oct-20	16:44	69.6	61.1	
17-Oct-20	16:49	68.9	63.4	
17-Oct-20	16:54	68.2	62.8	
17-Oct-20	16:59	68.5	62.2	
19-Oct-20	10:18	68.4	61.9	66.8
19-Oct-20	10:23	68.9	61.4	
19-Oct-20	10:28	69.1	62.2	
19-Oct-20	10:33	69.7	62.7	
19-Oct-20	10:38	68.6	61.6	
19-Oct-20	10:43	68.8	61.1	
24-Oct-20	16:29	69.6	64.1	67.4
24-Oct-20	16:34	69.8	63.3	
24-Oct-20	16:39	68.7	63.8	
24-Oct-20	16:44	69.1	62.6	
24-Oct-20	16:49	69.5	61.7	
24-Oct-20	16:54	68.9	62.2	
30-Oct-20	10:35	68.8	62.7	66.7
30-Oct-20	10:40	68.2	62.3	
30-Oct-20	10:45	67.4	63.4	
30-Oct-20	10:50	69.1	63.9	
30-Oct-20	10:55	69.8	63.1	
30-Oct-20	11:00	69.3	62.5	



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

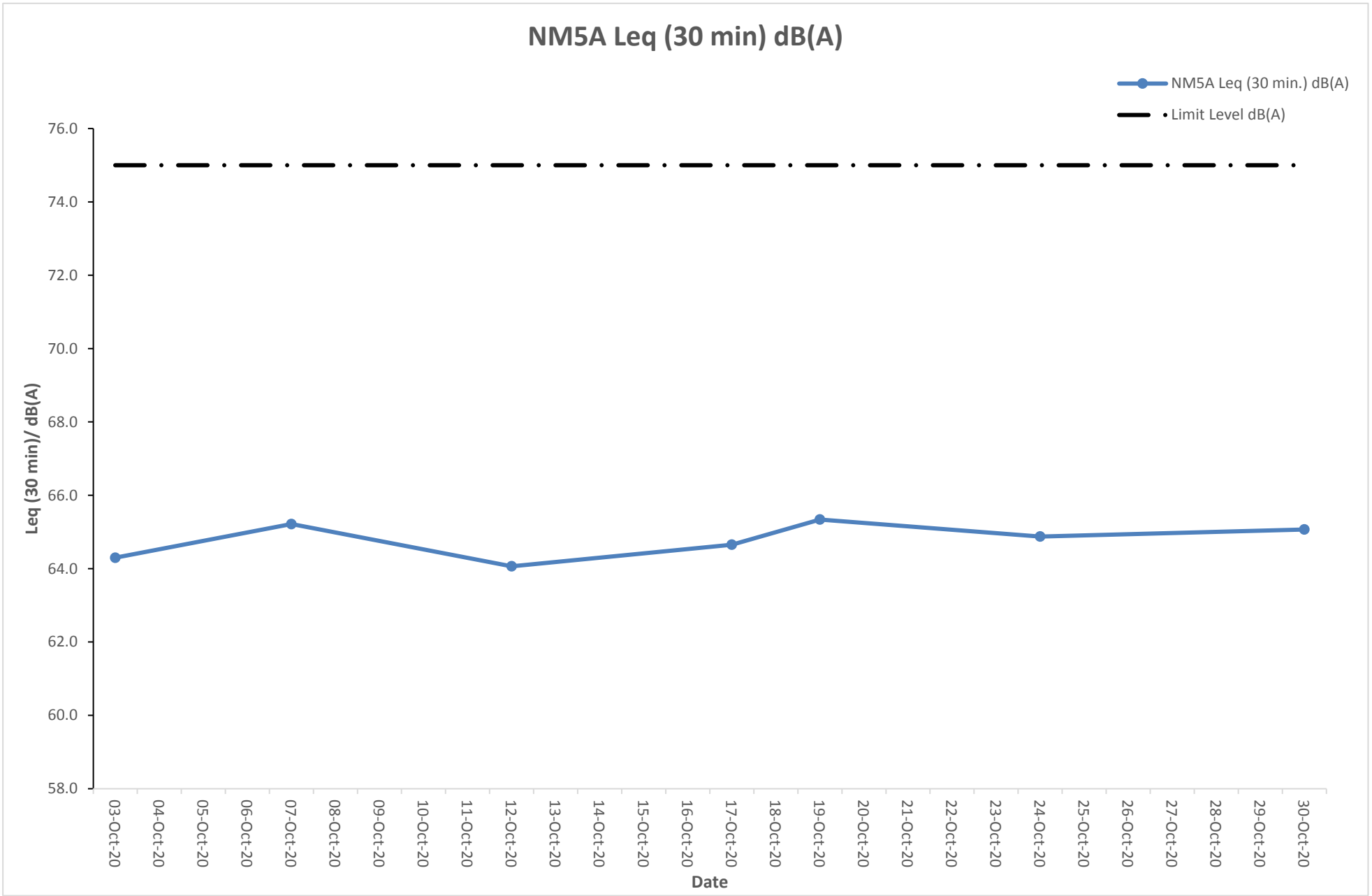

NM4A Leq (30 min) dB(A)
NM4A Leq (30 min.) dB(A)
Limit Level dB(A)
Leq (30 min)/ dB(A)
76.0
74.0
72.0
70.0
68.0
66.0
64.0
62.0
60.0
03-Oct-20
04-Oct-20
05-Oct-20
06-Oct-20
07-Oct-20
08-Oct-20
09-Oct-20
10-Oct-20
11-Oct-20
12-Oct-20
13-Oct-20
14-Oct-20
15-Oct-20
16-Oct-20
17-Oct-20
18-Oct-20
19-Oct-20
20-Oct-20
21-Oct-20
22-Oct-20
23-Oct-20
24-Oct-20
25-Oct-20
26-Oct-20
27-Oct-20
28-Oct-20
29-Oct-20
30-Oct-20
Date

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)
03-Oct-20	9:05	61.4	55.5	61.3	64.3
03-Oct-20	9:10	63.2	60.4		
03-Oct-20	9:15	62.4	58.5		
03-Oct-20	9:20	61.2	55.3		
03-Oct-20	9:25	64.1	60.5		
03-Oct-20	9:30	65.6	61.5		
07-Oct-20	15:10	64.3	60.2	62.2	65.2
07-Oct-20	15:15	63.3	60.2		
07-Oct-20	15:20	63.4	60.5		
07-Oct-20	15:25	62.3	58.4		
07-Oct-20	15:30	65.3	61.1		
07-Oct-20	15:35	65.4	61.2		
12-Oct-20	9:12	63.4	57.8	61.1	64.1
12-Oct-20	9:17	64.5	60.4		
12-Oct-20	9:22	61.9	58.6		
12-Oct-20	9:27	62.6	55.9		
12-Oct-20	9:32	63.8	56.3		
12-Oct-20	9:37	63.1	57.5		
17-Oct-20	15:18	62.7	58.6	61.7	64.7
17-Oct-20	15:23	63.6	58.1		
17-Oct-20	15:28	63.2	59.4		
17-Oct-20	15:33	63.8	59.7		
17-Oct-20	15:38	64.7	58.5		
17-Oct-20	15:43	64.4	57.3		
19-Oct-20	9:03	63.9	57.4	62.3	65.3
19-Oct-20	9:08	63.2	57.7		
19-Oct-20	9:13	64.5	58.6		
19-Oct-20	9:18	65.7	58.1		
19-Oct-20	9:23	65.1	58.8		
19-Oct-20	9:28	64.8	59.4		
24-Oct-20	15:13	64.4	59.1	61.9	64.9
24-Oct-20	15:18	64.9	60.1		
24-Oct-20	15:23	63.7	58.8		
24-Oct-20	15:28	62.8	59.6		
24-Oct-20	15:33	63.3	57.9		
24-Oct-20	15:38	64.1	58.3		
30-Oct-20	9:19	63.6	58.4	62.1	65.1
30-Oct-20	9:24	65.2	58.1		
30-Oct-20	9:29	64.7	57.3		
30-Oct-20	9:34	64.4	57.8		
30-Oct-20	9:39	64.9	58.9		
30-Oct-20	9:44	63.3	58.5		

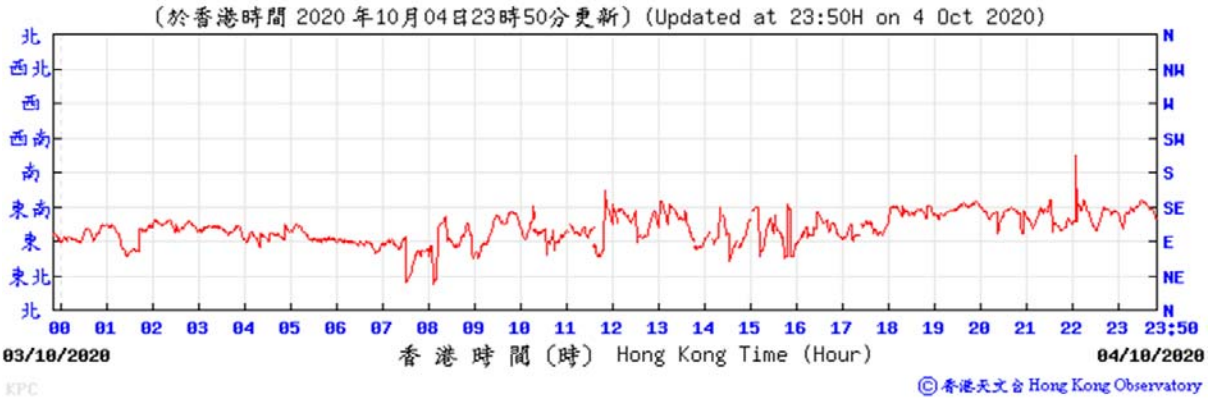
Remarks:
+3dB(A) correction was applied to free-field measurement.

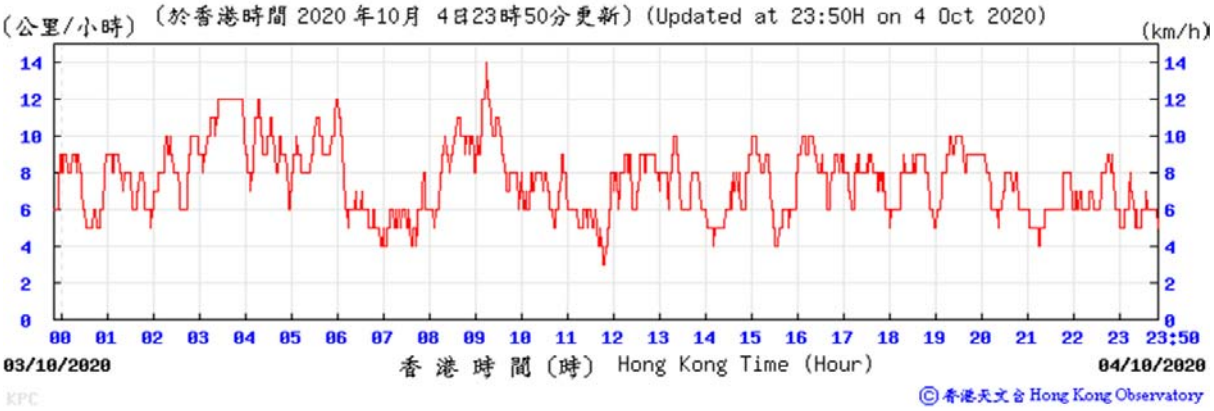
The station set-up of a free-field measurement at station NM5A.

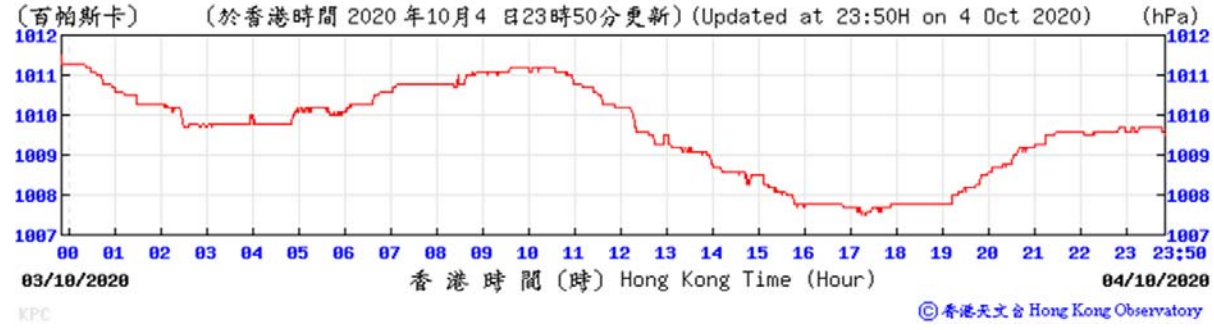

NM5A Leq (30 min) dB(A)
NM5A Leq (30 min.) dB(A)
Limit Level dB(A)
Leq (30 min)/ dB(A)
76.0
74.0
72.0
70.0
68.0
66.0
64.0
62.0
60.0
58.0
03-Oct-20
04-Oct-20
05-Oct-20
06-Oct-20
07-Oct-20
08-Oct-20
09-Oct-20
10-Oct-20
11-Oct-20
12-Oct-20
13-Oct-20
14-Oct-20
15-Oct-20
16-Oct-20
17-Oct-20
18-Oct-20
19-Oct-20
20-Oct-20
21-Oct-20
22-Oct-20
23-Oct-20
24-Oct-20
25-Oct-20
26-Oct-20
27-Oct-20
28-Oct-20
29-Oct-20
30-Oct-20
Date

H. Meteorological Data Extracted from Hong Kong Observatory

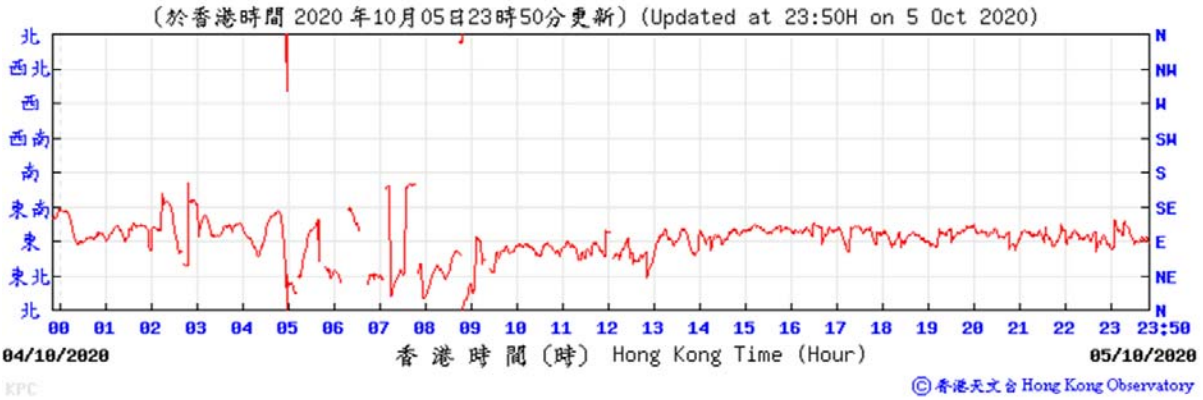
Extract of Meteorological Observations for King's Park Automatic Weather Station, October 2020

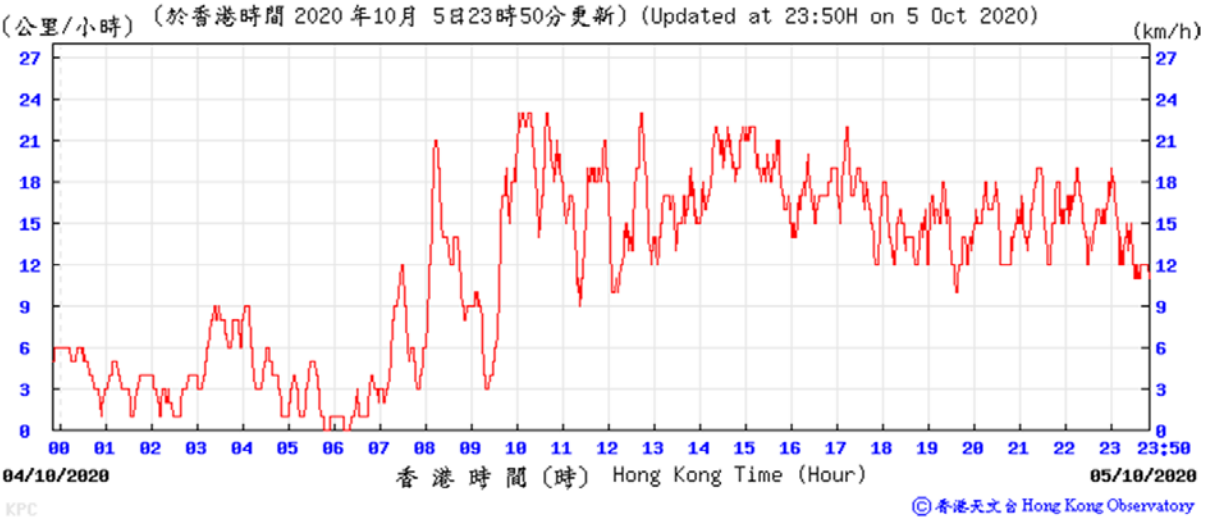


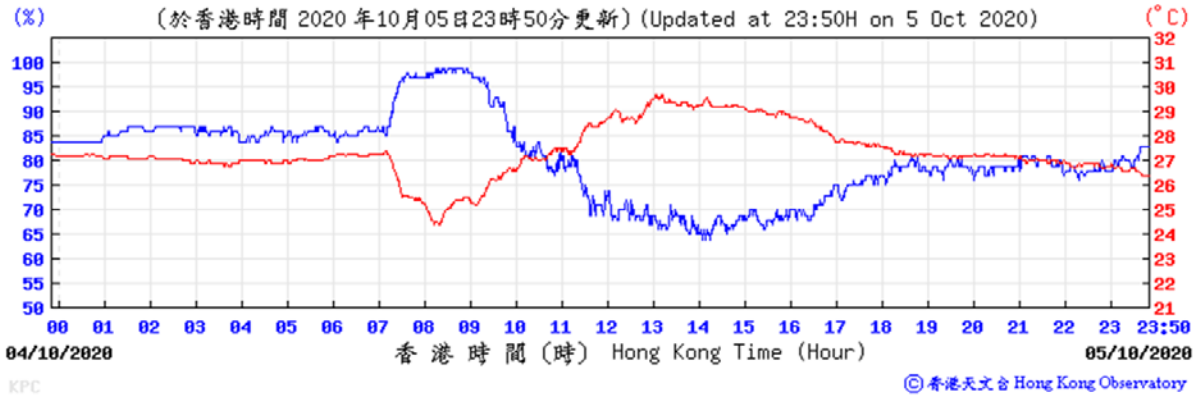


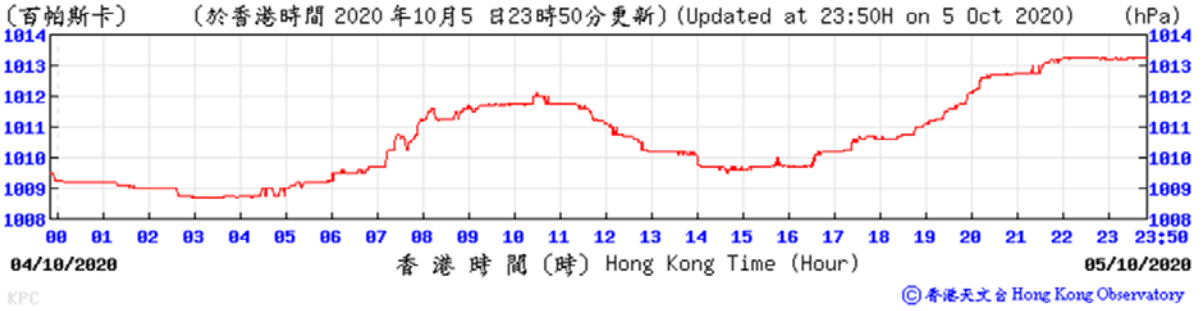


Extract of Meteorological Observations for King's Park Automatic Weather Station, October 2020

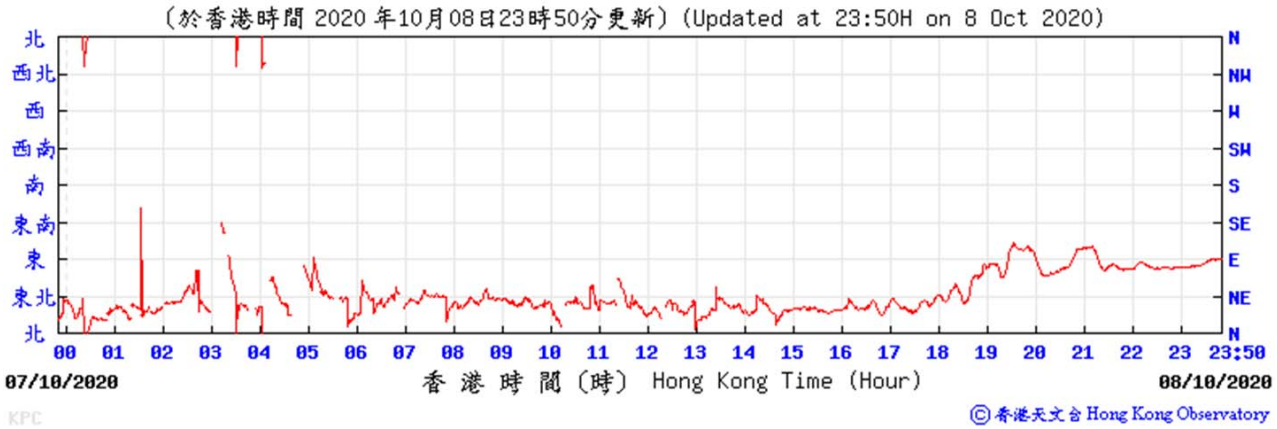


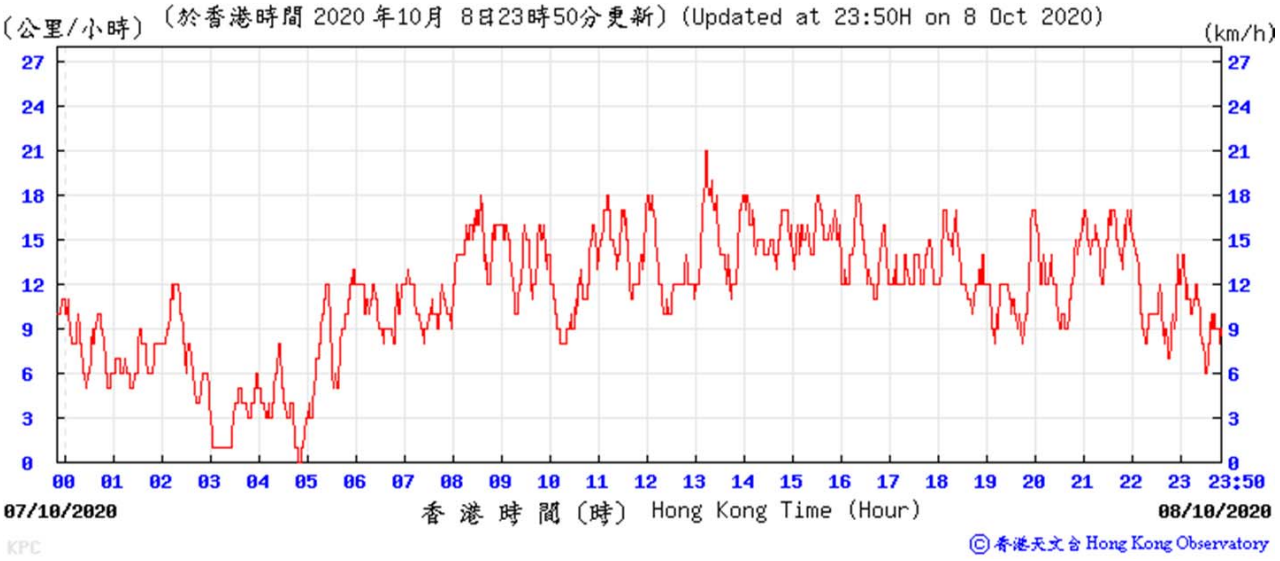


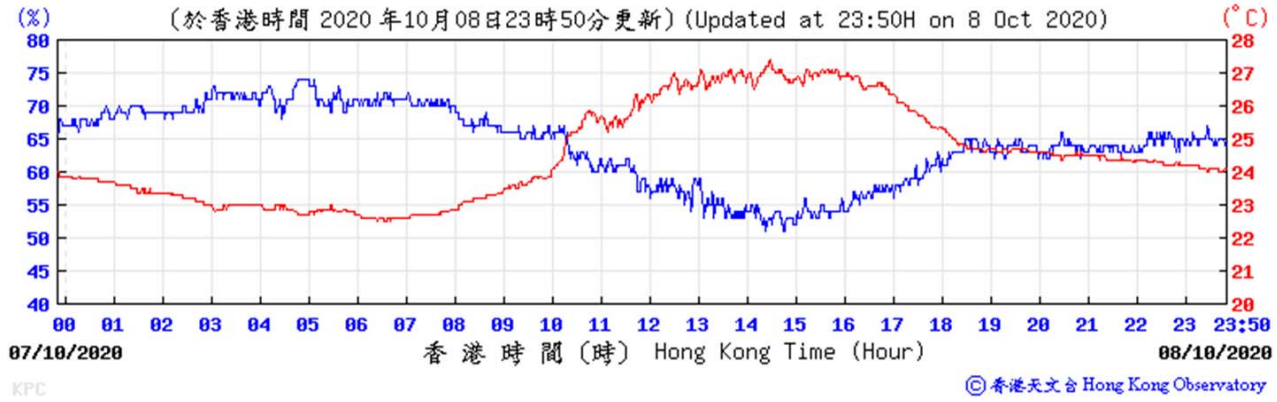


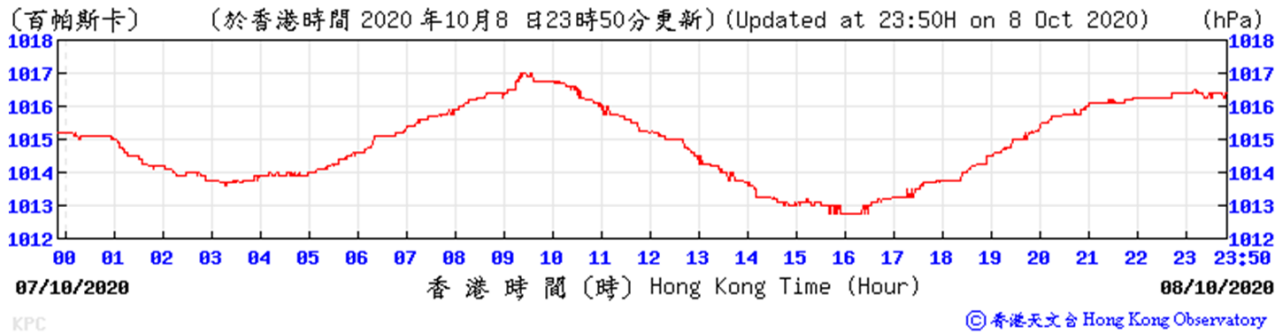


Extract of Meteorological Observations for King's Park Automatic Weather Station, October 2020

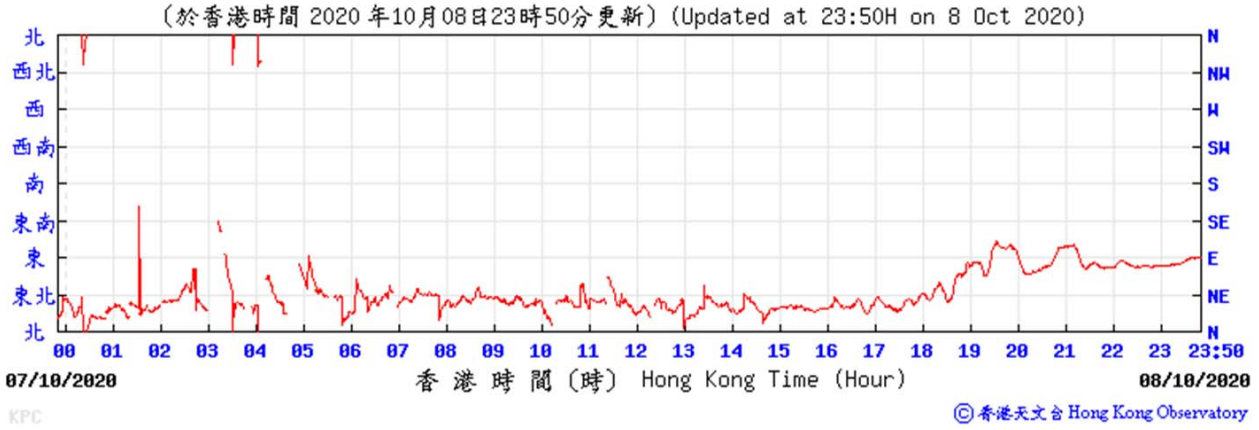


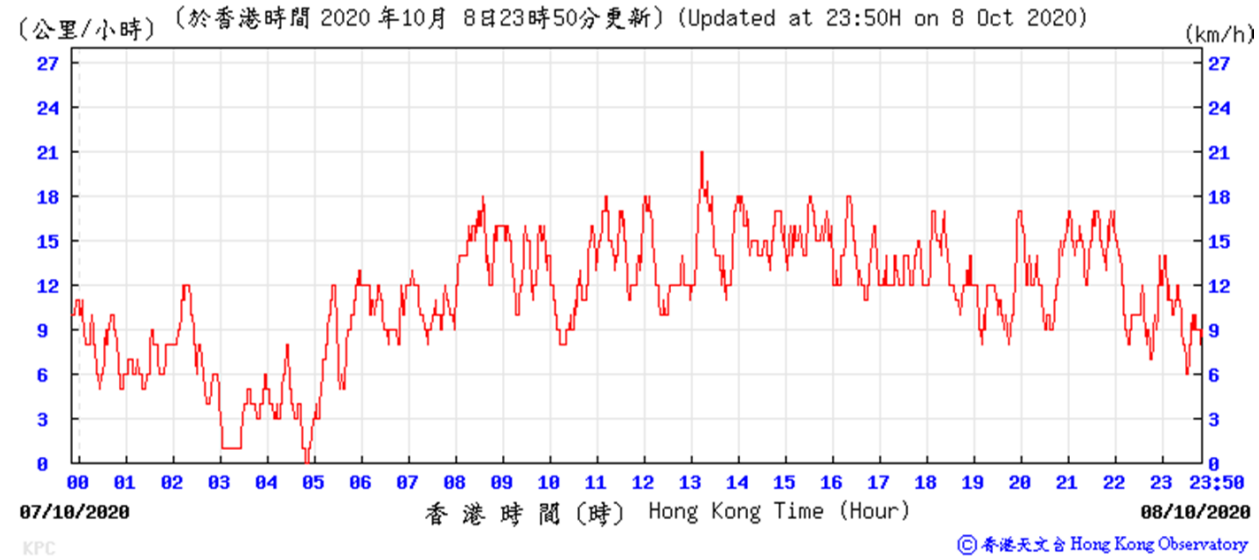


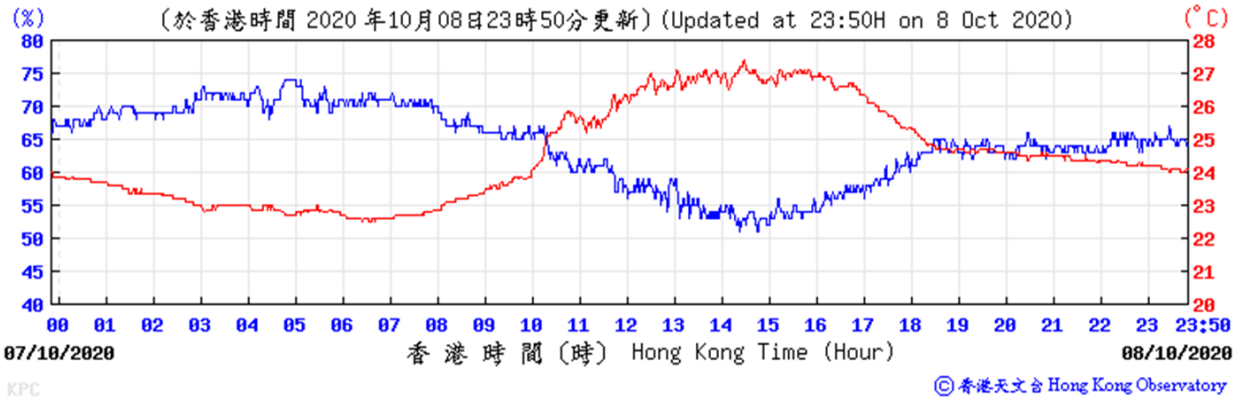


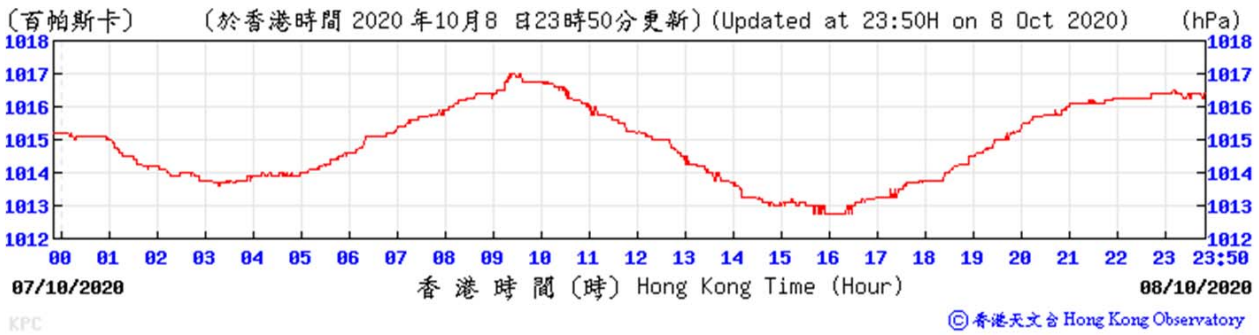


Extract of Meteorological Observations for King's Park Automatic Weather Station, October 2020

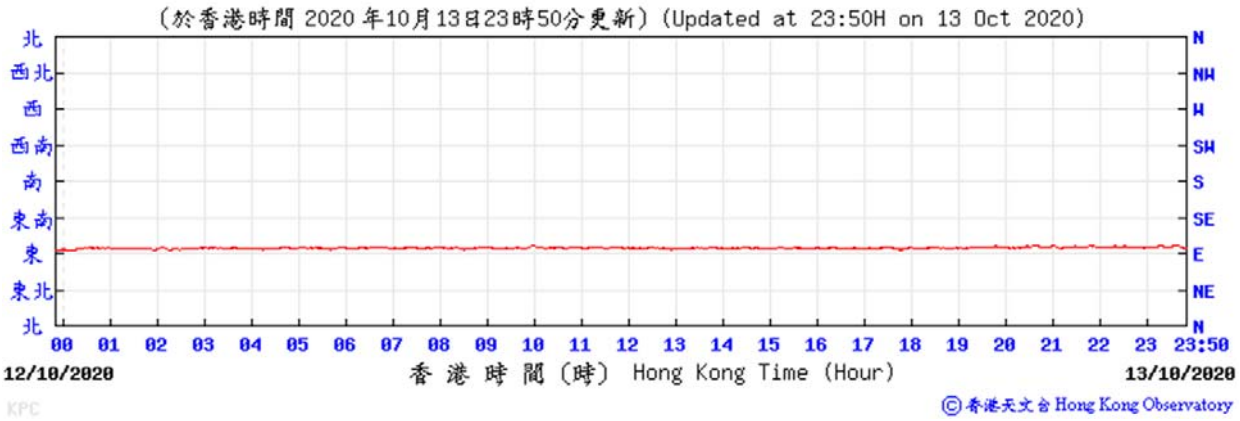


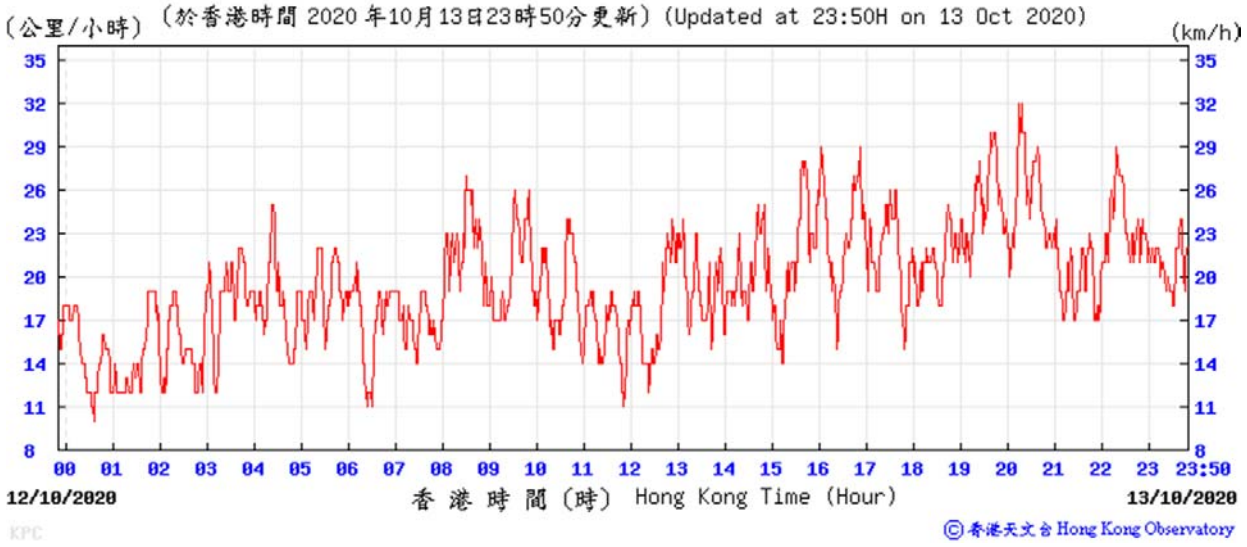


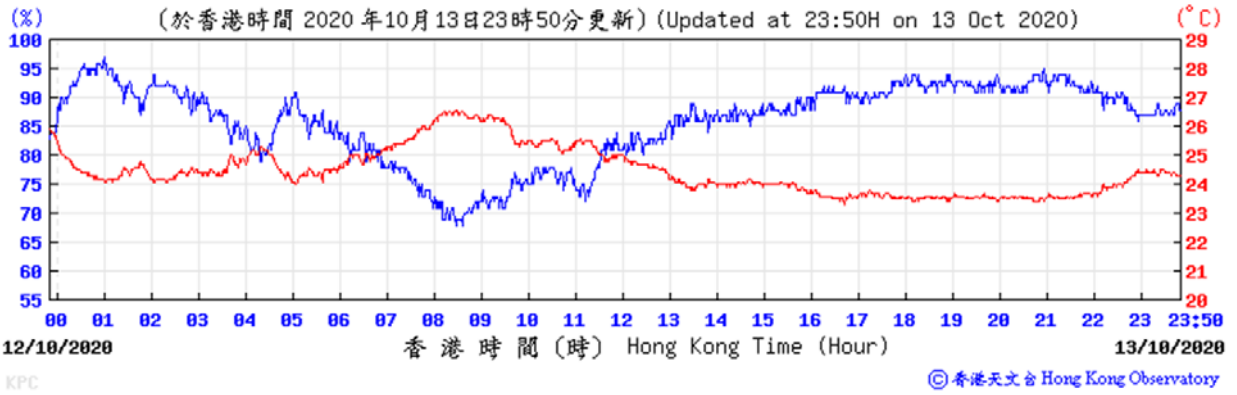


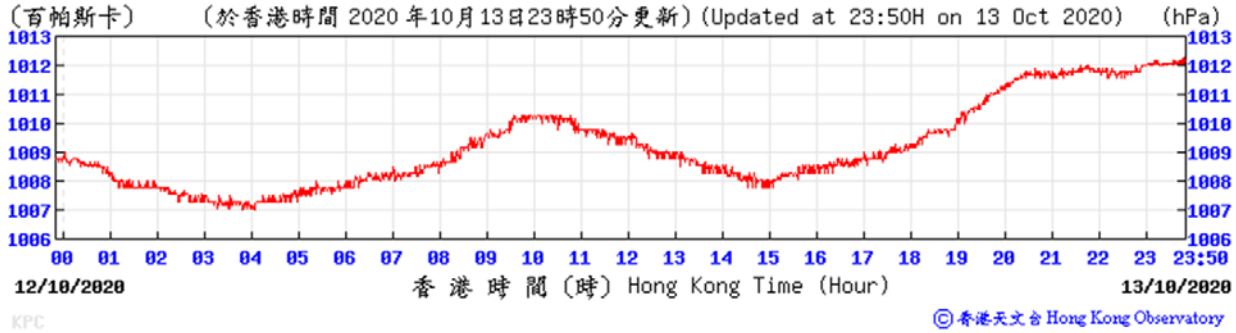


Extract of Meteorological Observations for King's Park Automatic Weather Station, October 2020

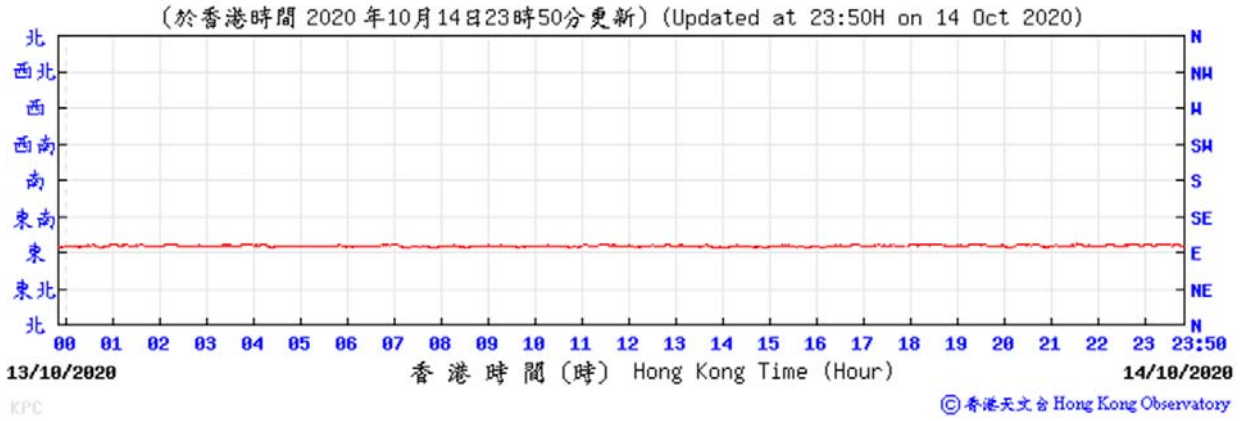


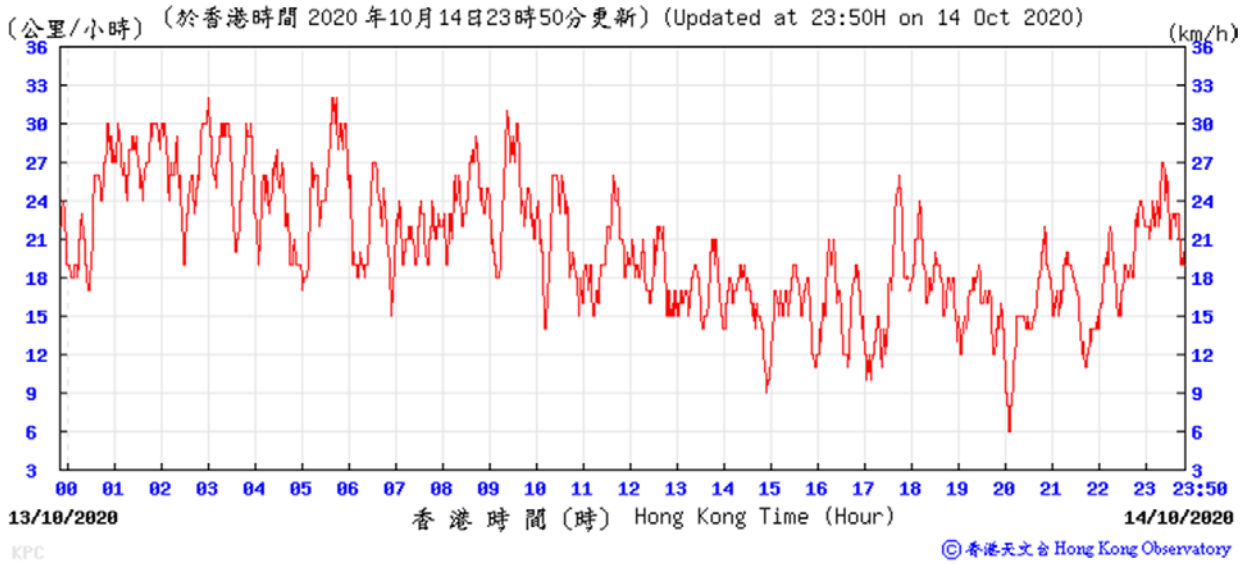


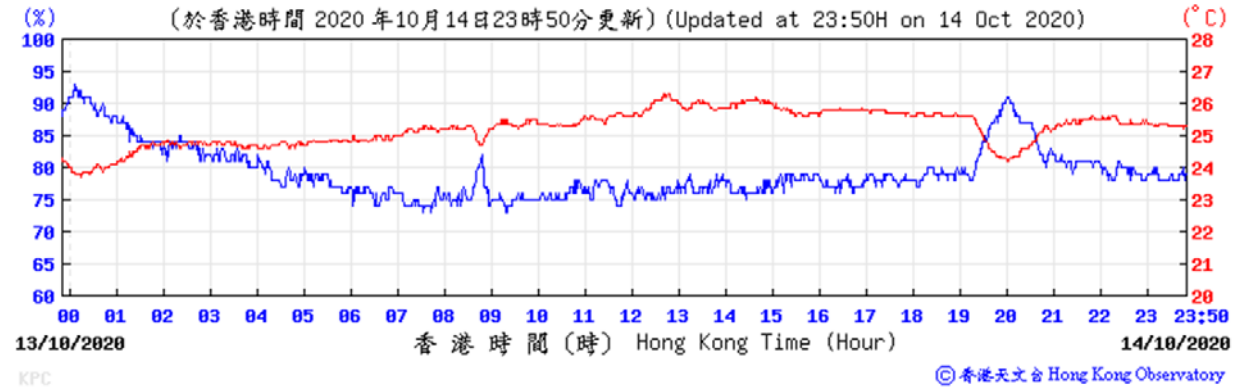


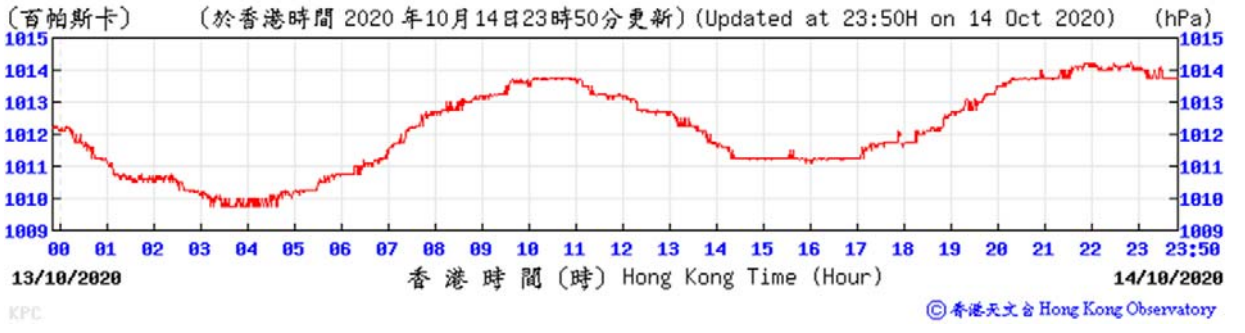


Extract of Meteorological Observations for King's Park Automatic Weather Station, October 2020

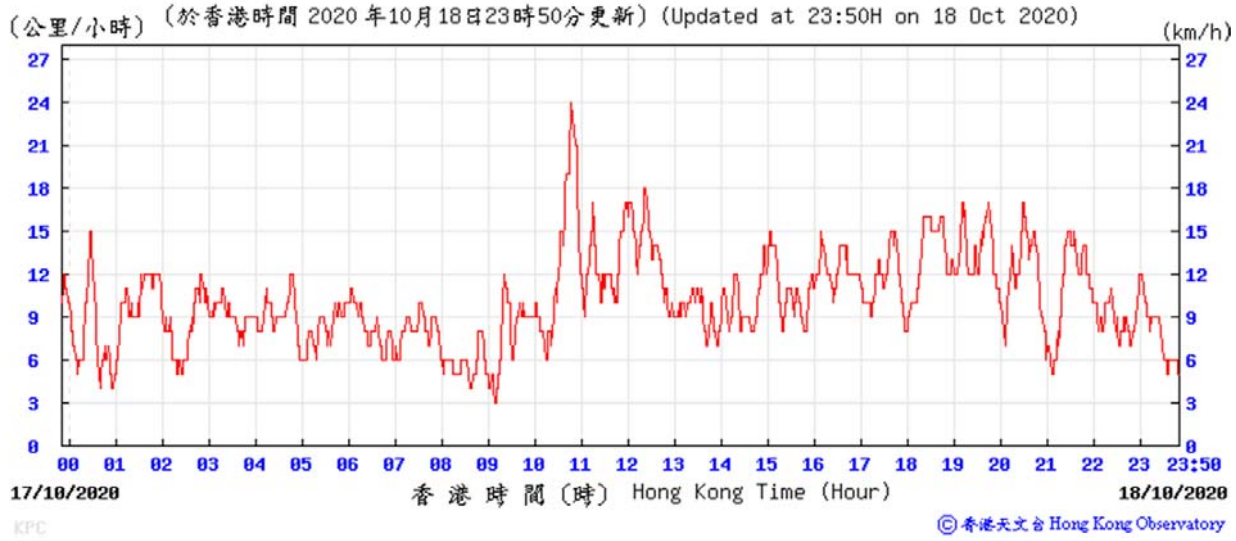


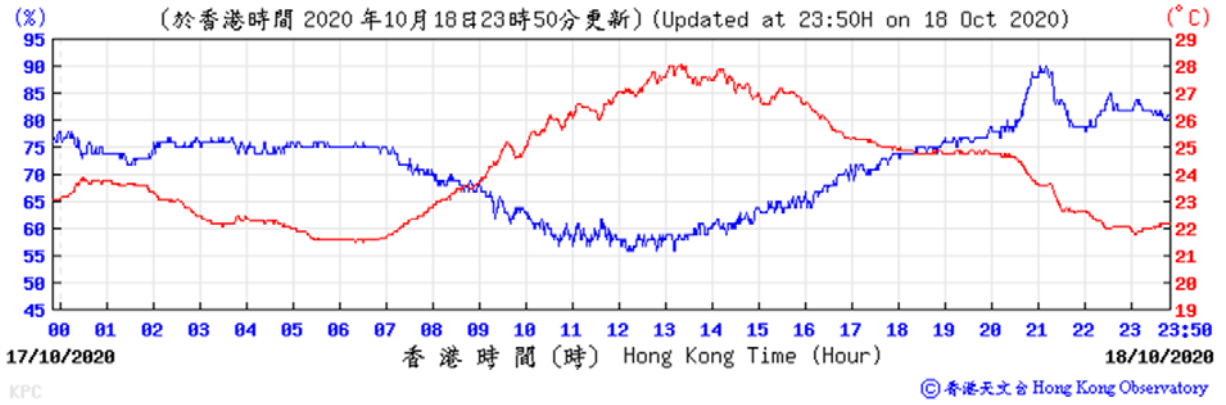


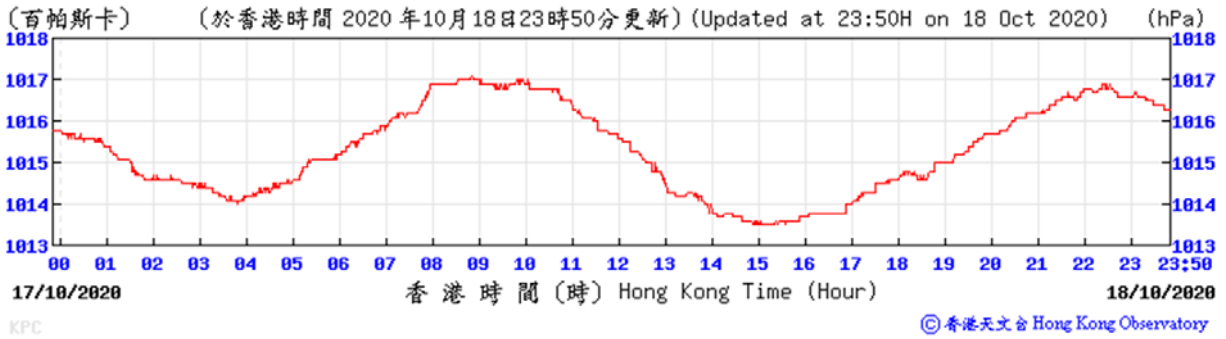




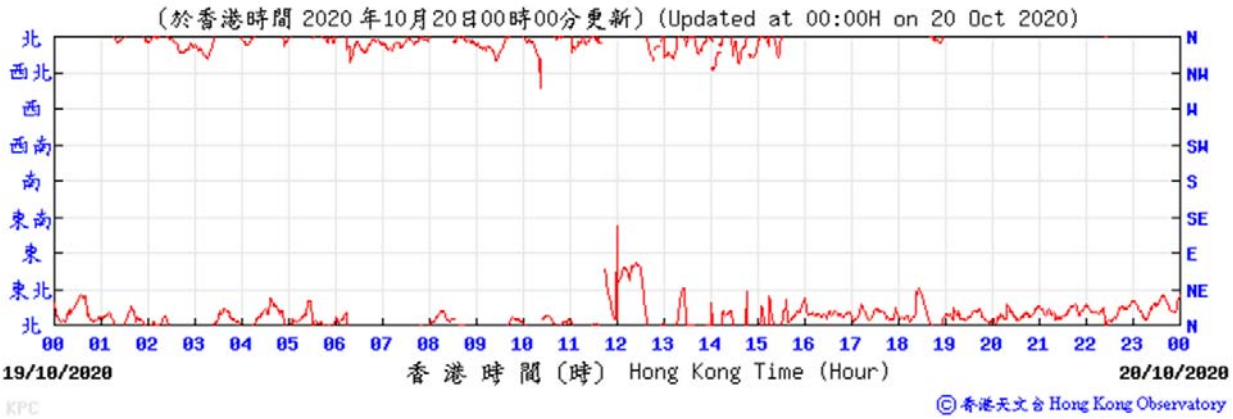
Extract of Meteorological Observations for King's Park Automatic Weather Station, October 2020

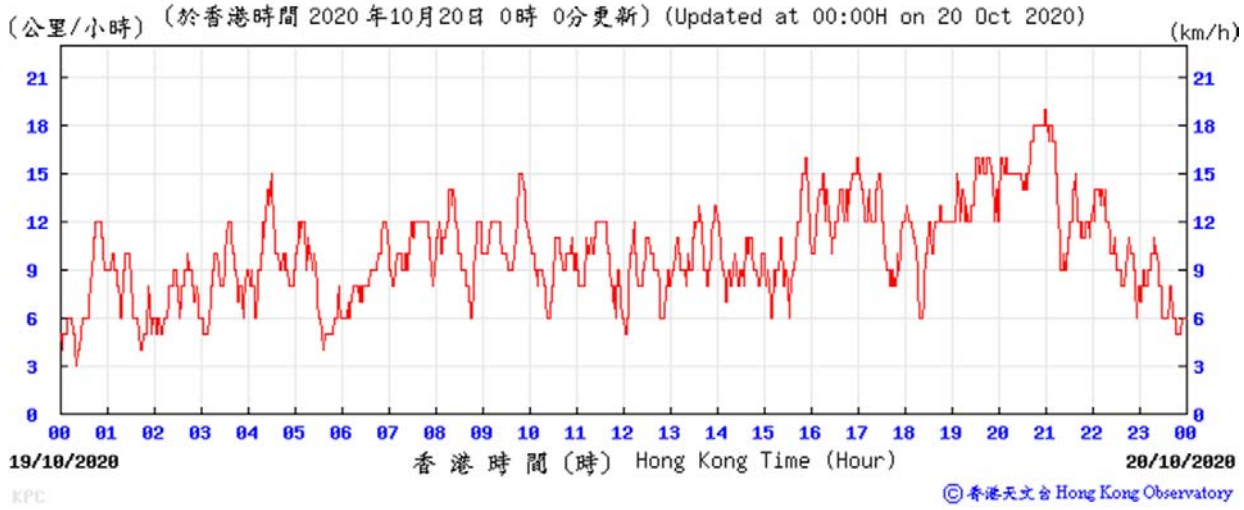


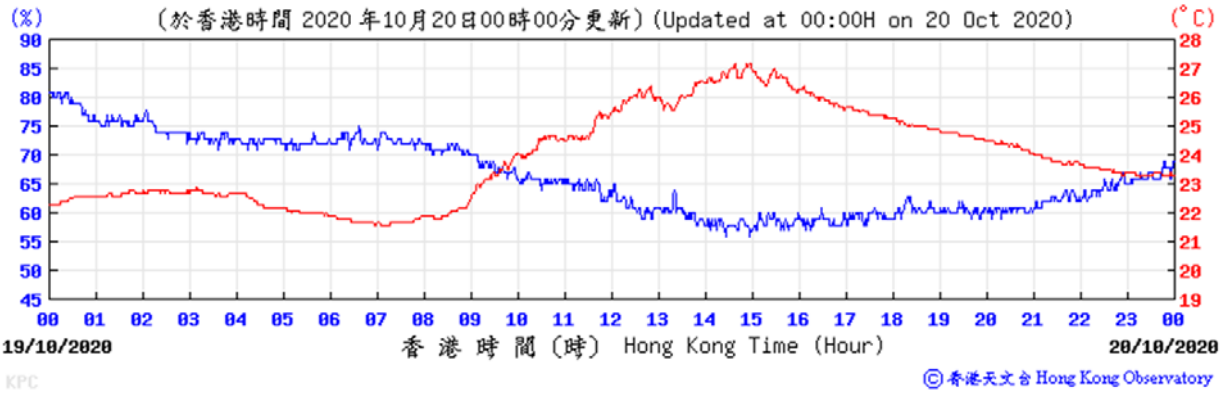


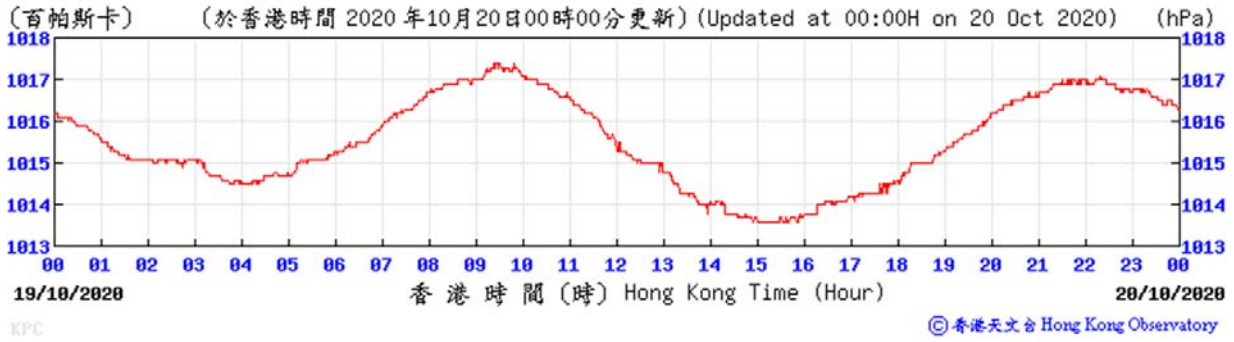


Extract of Meteorological Observations for King's Park Automatic Weather Station, October 2020

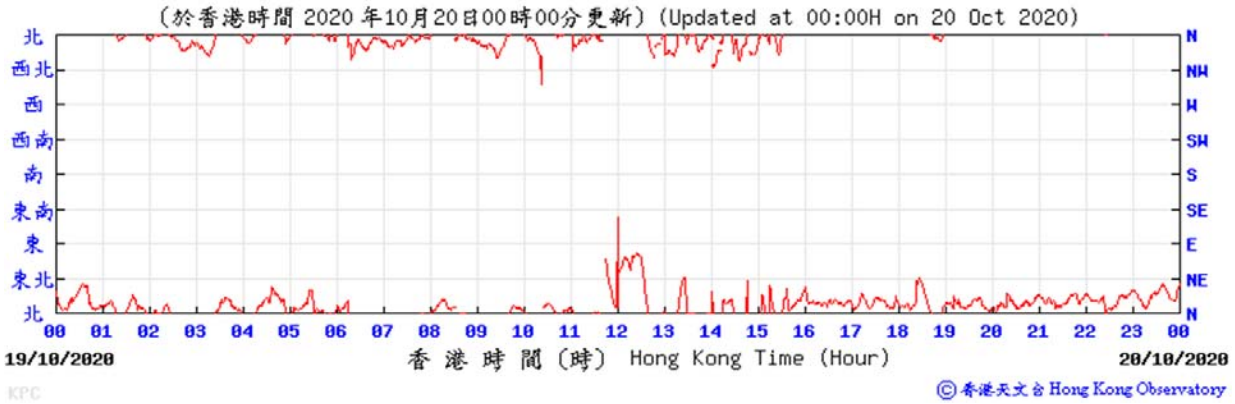


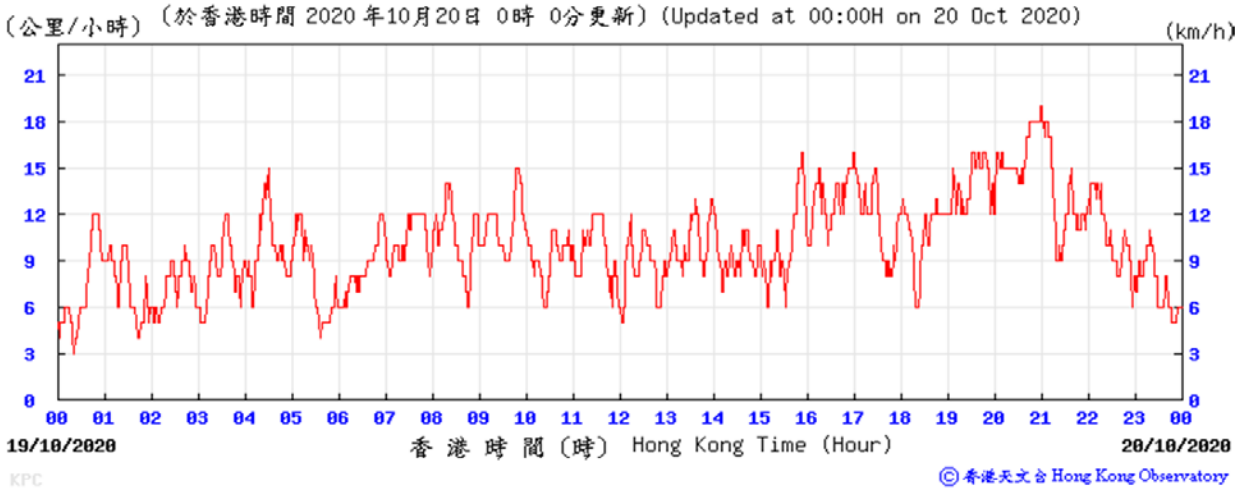


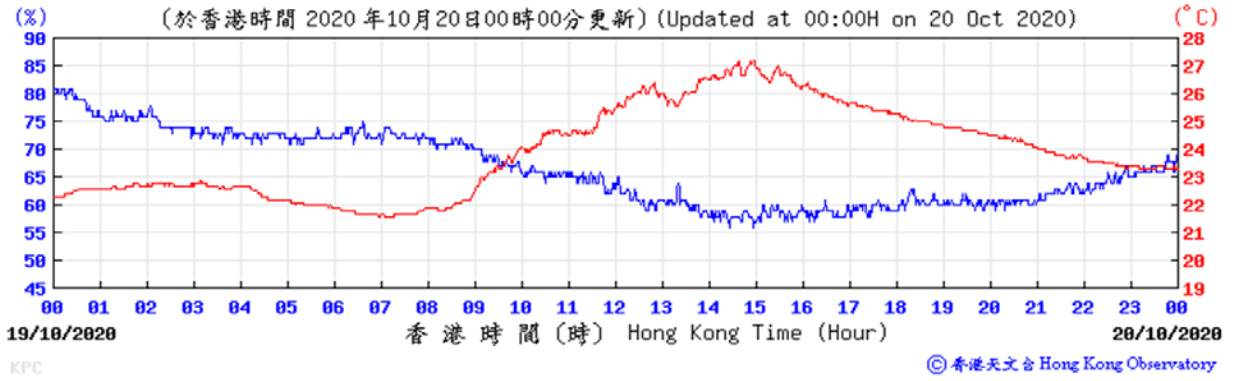


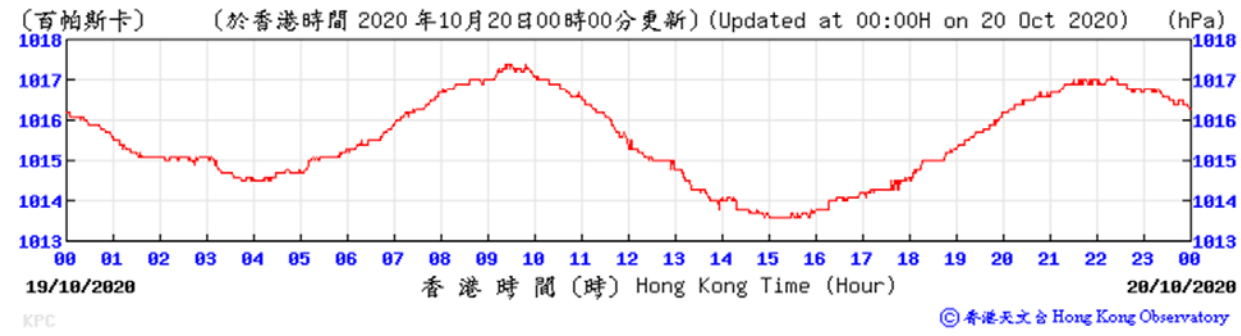


Extract of Meteorological Observations for King's Park Automatic Weather Station, October 2020

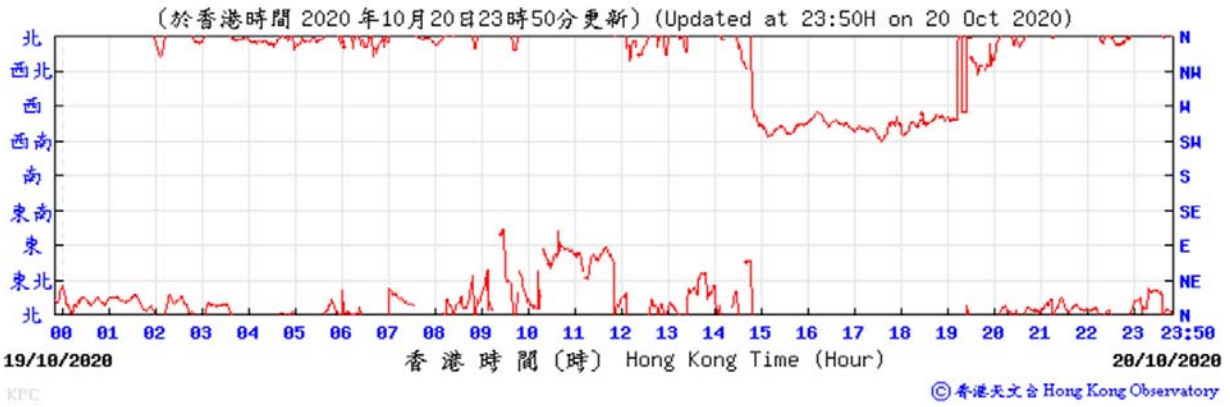


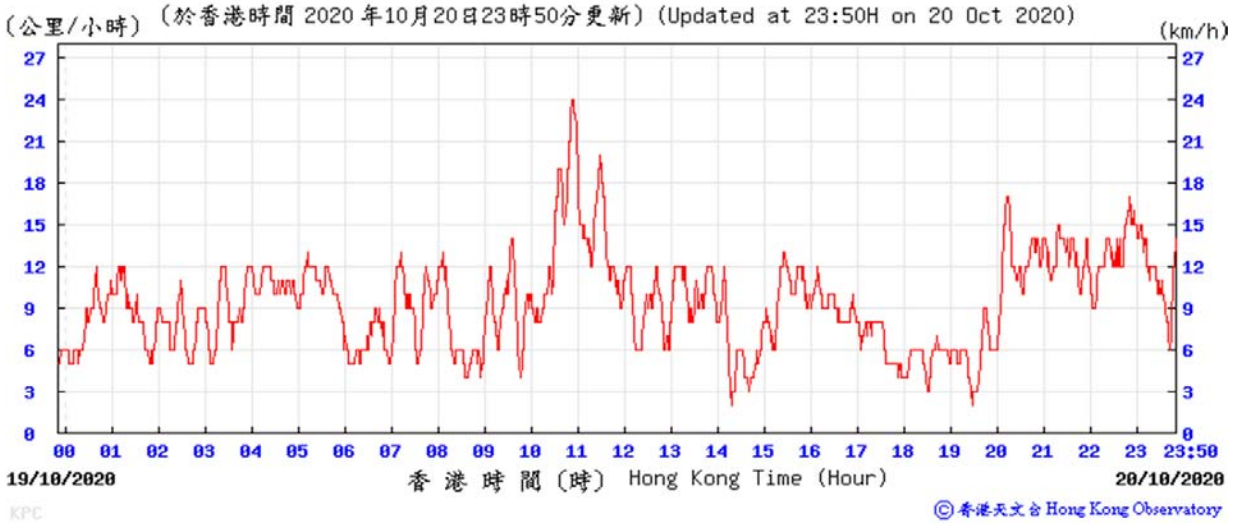


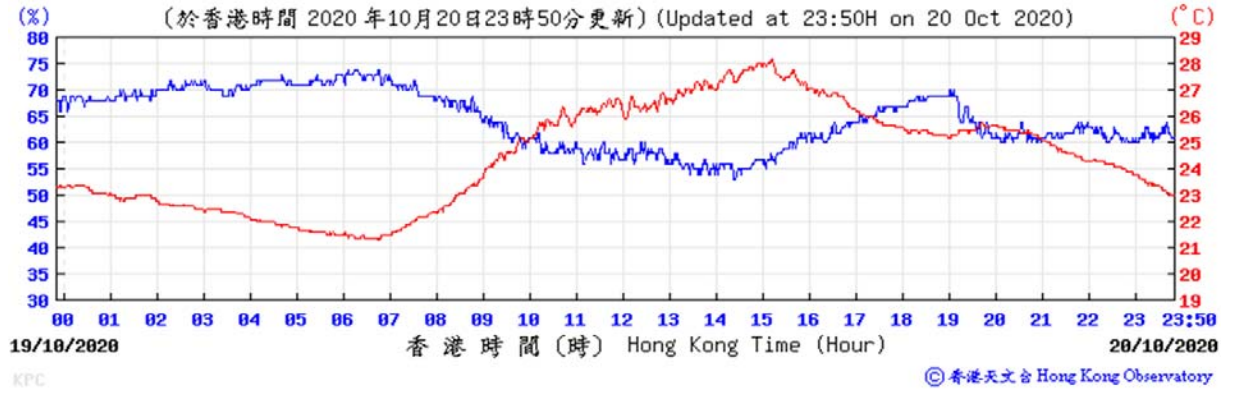


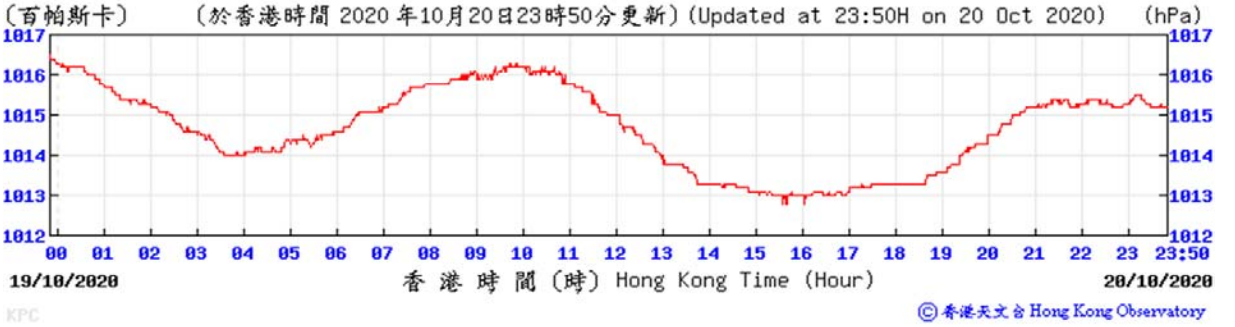


Extract of Meteorological Observations for King's Park Automatic Weather Station, October 2020

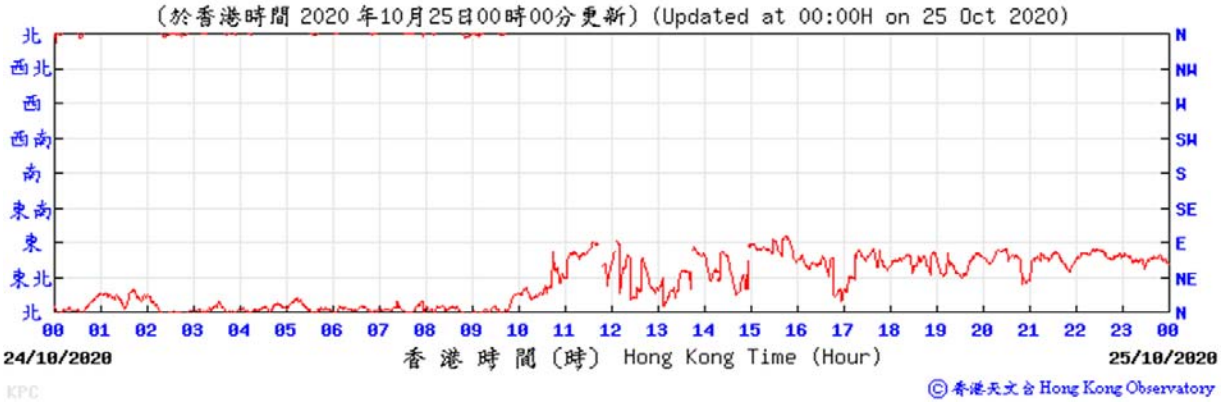


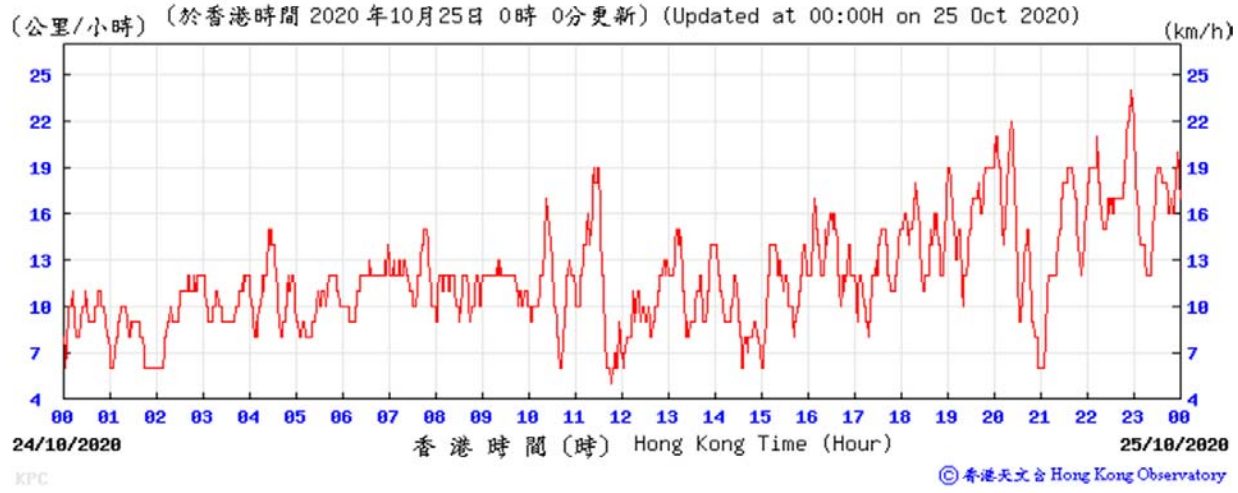


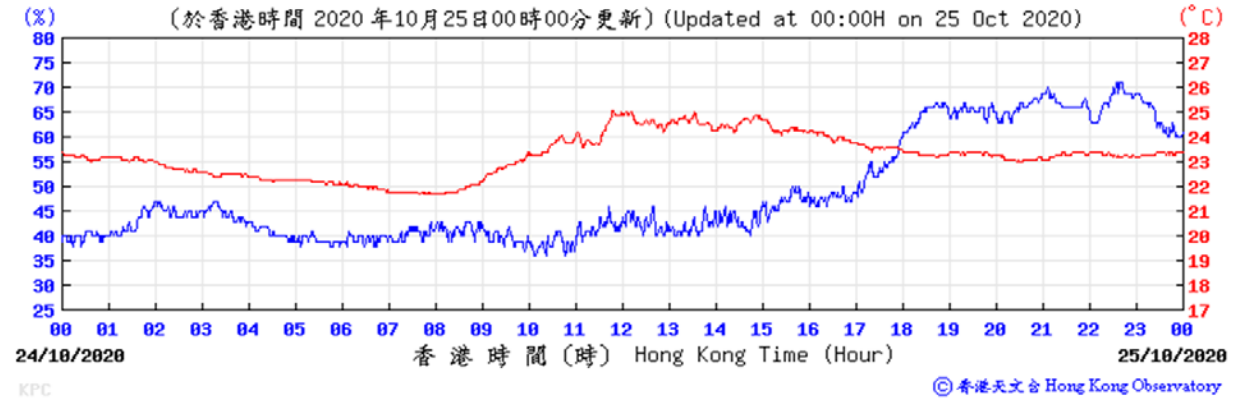


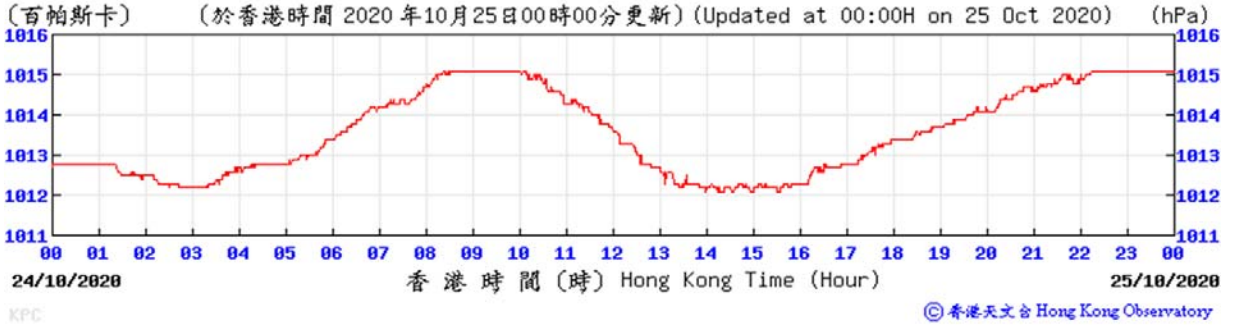


Extract of Meteorological Observations for King's Park Automatic Weather Station, October 2020









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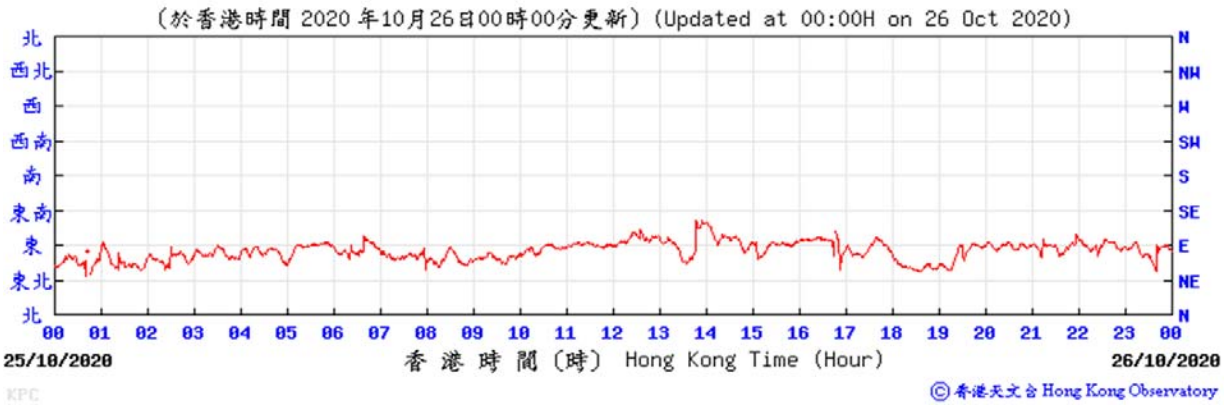

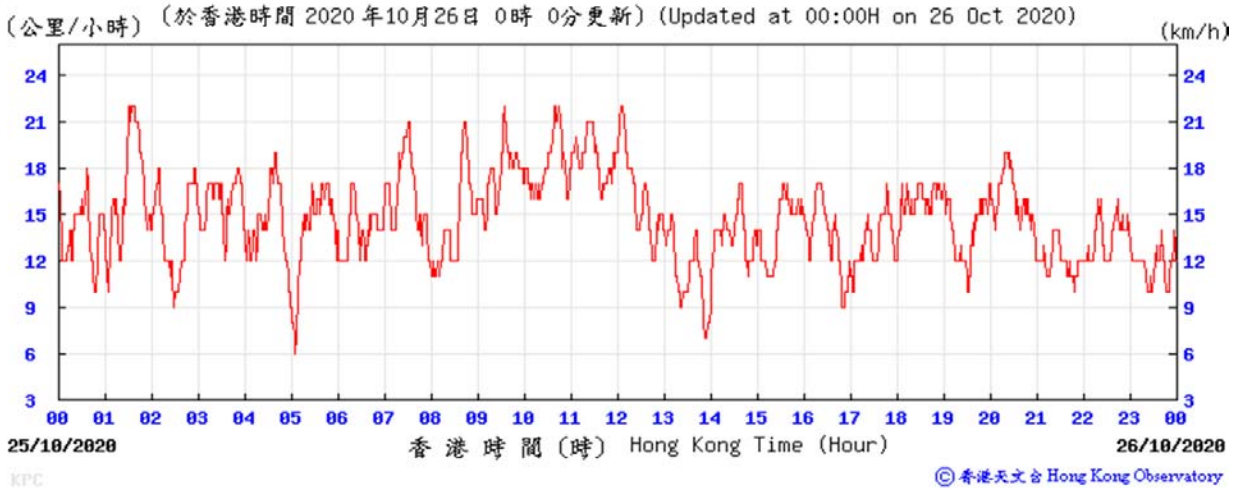

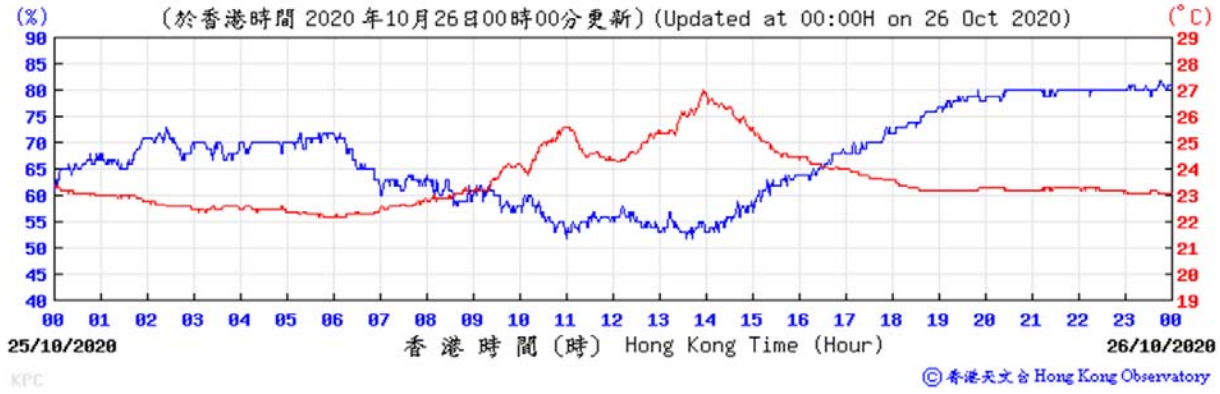

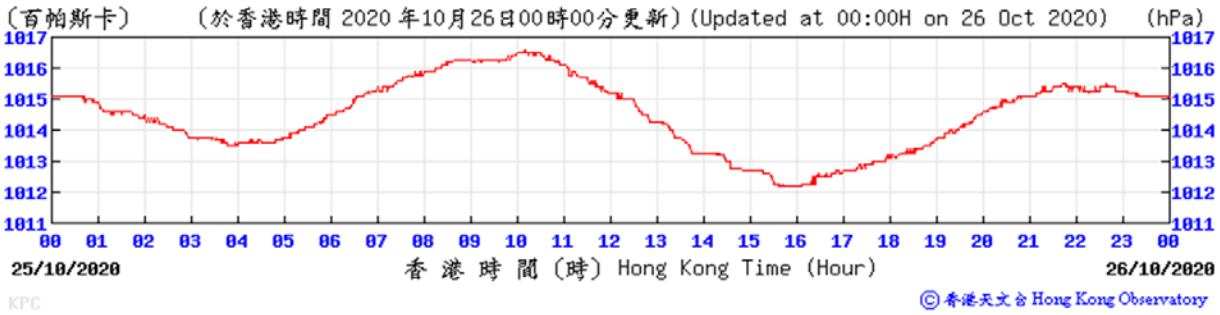

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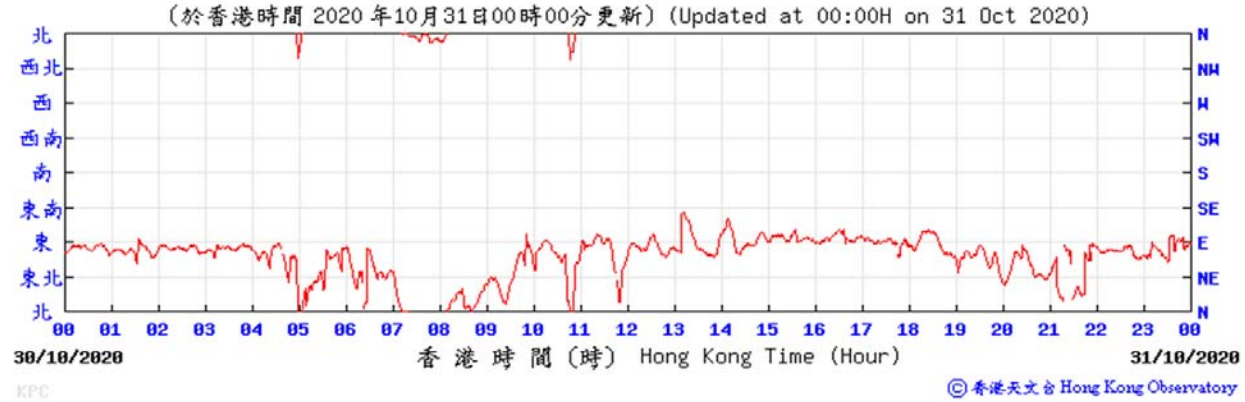

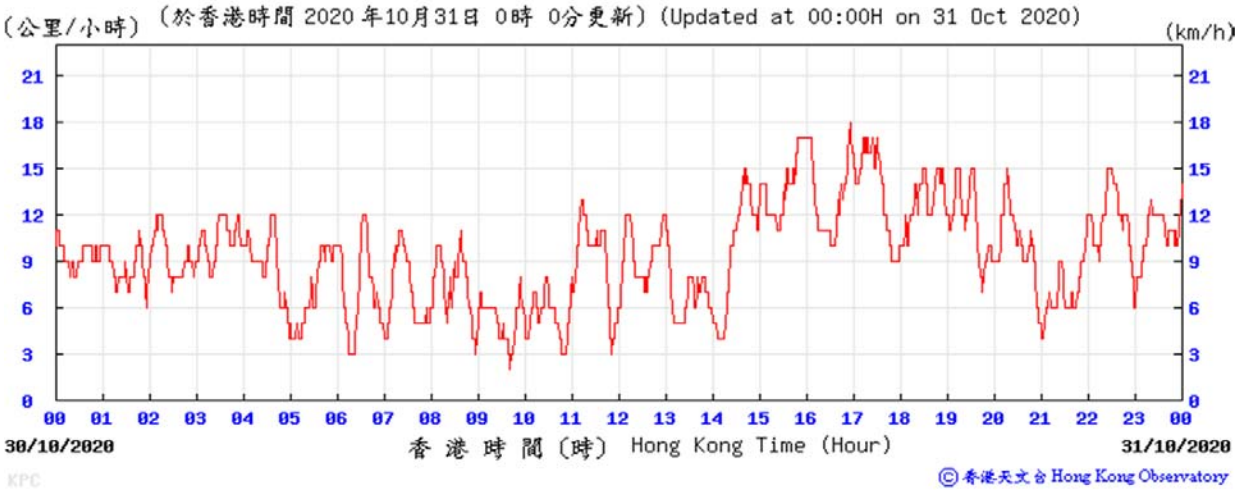

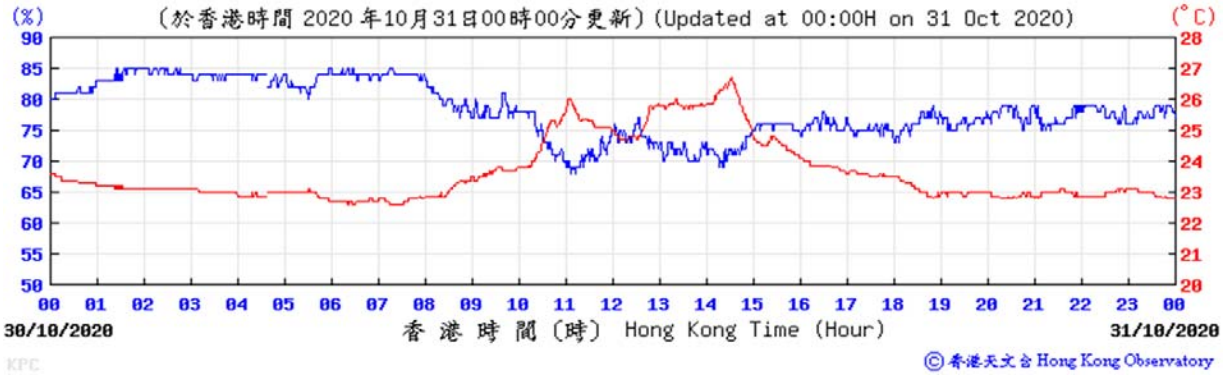

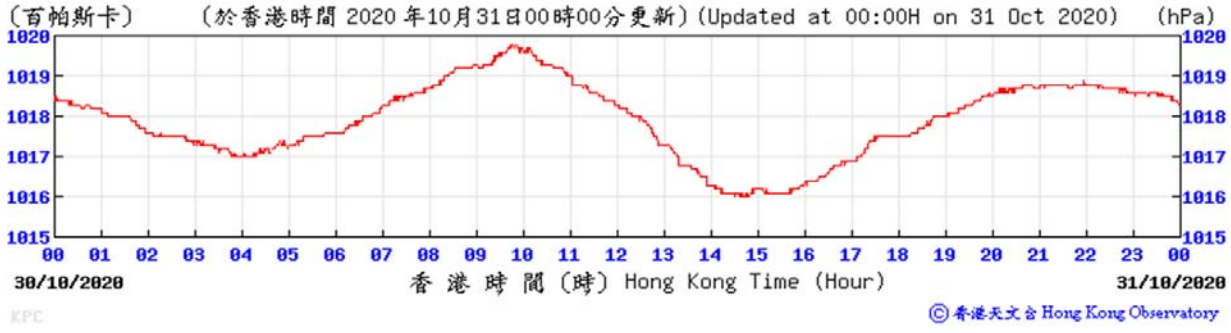

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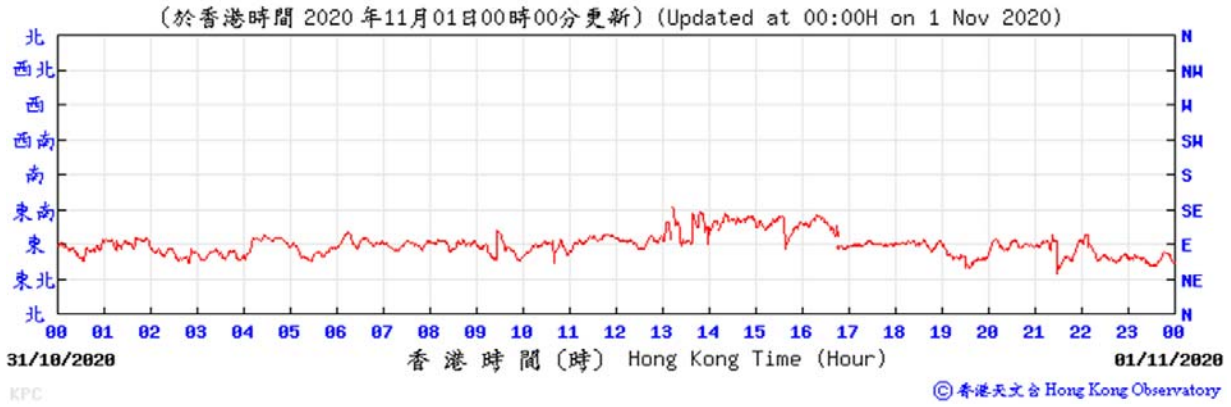

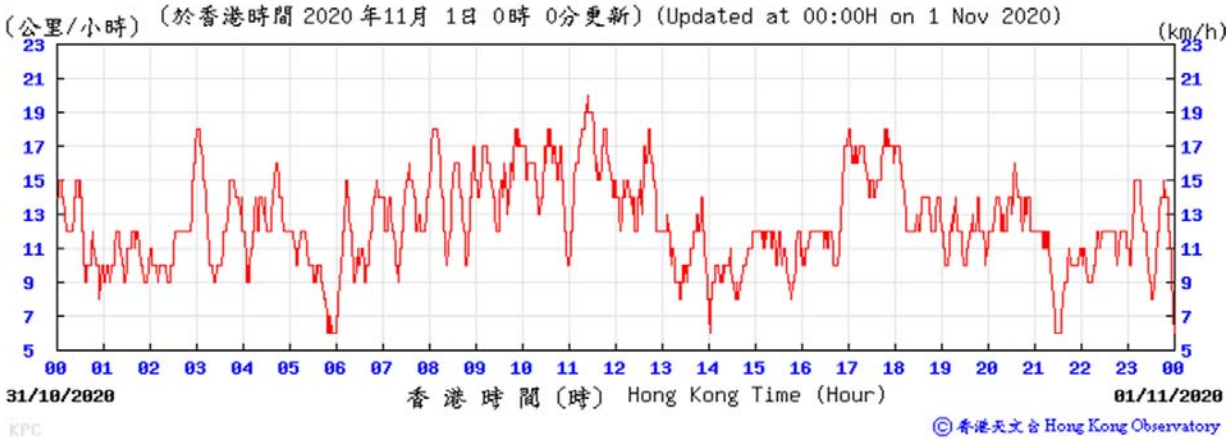

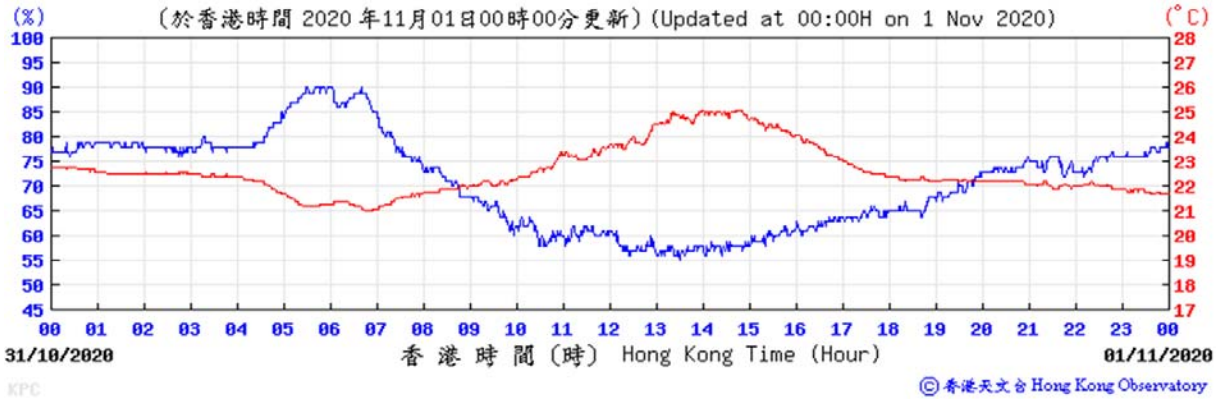

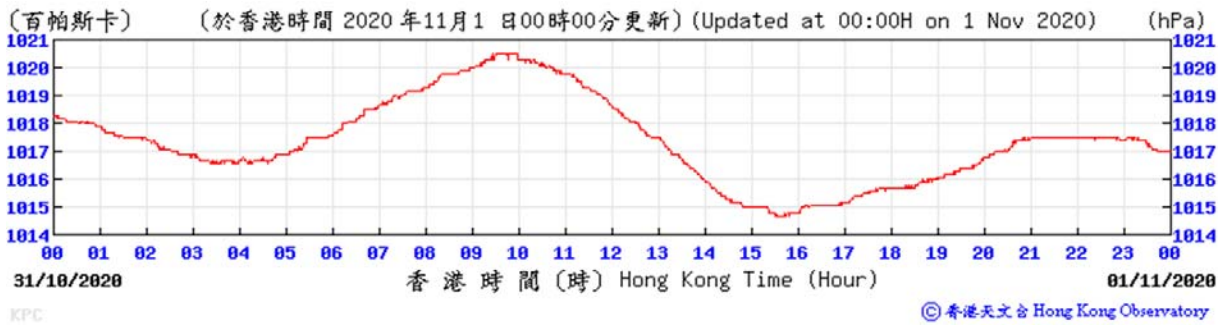

I. Waste Flow table

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 Sroting 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)
2020													
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													
Dec													
Sub-total (2020)	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

Note:

- 18.79 tonnes, 93.03 tonnes, 2511.66 tonnes of inert C&D material were disposed of as public fill to Chai Wan Public Fill Barging Point, 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 (Oct 2020)

EM&A Ref.	Recommendation Measures	Implementation Stage
Air Quality Impact (Construction)		
2.1	**General Dust Control Measures** 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	**Best Practice For Dust Control** 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: *Good Site Management* • 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. *Disturbed Parts of the Roads* • Each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or • Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet. *Exposed Earth* • 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.	Obs ✓ ✓ N/A No exposed earth in this project.

EM&A Ref.	Recommendation Measures	Implementation Stage
	Loading, Unloading or Transfer of Dusty Materials	✓
	• All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet.	
	Debris Handling	✓
	• Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides.	
	• Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped.	N/A No debris on-site
	Transport of Dusty Materials	✓
	• 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.	
	Wheel washing	✓
	• 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.	
	Use of vehicles	✓
	• 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.	
	• Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels.	✓
	• 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.	✓
	Site hoarding	✓
	• 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.	
2.1	**Best Practicable Means for Cement Works (Concrete Batching Plant)**	
	The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for	

EM&A Ref.	Recommendation Measures	Implementation Stage
	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:	
	Exhaust from Dust Arrestment Plant	N/A
	• 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	No concrete batching plant in this project.
	Emission Limits	N/A
	• All emissions to air, other than steam or water vapour, shall be colourless and free from persistent mist or smoke	No concrete batching plant in this project.
	Engineering Design/Technical Requirements	N/A
	• 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	No concrete batching plant in this project.
	Non-Road Mobile Machinery (NRMM): 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.	✓
Noise Impact (Construction)		
3.1	**Good Site Practice** 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:	
	• only well-maintained plant to be operated on-site and plant should be serviced regularly during the	✓

EM&A Ref.	Recommendation Measures	Implementation Stage
	construction works; • machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum • plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs; • mobile plant should be sited as far away from NSRs as possible; and • material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site construction activities.	✓ ✓ ✓ ✓
3.1	**Adoption of Quieter PME** 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 **Table 4.26** in the EIA report. It should be noted that the silenced PME selected for assessment can be found in Hong Kong.	✓
3.1	**Use of Movable Noise Barriers** 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.	Rem
3.1	**Use of Noise Enclosure/ Acoustic Shed** 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.	✓
3.1	**Use of Noise Insulating Fabric**	✓

EM&A Ref.	Recommendation Measures	Implementation Stage
	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	**Scheduling of Construction Works outside School Examination Periods** 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.	✓
Water Quality Impact (Construction)		
4.1	**Construction site runoff and drainage** 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: • 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; • 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.	✓ ✓

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.	
	• 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.	Obs
	• 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.	✓
	• 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.	✓
	• 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.	Obs
	• 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.	✓
	• Precautions should be taken at any time of the year when rainstorms are likely. Actions should be taken	Obs

EM&A Ref.	Recommendation Measures	Implementation Stage
	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.	
	• 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.	N/A No bentonite slurries are used in this project.
4.1	**Barging facilities and activities**	
	Recommendations for good site practices during operation of the proposed barging point include:	
	• 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;	N/A No barging facilities in this project at this stage.
	• 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;	N/A No barging facilities in this project at this stage.
	• All hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; and	N/A No barging facilities in this project at this stage.
	• Construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site.	N/A No barging facilities in this project at this stage.
4.1	**Sewage effluent from construction workforce**	✓

EM&A 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	**General construction activities**	
	• 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.	Obs
	• 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.	Obs
Waste Management Implications (Construction)		
6.1	**Good Site Practices**	
	Recommendations for good site practices during the construction activities include:	
	• Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site	✓
	• Training of site personnel in proper waste management and chemical handling procedures	✓
	• Provision of sufficient waste disposal points and regular collection of waste	✓
	• Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by either covering trucks or by transporting wastes in enclosed containers	✓
	• Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust	✓

EM&A Ref.	Recommendation Measures	Implementation Stage
	introduction to public roads	
	• Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting the inert or non-inert C&D materials is not anticipated	✓
6.1	**Waste Reduction Measures** Recommendations to achieve waste reduction include:	
	• Sort inert C&D material to recover any recyclable portions such as metals	✓
	• Segregation and storage of different types of waste in different containers or skips to enhance reuse or recycling of materials and their proper disposal	✓
	• 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	✓
	• Proper site practices to minimise the potential for damage or contamination of inert C&D materials	✓
	• Plan the use of construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of wastes	✓
6.1	**Inert and Non-inert C&D Materials** 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.	
	• The surplus inert C&D material will be disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong.	✓
	• Liaison with the CEDD Public Fill Committee (PFC) on the allocation of space for disposal of the inert C&D materials at PFRF is underway. No construction work is allowed to proceed until all issues on management of	✓

EM&A Ref.	Recommendation Measures	Implementation Stage
	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.	✓
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
	• 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.	✓
6.1	**General Refuse** 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.	✓
Land Contamination (Construction)		
7.1	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:	
	• To minimize the chance for construction workers to come into contact with any contaminated materials, bulk earth-moving excavation equipment should be employed;	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.
	• 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	N/A TST Fire Station is out of this project

EM&A Ref.	Recommendation Measures	Implementation Stage
	material), provision of washing facilities and prohibition of smoking and eating on site;	boundary, no mitigation measure is required.
	• Stockpiling of contaminated excavated materials on site should be avoided as far as possible;	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.
	• The use of contaminated soil for landscaping purpose should be avoided unless pre-treatment was carried out;	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.
	• Vehicles containing any contaminated excavated materials should be suitably covered to reduce dust emissions and/or release of contaminated wastewater;	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.
	• Truck bodies and tailgates should be sealed to stop any discharge;	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.
	• 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;	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.

EM&A Ref.	Recommendation Measures	Implementation Stage
	• Speed control for trucks carrying contaminated materials should be exercised;	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.
	• 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	N/A TST Fire Station is out of this project boundary, no mitigation measure is required.
	• Maintain records of waste generation and disposal quantities and disposal arrangements.	N/A 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 Compensatory tree planting is being reviewed.

EM&A Ref.	Recommendation Measures	Implementation Stage
Table 9.1 (CM3)	Buffer trees for screening purposes to soften the hard architectural and engineering structures and facilities.	N/A Roof garden is designed to be built, but it has not been completed yet.
Table 9.1 (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 Climbing or weeping plants are designed to be planted, but proposal is being reviewed for the planting location.
Table 9.1 (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 Roof garden is designed to be built, but it has not been completed yet.
Table 9.1 (CM6)	Sensitive streetscape design should be incorporated along all new roads and streets.	N/A Greening along the seafront is proposed, and under review.
Table 9.1 (CM7)	Structure, ornamental planting shall be provided along amenity strips to enhance the landscape quality.	N/A Gardens are designed to be built, and under review.
Table 9.1 (CM8)	Landscape design shall be incorporated to architectural and engineering structures in order to provide aesthetically pleasing designs.	N/A Roof garden is designed to be built, and under review.
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 No marine facilities for this

EM&A Ref.	Recommendation Measures	Implementation Stage
		project.
Table 9.2 (MCP1)	Use of decorative screen hoarding/boards	✓
Table 9.2 (MCP2)	Early introduction of landscape treatments	N/A No landscape treatments during this stage.
Table 9.2 (MCP3)	Adoption of light colour for the temporary ventilation shafts for the basement during the transition period.	N/A No ventilation shafts for this project.
Table 9.2 (MCP4)	Control of night time lighting	✓
Table 9.2 (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 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	0	0	0
From 03 October 2020 to end of the reporting month	0	0	0

End of the Report