

Contract No. 21/WSD/21

**Relocation of Diamond Hill Fresh Water and Salt Water Service Reservoirs
to Caverns**

Baseline Monitoring Report

Prepared for:

Water Supplies Department

Prepared by:

Acuity Sustainability Consulting Limited

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Certified by:



F. C. Tsang
Environmental Team Leader

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EXECUTIVE SUMMARY

In accordance with the approved Environmental Monitoring and Audit (EM&A) Manual for the Project (AEIAR-232/2021), baseline monitoring for air quality and noise should be conducted prior to the commencement of major construction works. Pursuant to Environmental Permit (EP-602/2021) Condition 3.3, Baseline Monitoring Report shall be submitted to the Director of Environmental Protection at least 2 weeks before the commencement of construction of the Project.

The baseline monitoring for 1-hour Total Suspended Particulate (TSP) monitoring was carried out between 27 February and 12 March 2023 and between 2 May and 16 May 2023. Baseline 1-hour TSP monitoring was conducted at least three times per day at each monitoring station during the daytime. Data collected were reviewed and analysed to establish the background air quality at five monitoring stations. **Table A1** summarizes the results of the baseline 1-hour TSP monitoring.

Table A1 Summary of Baseline 1-hour TSP Monitoring Results

Stations	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Sampling Parameter
DM-1	77	68 - 88	1-hour TSP
DM-2	60	49 - 69	
DM-3	61	53 - 69	
DM-4	69	49 - 85	
DM-4a	64	55 - 73	

The baseline 1-hour TSP monitoring results form the basis for determining the air quality criteria for the impact monitoring. Table A2 presents the Action and Limit Levels for impact monitoring of 1-hour TSP.

Table A2 Calculated Action and Limit Levels for 1-hour TSP

Stations	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
DM-1	300.1	500
DM-2	289.0	
DM-3	289.7	
DM-4	294.9	
DM-4a	291.6	

The baseline noise monitoring was carried out at three noise monitoring stations (NM-2, NM-3, NM-4a) between 27 February and 12 March 2023 according to the approved EM&A Manual. The baseline noise monitoring was carried out at the other three noise monitoring stations (NM-4, NM-5, NM-6) between 2 May and 16 May 2023. Data collected were reviewed and analysed to establish the background noise at these three monitoring stations. **Table A3** summarizes the results of the baseline noise monitoring.

Table A3 Summary of Daytime Baseline Noise Monitoring Results

Monitoring Station	Noise Level, dB(A)		
	<i>L_{eq}</i> (30-min)		
	Mean	Minimum	Maximum
NM-2	70.6	68.8	72.8
NM-3	65.2	63.6	66.8
NM-4	64.6	60.6	65.5
NM-4a	72.6	71.3	73.7
NM-5	65.3	63.9	67.6
NM-6	72.6	71.4	74.4

The Action and Limit Levels for construction noise monitoring are presented in **Table A4**.

Table A4 Action and Limit Levels for Construction Noise Monitoring

Monitoring Stations	Action Level	Limit Level	Time Period
NM-2	When one documented complaint is received	75 dB(A)	0700 - 1900 hours on normal weekdays
NM-3		70/ 65 dB(A) *	
NM-4		75 dB(A)	
NM-4a		75 dB(A)	

Note:

* Reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

1. INTRODUCTION

1.1 Project Background

1.1.1 The relocated Diamond Hill Fresh Water and Salt Water Service Reservoirs (DHSRs) will be constructed in a series of caverns linked by access tunnels and adits. The relocated Diamond Hill Fresh Water Service Reservoirs (DHFWSR) and Diamond Hill Salt Water Service Reservoirs (DHSWSR) will be compartmented while the existing Diamond Hill Pumping Station (DHPS) will be split into two (2) pump houses for fresh and salt water supply when relocated.

1.1.2 Ancillary facilities to be constructed near the tunnel portal may include transformer room, switch room, emergency generator room, control room, ventilation building, and pumping station control room, which will be constructed in an above-ground building outside the tunnel.

1.1.3 The scope of the Project comprises the following:

- a) Construction of the relocated DHSRs and associated pumping stations and water main laying works;
- b) Construction of tunnels, adits, ventilation system and caverns for accommodating the relocated DHSRs and the associated facilities;
- c) Terminating the operation of the existing DHSRs and the associated facilities; and
- d) All other associated works that are incidental to and necessary for the completion of the Project.

1.1.4 The major construction activities of the Project include earthworks, drilling and blasting, construction of concrete structures, handling and transportation of excavated materials, water mains laying, installation of electrical and mechanical (E&M) equipment and material transportation. The operation of the existing DHSRs and the associated facilities will be terminated after the completion of the testing and commissioning of the relocated DHSRs. Under the Project, the existing DHSRs and associated facilities will be retained after termination of the operation. The subsequent demolition works will be carried out by other government departments/ project proponents.

1.1.5 The Project is a Designated Project under Item Q.2, Part I of Schedule 2 of the Environmental Impact Assessment Ordinance, "Underground Rock Caverns", which requires an environmental permit from the Environmental Protection Department for its construction and operation.

1.1.6 Pursuant to the Environmental Impact Assessment Ordinance (EIAO), the Director of Environmental Protection Department (EPD) granted the Environmental Permits (EP-602/2021) to the Water Supplies Department (WSD) for the Project.

1.1.7 Acuity Sustainability Consulting Limited (ASCL) is commissioned by Chun Wo – Sinohydro Joint Venture to undertake the role of Environmental Team (ET) under

the Environmental Permit (EP) EP-602/2021, and to carry out the EM&A programme in fulfilment of the EM&A Manual, and other requirements stipulated in the associated EIA Report.

1.2 Purpose of Baseline Monitoring Report

- 1.2.1 The Baseline Monitoring Report is prepared in accordance with condition 3.2 of Environmental Permit No. EP-602/2021 and to fulfil the requirements of EM&A Manual for the Project. This Report presents the baseline monitoring requirement, methodologies, monitoring locations, parameter, criteria of air quality and noise monitoring and the baseline monitoring results collected at the air quality monitoring stations DM-1, DM-2, DM3, DM4 and DM-4a (**Table 2.2**), and noise monitoring stations NM-2, NM-3, NM-4, NM-4a, NM5 and NM6 (**Table 3.2**). Noise monitoring was not conducted at NM-1 due to access not granted by the management office of the premises.

2. AIR QUALITY MONITORING

2.1 Monitoring Requirements

2.1.1 In accordance with the EM&A Manual, baseline air quality monitoring shall be carried out at all of the designated monitoring locations for at least 14 consecutive days prior to the commissioning of major construction works to obtain 1-hour Total Suspended Particulates (TSP) samples. The selected baseline monitoring stations should reflect baseline conditions at the impact stations. One-hour sampling should be done at least 3 times per day while the highest dust impact is expected.

2.1.2 During the baseline monitoring, there should not be any major construction or dust generation activities in the vicinity of the monitoring stations.

2.2 Monitoring Locations

2.2.1 The proposed air quality monitoring locations during the baseline air quality monitoring are listed in **Table 2.1** and shown in **Figure 2.1**.

Table 2.1 Designated Air Quality Monitoring Locations proposed in the approved EM&A Manual

ID	ASR ID	Description
DM-1	ASR 2	Tennis Court near Tin Ma Court
DM-2	ASR 5	Chun Sing House, Tin Ma Court
DM-3	ASR 7	Grace Methodist Church Kindergarten
DM-4	ASR 9	Block 6, Tsui Chuk Garden

2.2.2 The Environmental Team (ET) had issued letters to the property management offices (MO) of the concerned premises to seek approval for setting up monitoring stations at the designated locations. While permissions of access have been obtained for ASR2, ASR5 and ASR7, no response was received from the MO of Tsui Chuk Garden before the deadline. To avoid delay in monitoring programme, air quality monitoring station DM-4 was proposed to relocate to Wang King House, Tin Wang Court (**Figure 2.2**) about 130 m south-east from DM-4. The alternative monitoring location (DM-4a) meets the following criteria of alternative monitoring location as stated in Section 4.6.3 of the EM&A Manual:

- i. At the site boundary or such locations close to the major dust emission source;
- ii. Close to the (planned) air sensitive receivers as defined in the EIAO-TM;
- iii. Proper position/ sitting and orientation of the monitoring equipment; and
- iv. Take into account the prevailing meteorological conditions.

2.2.3 Permission of access was later obtained from the Incorporated Owners of Tsui Chuk Garden in late February 2023, and the ET was advised to resume the baseline air quality monitoring at Block 6, Tsui Chuk Garden (DM-4), which was agreed by the EPD, the Engineer (ER) and the Independent Environmental Checker (IEC).

2.2.4 The updated air quality monitoring locations for baseline monitoring are listed in **Table 2.2** and presented in **Figure 2.2**.

Table 2.2 Updated Baseline Air Quality Monitoring Stations

ID	ASR ID	Description
DM-1	ASR 2	Tennis Court near Tin Ma Court
DM-2	ASR 5	Chun Sing House, Tin Ma Court
DM-3	ASR 7	Grace Methodist Church Kindergarten
DM-4	ASR 9	Block 6, Tsui Chuk Garden
DM-4a	ASR 8	Road pavement near Wang King House, Tin Wang Court

2.3 Air Quality Monitoring Parameter, Frequency and Duration

2.3.1 **Table 2.3** summarized the monitoring parameter, duration and frequency of baseline air quality monitoring.

Table 2.3 Baseline Monitoring Parameter, Frequency and Duration

Parameter	Frequency	Duration
1-hour TSP	3 times per day	Consecutive days of at least 2 weeks

2.4 Monitoring Equipment and Methodology and QA/ QC Procedure

Proposal of Using Portable Direct Reading Dust Meter

2.4.1 Direct reading dust meter were used for measuring 1-hour TSP levels during the baseline air quality monitoring. According to Section 4.4.1 of the EM&A Manual, the proposed use of direct reading dust meter was submitted to and agreed by the IEC.

2.4.2 Direct reading dust meters have been calibrated against high volume samplers (HVSs) annually. A 2-day, three 3-hour measurement results per day from direct reading dust meters were taken to compare the sampling results from the HVS. The correlation between the direct reading dust meters and the HVSs were then concluded. By accounting for the correlation factor, the direct reading dust meter is considered to achieve comparable results as those of the HVS.

2.4.3 The 1-hour TSP measurement follows the instruction provided in the manufacturer's manual. Before initiating a measurement, zeroing the portable dust meter was carried out to ensure the accuracy of each measurement.

2.4.4 Sufficient number of monitoring instruments were prepared by the ET for carrying out the baseline monitoring. All equipment and associated instrumentation were clearly labelled.

2.4.5 Equipment used in the baseline air quality monitoring programme is summarised in **Table 2.4**. Calibration certificates for the baseline air quality monitoring equipment are attached in **Appendix A**.

2.4.6 Wind data were collected from the records of Hong Kong Observatory Kai Tak Wind Station (22.30966N, 114.21336E), which is located at the south-eastern side of runway of the former Kai Tak Airport about 4.5 km south-east from the project site.

Table 2.4 Baseline Air Quality Monitoring Equipment

Equipment	Brand and Model	Serial No.	Calibration Due Date
Direct Reading Dust Meter	Sibata LD-5R	851820	15 October 2023
		882109	15 October 2023
	PC-3A(E)	JC-220710221	15 October 2023
		JC-2110283	15 October 2023

2.5 Results and Observation

2.5.1 The baseline air quality monitoring period for different monitoring stations are summarised in **Table 2.5** and the baseline monitoring schedules are presented in **Appendix B**.

Table 2.5 Baseline Air Quality Monitoring Period

Stations	Date
DM-1, DM-2, DM-3 and DM-4a	From 27 February to 12 March 2023
DM-4	From 2 May to 16 May 2023

Remark: Due to the inclement weather on 14 May 2023, baseline air quality monitoring at DM-4 was cancelled.

2.5.2 The baseline air quality monitoring results are summarized in **Table 2.6**. Details of air quality results are presented in **Appendix C**.

Table 2.6 Summary of Baseline 1-hour TSP Monitoring Results

Monitoring Stations	TSP Concentration, $\mu\text{g}/\text{m}^3$		
	Average	Minimum	Maximum
DM-1	77	68	88
DM-2	60	49	69
DM-3	61	53	69
DM-4	69	49	85
DM-4a	64	55	73

2.5.3 During the baseline monitoring, no construction activity of the Project was conducted in the vicinity of the monitoring locations and in the Project site.

Table 2.7 Influencing Factors at / near Air Quality Monitoring Stations

Monitoring Stations	Influencing Factors
DM-1	Road Traffic
DM-2	Road Traffic
DM-3	Road Traffic
DM-4	Not identified
DM-4a	Road Traffic

2.5.4 Extracts of wind data recorded at Kai Tak Wind Station available from the Hong Kong Observatory are presented in **Appendix E**.

2.6 Action and Limit Levels

2.6.1 The baseline 1-hour TSP monitoring results form the basis of determining the air quality criteria for the impact monitoring. **Table 2.8** shows the criteria for establishing the action and limit levels for air quality monitoring.

Table 2.8 Action and Limit Levels for Air Quality during Construction Period

Parameter	Action Level	Limit Level
1-hour TSP level in $\mu\text{g}/\text{m}^3$	For baseline level $\leq 384 \mu\text{g}/\text{m}^3$, action level = $(\text{baseline level} \times 1.3 + \text{limit level}) \div 2$ For baseline level $> 384 \mu\text{g}/\text{m}^3$, action level = limit level.	500 $\mu\text{g}/\text{m}^3$

2.6.2 Following the above guidelines, the action and limit levels for 1-hour TSP impact monitoring have been set and presented in **Table 2.9**.

Table 2.9 Calculated Action and Limit Levels for 1-hour TSP

Monitoring Stations	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
DM-1	300.1	500
DM-2	289.0	
DM-3	289.7	
DM-4	294.9	
DM-4a	291.6	

3. NOISE MONITORING

3.1 Monitoring Requirements

3.1.1 Baseline noise monitoring shall be carried out daily in all of the identified monitoring stations for at least 2 weeks prior to the commissioning of the construction works. During the baseline monitoring, there shall not be any construction activities in the vicinity of the monitoring stations. Any non-project related construction activities in the vicinity of the monitoring stations during the baseline monitoring should be noted and the source(s) and location(s) of such activities should be properly recorded.

3.2 Monitoring Locations

3.2.1 The proposed noise monitoring location during the baseline noise monitoring are listed in **Table 3.1** and shown in **Figure 3.1**.

Table 3.1 Designated Noise Monitoring Station proposed in the Approved EM&A Manual

ID	NSR ID	Description
NM-1	NSR 2	Block 1, Meridian Hill
NM-2	NSR 3	Chun Sing House, Tin Ma Court
NM-3	NSR 5	Grace Methodist Church Kindergarten
NM-4	NSR 7	Block 6, Tsui Chuk Garden

3.2.2 The ET has issued letters to the MO of the concerned premises to seek approval for setting up monitoring stations at the designated locations. While permission of access were obtained for NM-2 and NM-3, no response was received from the MO of Tsui Chuk Garden before the deadline. To avoid delay in monitoring programme, alternate monitoring location NM-4a, which is a road pavement near Wang King House, Tin Wang Court (**Figure 3.2**) about 130 m south-east from NM-4, was proposed.

3.2.3 The MO of Meridian Hill had rejected the ET's request to set up and carry out noise monitoring at Block 1, Meridian Hill (NM-1). Noise monitoring station at NM-1 was cancelled following discussion and agreement with the EPD and the IEC.

3.2.4 Permission of access has been obtained from the Incorporated Owners of Tsui Chuk Garden in late February 2023. The ET was advised to resume the baseline noise monitoring at Block 6, Tsui Chuk Garden (NM-4), which was agreed by the EPD, the ER and the IEC. Additional noise monitoring stations were also proposed by the ET at Wo Tin House, Shatin Pass Estate (NM-5) and Sheung Fung Street Customs Staff Quarter (NM-6) and were agreed by the IEC, the ER and the EPD.

3.2.5 The noise monitoring locations for baseline monitoring are listed in **Table 3.2**.

Table 3.2 Updated Baseline Noise Monitoring Station

ID	NSR ID	Description
NM-2	NSR 3	Chun Sing House, Tin Ma Court
NM-3	NSR 5	Grace Methodist Church Kindergarten
NM-4	NSR 7	Block 6, Tsui Chuk Garden
NM-4a	NSR 6	Road pavement near Wang King House, Tin Wang Court
NM-5	NSR 25	Wo Tin House, Shatin Pass Estate
NM-6	NSR P1	Sheung Fung Street Customs Staff Quarters

3.3 Noise Monitoring Parameter, Frequency and Duration

- 3.3.1 Baseline noise level was measured by the ET and measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}) over a 30-minute interval.
- 3.3.2 As supplementary information for data auditing, statistical results such as L_{10} and L_{90} were also obtained for reference.
- 3.3.3 **Table 3.3** summarized the monitoring parameters, duration, and frequency of baseline noise monitoring.

Table 3.3 Baseline Monitoring Parameter, Frequency and Duration

Parameters	Frequency and Duration
$L_{eq(30-min)}$ $L_{10(5-min)}$ $L_{90(5-min)}$	At least once per day between 07:00 and 19:00 for 14 consecutive days - ($L_{eq(30-min)}$) as an average of six consecutive L_{eq} over 5 minutes)

3.4 Monitoring Equipment, Methodology and QA / QC Procedure

- 3.4.1 As referred to the technical memorandum (TM) issued under the NCO, sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications were used for carrying out the baseline noise monitoring.
- 3.4.2 Noise measurements were not made in fog, rain, wind with a steady speed exceeding 5 m/s or wind with gusts exceeding 10 m/s. The wind speed was checked with a portable wind speed meter capable of measuring the wind speed in m/s.
- 3.4.3 Sufficient numbers of noise measuring equipment and associated instrumentation were prepared by the ET. All the equipment and associated instrumentation were clearly labelled.
- 3.4.4 Wind data were collected from the records of Hong Kong Observatory Kai Tak Wind Station (22.30966N, 114.21336E), which is located at the south-eastern side

of runway of the former Kai Tak Airport about 4.5 km south-east from the project site.

3.4.5 The monitoring procedures are as follows:

- For façade measurement, the monitoring station was set at a point 1 m from the exterior of the sensitive receivers building façade and set at a position 1.2 m above the ground. For free-field measurement, the monitoring station was set at a position 1.2 m above the ground.
- The battery condition was checked to ensure good functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the interval were set as follows:
 - Frequency weighting: A
 - Time weighting : Fast
 - Interval : 30 minutes ($L_{eq(30-min)}$) would be determined for daytime noise by calculating the logarithmic average of six $L_{eq(5-min)}$ data
- Prior to and after each noise measurement, the meter was calibrated using an acoustic calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement is more than 1.0 dB, the measurement was considered invalid and repeat of noise measurement will be required after re-calibration or repair of the equipment.
- At the end of the monitoring period, the values of L_{eq} , L_{90} and L_{10} were recorded. In addition, noise sources were recorded on a standard record sheet.

3.4.6 **Table 3.4** summarized the type of measurement undertaken in the six noise monitoring stations.

Table 3.4 Type of Noise Measurement

Monitoring Stations	Measurement
NM-2	Façade
NM-3	Façade
NM-4	Façade
NM-4a	Free field
NM-5	Façade
NM-6	Free field

3.4.7 **Table 3.5** summarized the noise monitoring equipment used during the baseline noise monitoring. Calibration certificates for the baseline noise monitoring equipment are attached in **Appendix A**.

Table 3.5 Baseline Noise Monitoring Equipment

Equipment	Model (Serial Number)	Calibration Due Date
Sound Level Meter	XL2 (A2A-09696-E0)	25 March 2023
		3 April 2024
Sound Calibrator	NC 75 (34724243)	4 July 2023

3.5 Maintenance and Calibration

3.5.1 Maintenance and calibration procedures are as follows:

- The microphone head of the sound level meter and calibrator were cleaned with a soft cloth; and
- The sound level meter and calibrator were calibrated annually by a HOKLAS laboratory or the manufacturer.

3.6 Results and Observations

3.6.1 The baseline noise monitoring period for different monitoring stations are summarised in **Table 3.6** and the baseline monitoring schedules are presented in **Appendix B**.

Table 3.6 Baseline Noise Monitoring Period

Stations	Date
NM-2, NM-3, and NM-4a	From 27 February to 12 March 2023
NM-4, NM-5, and NM-6	From 2 May to 16 May 2023

Remark: Due to the inclement weather on 14 May 2023, baseline noise monitoring at NM-4, NM5 and NM-6 were cancelled.

3.6.2 The baseline noise monitoring results are summarised in **Table 3.7**. Details of baseline noise monitoring results and graphic presentation of the data are given in **Appendix D**. Weather conditions recorded during the baseline monitoring period area shown in **Appendix E**.

Table 3.7 Summary of Daytime Baseline Noise Monitoring Results

Monitoring Station	Noise Level, dB(A)		
	<i>Leq</i> (30-min)		
	Mean	Minimum	Maximum
NM-2	70.6	68.8	72.8
NM-3	65.2	63.6	66.8
NM-4	64.6	60.6	65.5
NM-4a	72.6	71.3	73.7
NM-5	65.3	63.9	67.6
NM-6	72.6	71.4	74.4

3.6.3 During the baseline noise monitoring period, the influencing factors which may affect the results are summarized in **Table 3.8**.

Table 3.8 Influencing Factors at Noise Monitoring Stations

Monitoring Stations	Influencing Factors
NM-2	Road Traffic, other construction noise (Breaker)
NM-3	Road Traffic
NM-4	Road Traffic (fire truck alarm)
NM-4a	Road Traffic
NM-5	Road Traffic
NM-6	Road Traffic

3.7 Action and Limit Levels

3.7.1 The action and limit levels were established in accordance with the EM&A Manual. **Table 3.9** presents the Action and Limit Level for construction noise.

Table 3.9 Action and Limit Levels for Construction Noise Monitoring

Monitoring Stations	Action Level	Limit Level	Time Period
NM-2	When one documented complaint is received	75 dB(A)	0700 - 1900 hours on normal weekdays
NM-3		70/ 65 dB(A) *	
NM-4		75 dB(A)	
NM-4a		75 dB(A)	
NM-5		75 dB(A)	
NM-6		75 dB(A)	

Notes: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.

* Reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

4. CONCLUSION

4.1 Revision for inclusion in the EM&A Manual

- 4.1.1 The baseline monitoring was conducted according to the EM&A Manual for air quality and noise.
- 4.1.2 The monitoring methodology, parameters monitored, and monitoring location are all generally in line with the EM&A Manual for the Project.
- 4.1.3 Summary of revisions for inclusion in the EM&A Manual are shown in **Table 4.1**.

Table 4.1 Summary of Revisions for Inclusion in the EM&A Manual

Revision(s)	Details	Relevant Section(s) in this Baseline Monitoring Report
1	Due to no response was received from the MO of DM-4 - Block 6, Tsui Chuk Garden before the deadline, an alternative air quality monitoring station was proposed at road pavement near Wang King House, Tin Wang Court (DM-4a).	Section 2.2
2	Due to objection from MO of NM-1 - Block 1, Meridian Hill for setting up a noise monitoring station, noise monitoring was not conducted at the monitoring location.	Section 3.2
3	Due to no response was received from the MO of NM-4 - Block 6, Tsui Chuk Garden before the deadline, an alternative noise monitoring station was proposed at road pavement near Wang King House, Tin Wang Court (NM-4a).	Section 3.2
4	Permission of access has been obtained from the Incorporated Owners of Tsui Chuk Garden in late February 2023, air quality and noise monitoring were resumed at Block 6, Tsui Chuk Garden.	Sections 2.2 and 3.2
5	Two additional noise monitoring stations were proposed by the ET at Shatin Pass Estate and Sheung Fung Street Customs Staff Quarters, where the open trench method would be adopted in some of the watermains construction works.	Sections 2.2 and 3.2

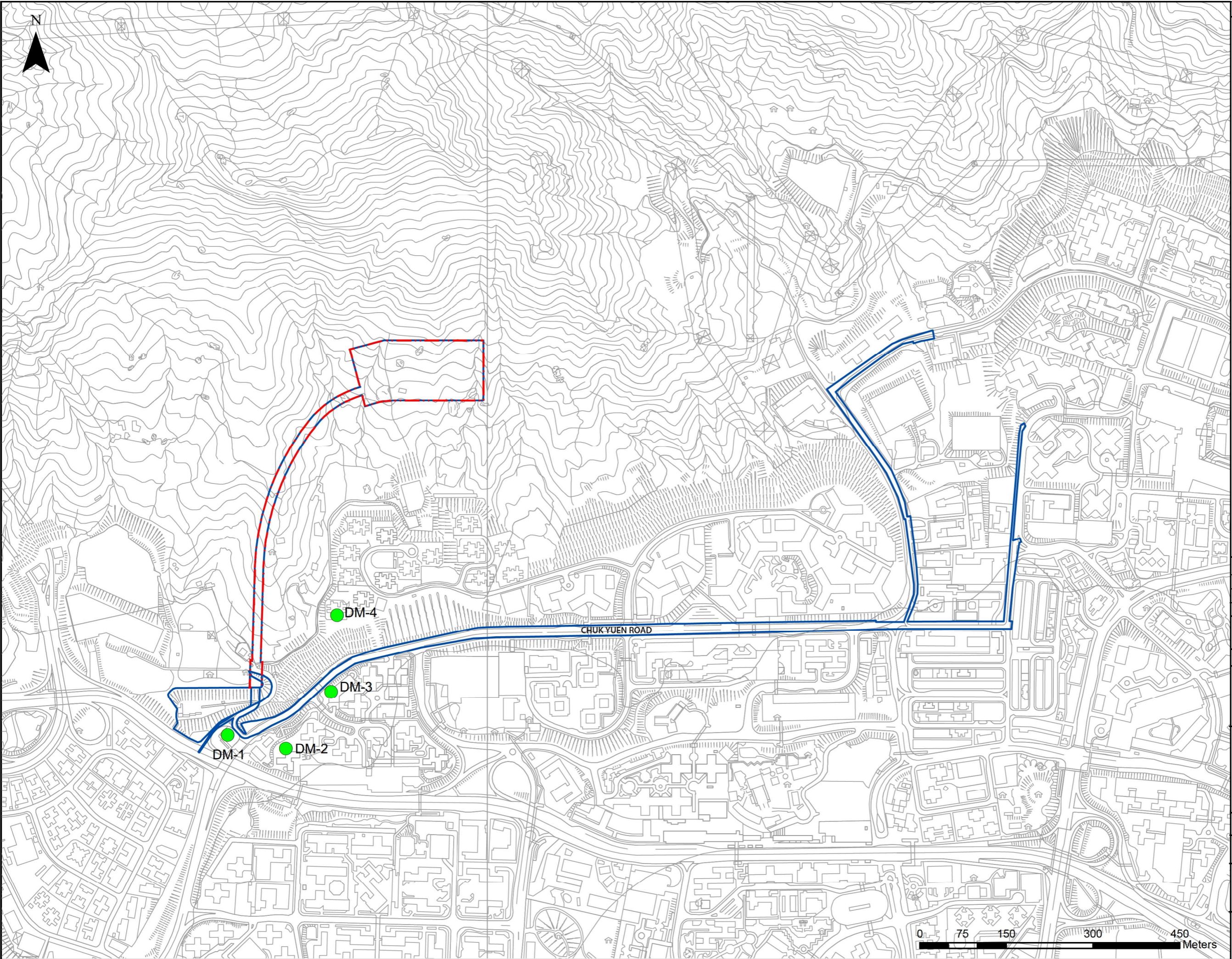
4.2 Air Quality

- 4.2.1 Baseline air quality monitoring at monitoring stations DM-1, DM-2, DM-3 and DM-4a were carried out between 27 February and 12 March 2023, and at monitoring station DM-4 between 2 May and 16 May 2023.
- 4.2.2 No major construction activity of the Project was conducted in the vicinity of the monitoring locations and in the Project site. Other influencing factors could be referred to **Table 2.7**.
- 4.2.3 The baseline air quality monitoring results were considered representative to the ambient air quality condition of the respective sensitive receivers.
- 4.2.4 Action and limit levels were derived based on the baseline 1-hour TSP monitoring results according to the EM&A Manual.

4.3 Noise

- 4.3.1 Baseline noise monitoring for noise monitoring stations NM-2, NM-3 and NM-4a were carried out between 27 February and 12 March, and at monitoring stations NM-4, NM-5 and NM-6 between 2 May 2023 and 16 May 2023.
- 4.3.2 No major construction activity of the Project was conducted in the vicinity of the monitoring locations and in the project site. Other influencing factors could be referred to **Table 3.8**.
- 4.3.3 The action and limit levels to be adopted for impact noise monitoring are presented in **Table 3.9**.
- 4.3.4 The baseline noise monitoring results are considered representative to the ambient noise level at all monitoring stations.

- Legend**
- PROJECT SITE BOUNDARY
 - - - CAVERN AND TUNNEL (UNDERGROUND)
 - CONSTRUCTION DUST MONITORING STATION



Revision	Description			
	Designed	Reviewed	Drawn	Checked
Initial	Wing	ET	Wing	ET
Date	05/21	05/21	05/21	05/21

Approved

Agreement No. **CE15/2018 (WS)**

Project Title
**RELOCATION OF DIAMOND HILL
 FRESH WATER AND SALT WATER
 SERVICE RESERVOIRS TO CAVERNS
 - INVESTIGATION, DESIGN AND
 CONSTRUCTION**

Figure Title
**LOCATION OF PROPOSED
 AIR QUALITY
 MONITORING STATION
 (CONSTRUCTION PHASE)**

Drawing No. **Figure 2.1** Revision

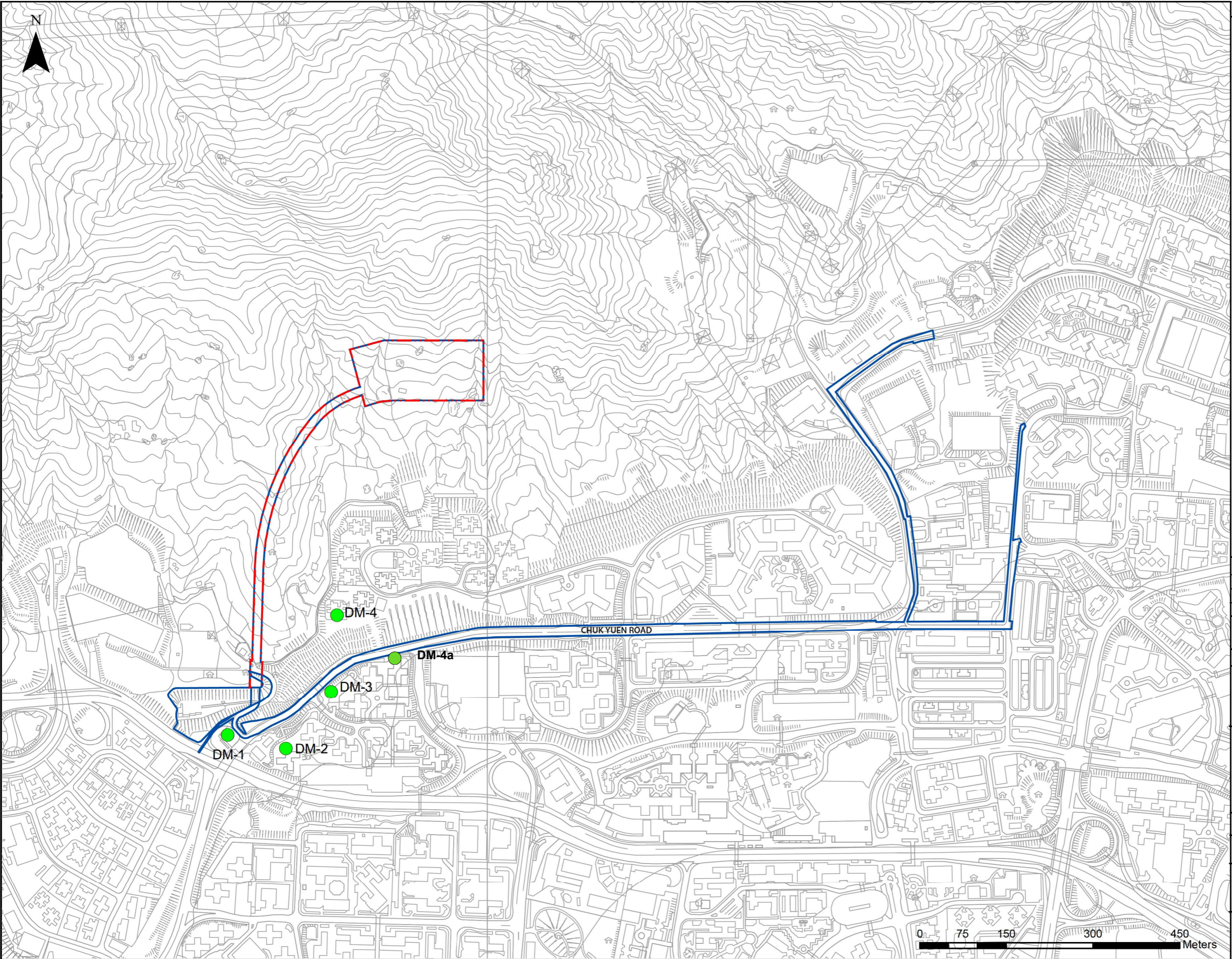
Scale **A3: 1:6,000**

Client
 **水務署
 Water Supplies
 Department**

Consultant

**BINNIES HONG KONG LIMITED
 寶尼新工程顧問有限公司**

- Legend**
- PROJECT SITE BOUNDARY
 - - - CAVERN AND TUNNEL (UNDERGROUND)
 - CONSTRUCTION DUST MONITORING STATION



Revision	Description			
	Designed	Reviewed	Drawn	Checked
Initial	Wing	ET	Wing	ET
Date	05/21	05/21	05/21	05/21

Approved

Agreement No. **CE15/2018 (WS)**

Project Title
**RELOCATION OF DIAMOND HILL
 FRESH WATER AND SALT WATER
 SERVICE RESERVOIRS TO CAVERNS
 - INVESTIGATION, DESIGN AND
 CONSTRUCTION**

Figure Title
**Location of Updated Air
 Quality Monitoring Stations**

Drawing No. **Figure 2.2** Revision

Scale
A3: 1:6,000

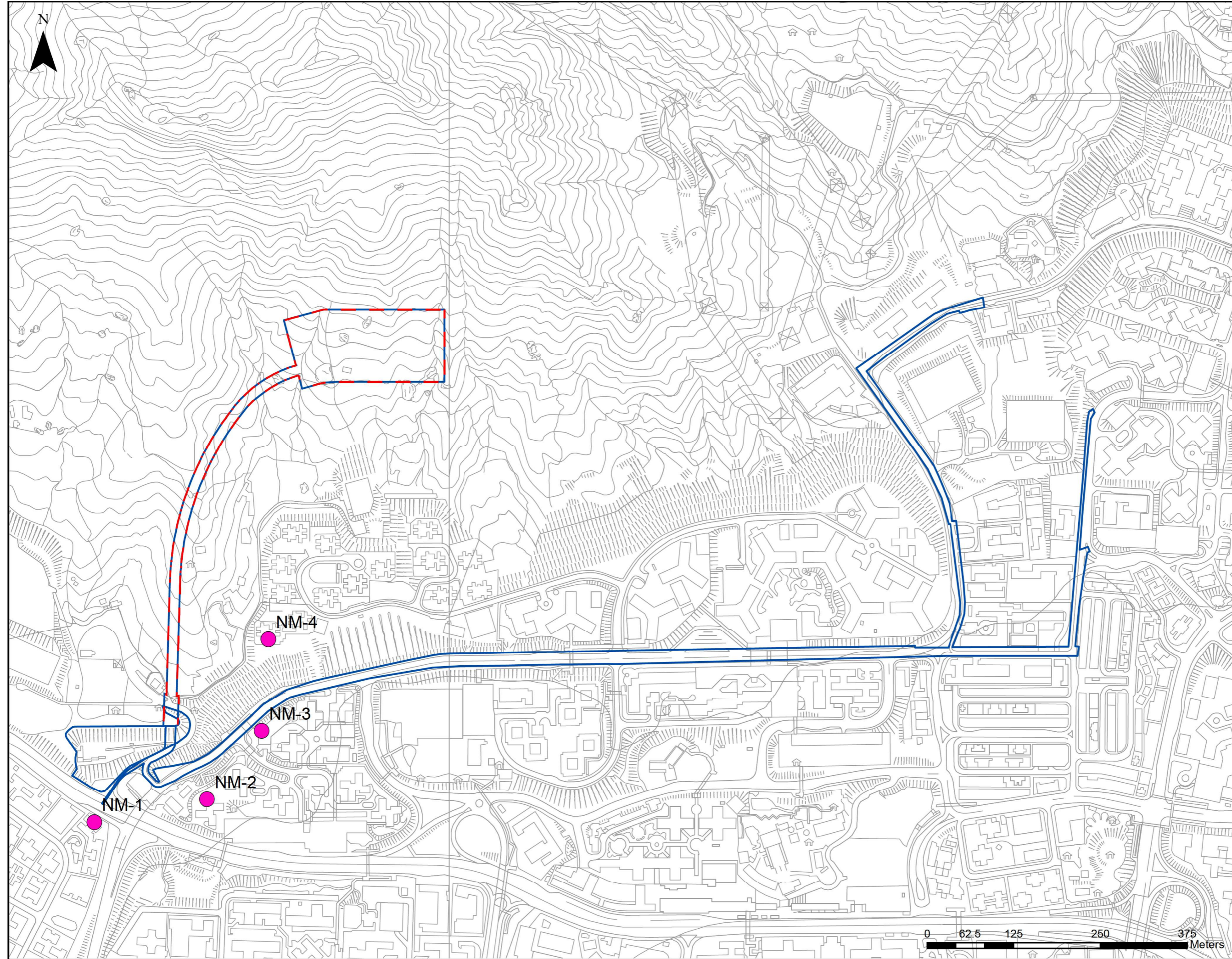
Client
 **水務署
 Water Supplies
 Department**

Consultant

**BINNIES HONG KONG LIMITED
 寶尼新工程顧問有限公司**

Legend

- PROJECT SITE BOUNDARY
- - - CAVERN AND TUNNEL (UNDERGROUND)
- CONSTRUCTION NOISE MONITORING STATION



Revision	Description			
	Designed	Reviewed	Drawn	Checked
Initial	Wing	ET	Wing	ET
Date	03/21	03/21	03/21	03/21

Approved

Agreement No. **CE15/2018 (WS)**

Project Title
**RELOCATION OF DIAMOND HILL
 FRESH WATER AND SALT WATER
 SERVICE RESERVOIRS TO CAVERNS
 - INVESTIGATION, DESIGN AND
 CONSTRUCTION**

Figure Title
**LOCATIONS OF PROPOSED
 CONSTRUCTION NOISE
 MONITORING STATIONS**

Drawing No. **Figure 3.1** Revision **B**

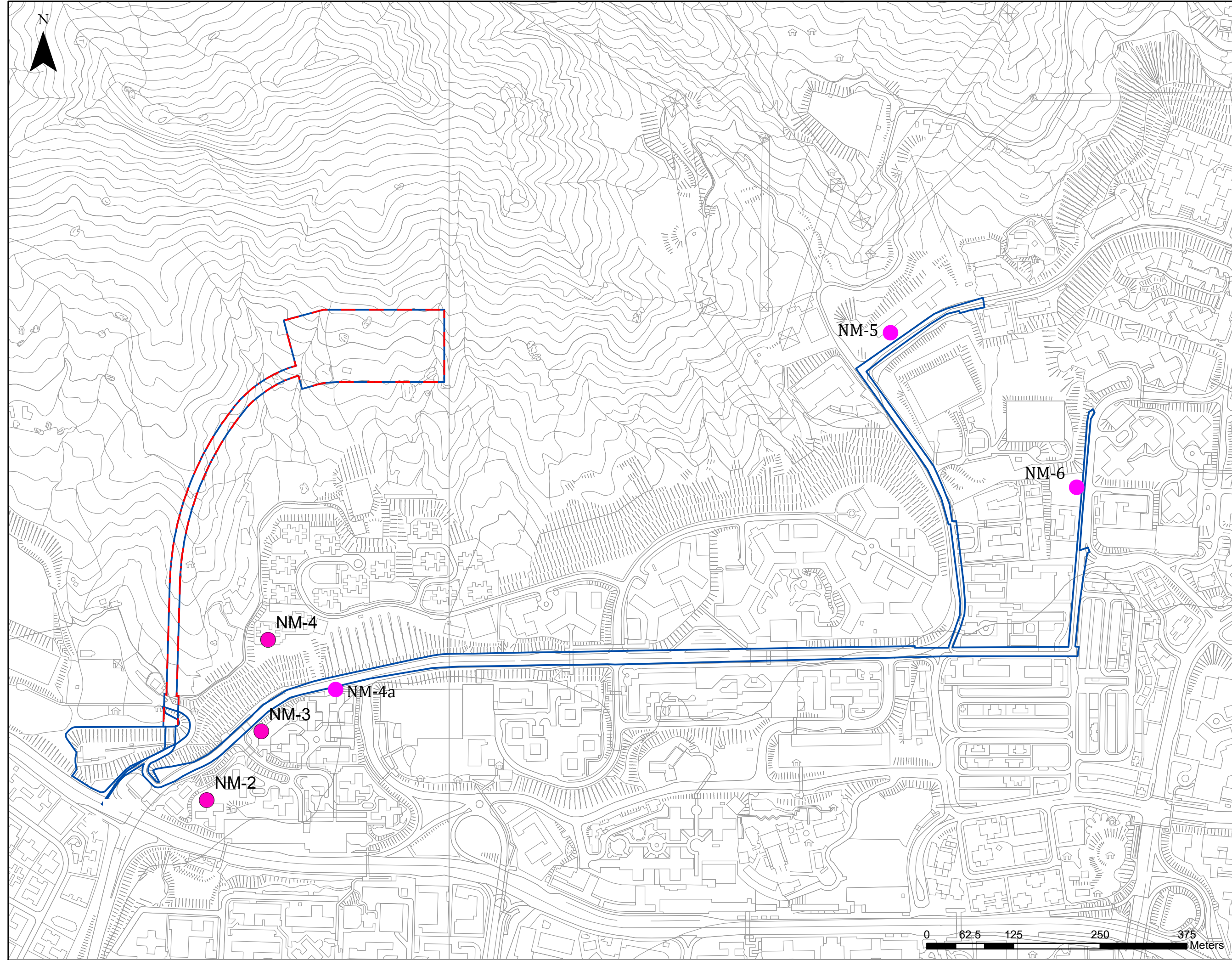
Scale **A3: 1:5,000**

Client
 **水務署
 Water Supplies
 Department**

Consultant
 **binnies**
 BINNIES HONG KONG LIMITED
 寶尼新工程顧問有限公司

Legend

- PROJECT SITE BOUNDARY
- - - CAVERN AND TUNNEL (UNDERGROUND)
- CONSTRUCTION NOISE MONITORING STATION



Revision	Description			
	Designed	Reviewed	Drawn	Checked
Initial	Wing	ET	Wing	ET
Date	03/21	03/21	03/21	03/21

Approved

Agreement No. **CE15/2018 (WS)**

Project Title
RELOCATION OF DIAMOND HILL FRESH WATER AND SALT WATER SERVICE RESERVOIRS TO CAVERNS - INVESTIGATION, DESIGN AND CONSTRUCTION

Figure Title
Locations of Updated Noise Monitoring Station

Drawing No. **Figure 3.2** Revision **B**

Scale
A3: 1:5,000

Client
 **水務署 Water Supplies Department**

Consultant

BINNIES HONG KONG LIMITED
 賓尼新工程顧問有限公司

Appendix A

Air Quality and Noise Monitoring Equipment Calibration Certificates



Website: www.acuityhk.com
 Unit C, 11/F, Ford Glory Plaza,
 Nos. 37-39 Wing Hong Street,
 Cheung Sha Wan, Kowloon.
 Tel. : (852) 2698 6833
 Fax.: (852) 2698 9383

Sibata LD-5R K-Factor Verification Test by Total Suspended Particulates HVS Test Report

Verification Test Date: 9-Oct-22 to 16-Oct-22
 Next Verification Test Date: 15-Oct-23
 Unit-under-Test- Model No. Sibata LD-5R
 Unit-under-Test Serial No. 851820
 Our Report Reference No. RPT-22-HVS-0019

Standard Equipment Information			
Verification Equipment Type	Tisch TSP	Tisch HVS	
	HVS	Calibrator	
Standard Equipment Model No.	TE-5170X	TE-5025A	
Equipment serial no.	MFC 1049	3465	
Last Calibration Date	28-Sep-22	28-Jun-22	
Next Calibration Date	28-Nov-22	29-Jun-23	

Verification Test No.	Date	Time			K-Factor	Counts/Minute (R)	Total Counts (TC)	TSP Sample ID No.	Dust Concentration (ug/m3), (C)
		Start-time	End-time	Elapsed Time (in min)					
1	9/10/2022	6210.34	6213.34	180.00	0.00122	28.00	5040	R221670/1	34
2	9/10/2022	6213.34	6216.36	181.20	0.00103	64.00	11597	R221670/2	66
3	9/10/2022	6216.36	6221.78	325.20	0.00120	85.67	27859	R221670/3	103
4	16/10/2022	6249.91	6252.92	180.60	0.00102	53.00	9571.8	R221671/1	54
5	16/10/2022	6252.92	6255.92	180.00	0.00114	77.33	13920	R221671/2	88
6	16/10/2022	6255.92	6261.94	361.20	0.00116	71.33	25766	R221671/3	83
					0.00113				

K-Factor to be inputted in LD-5R (corrected 1 decimal point): 1.1

By Linear Regression of y on x:

slope, mh= 1.1948

intercept, ch= -4.2432

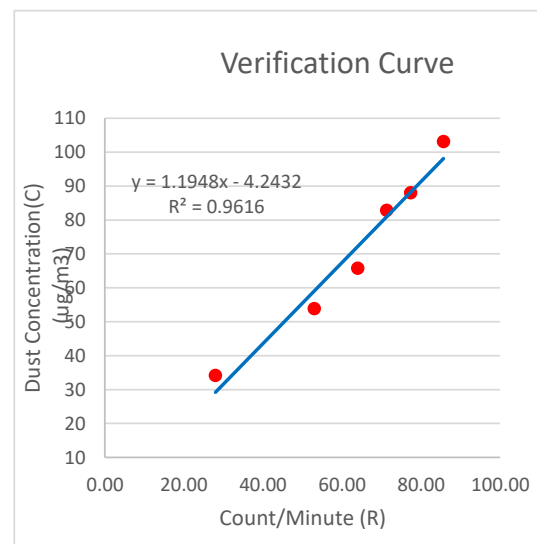
*Correlation Coefficient, R= 0.9806

Verification Test Result: Strong Correlation. Results were accepted.

* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.

Verified By: 
 Field Supervisor

Date: 19-10-2022



Sibata LD-5R K-Factor Verification Test by Total Suspended Particulates HVS Test Report

Verification Test Date: 9-Oct-22 to 16-Oct-22
 Next Verification Test Date: 15-Oct-23
 Unit-under-Test- Model No. Sibata LD-5R
 Unit-under-Test Serial No. 882109
 Our Report Reference No. RPT-22-HVS-0015

Standard Equipment Information			
Verification Equipment Type	Tisch TSP	Tisch HVS	
	HVS	Calibrator	
Standard Equipment Model No.	TE-5170X	TE-5025A	
Equipment serial no.	MFC 1049	3465	
Last Calibration Date	28-Sep-22	28-Jun-22	
Next Calibration Date	28-Nov-22	29-Jun-23	

Verification Test No.	Date	Time			K-Factor	Counts/Minute (R)	Total Counts (TC)	TSP Sample ID No.	Dust Concentration (ug/m3), (C)
		Start-time	End-time	Elapsed Time (in min)					K-Factor (K=C/R)
1	9/10/2022	6210.34	6213.34	180.00	0.00083	41.00	7380	R221670/1	34
2	9/10/2022	6213.34	6216.36	181.20	0.00100	65.67	11899	R221670/2	66
3	9/10/2022	6216.36	6221.78	325.20	0.00107	96.33	31328	R221670/3	103
4	16/10/2022	6249.91	6252.92	180.60	0.00104	52.00	9391.2	R221671/1	54
5	16/10/2022	6252.92	6255.92	180.00	0.00122	72.33	13020	R221671/2	88
6	16/10/2022	6255.92	6261.94	361.20	0.00113	73.00	26368	R221671/3	83
					0.00105				

K-Factor to be inputted in LD-5R (corrected 1 decimal point): 1.0

By Linear Regression of y on x:


slope, mh= 1.2732

intercept, ch= -13.6573

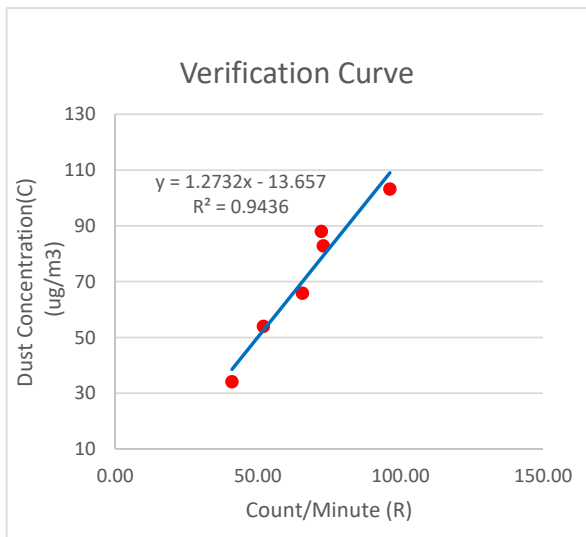
*Correlation Coefficient, R= 0.9714

Verification Test Result: Strong Correlation. Results were accepted.

* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.

Verified By: 
 Field Supervisor

Date: 19-10-2022



PC-3A(E) K-Factor Verification Test by Total Suspended Particulates HVS Test Report

Verification Test Date: 9-Oct-22 to 16-Oct-22
 Next Verification Test Date: 8-Oct-23
 Unit-under-Test- Model No. PC-3A(E)
 Unit-under-Test Serial No. JC-220710221
 Our Report Reference No. RPT-22-HVS-0033
 Calibration Location: Emax

Standard Equipment Information			
Verification Equipment Type	Tisch TSP	Tisch HVS	
	HVS	Calibrator	
Standard Equipment Model No.	TE-5170X	TE-5025A	
Equipment serial no.	MFC 1049	3465	
Last Calibration Date	28-Sep-22	28-Jun-22	
Next Calibration Date	28-Nov-22	29-Jun-23	

Verification Test No.	Date	Time			K-Factor	Counts/Minute (R)	Total Counts (TC)	TSP Sample ID No.	Dust Concentration (ug/m3), (C)	
		Start-time	End-time	Elapsed Time (in min)						K-Factor (K=C/R)
1	9/10/2022	6210.34	6213.34	180.00	0.00088	39	6960	R221670/1	34	
2	9/10/2022	6213.34	6216.36	181.20	0.00094	70	12624	R221670/2	66	
3	9/10/2022	6216.36	6221.78	325.20	0.00094	109	35555	R221670/3	103	
4	16/10/2022	6249.91	6252.92	180.60	0.00094	57	10354	R221671/1	54	
5	16/10/2022	6252.92	6255.92	180.00	0.00095	92	16620	R221671/2	88	
6	16/10/2022	6255.92	6261.94	361.20	0.00095	87	31545	R221671/3	83	
					0.00094					

K-Factor to be inputted in PC-3A(E) (corrected 1 decimal point): 0.94

By Linear Regression of y on x:

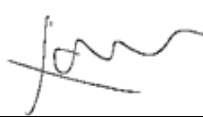
slope, mh= 0.9766

intercept, ch= -2.7104

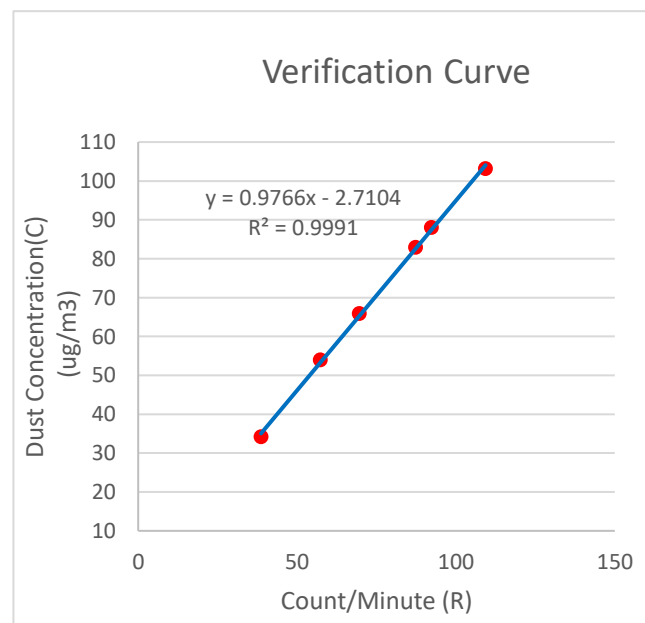
*Correlation Coefficient, R= 0.9996

Verification Test Result: Strong Correlation. Results were accepted.

* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.

Verified By: 
 Field Supervisor

Date: 19-10-2022





Website: www.acuityhk.com
 Unit C, 11/F, Ford Glory Plaza,
 Nos. 37-39 Wing Hong Street,
 Cheung Sha Wan, Kowloon.
 Tel. : (852) 2698 6855
 Fax.: (852) 2698 9383

PC-3A(E) K-Factor Verification Test by Total Suspended Particulates HVS Test Report

Verification Test Date: 9-Oct-22 to 16-Oct-22
 Next Verification Test Date: 15-Oct-23
 Unit-under-Test- Model No. PC-3A(E)
 Unit-under-Test Serial No. JC-2110283
 Our Report Reference No. RPT-22-HVS-0022

Standard Equipment Information			
Verification Equipment Type	Tisch TSP	Tisch HVS	
	HVS	Calibrator	
Standard Equipment Model No.	TE-5170X	TE-5025A	
Equipment serial no.	MFC 1049	3465	
Last Calibration Date	28-Sep-22	28-Jun-22	
Next Calibration Date	28-Nov-22	29-Jun-23	

Verification Test No.	Date	Time			K-Factor	Counts/Minute (R)	Total Counts (TC)	TSP Sample ID No.	Dust Concentration (ug/m3), (C)
		Start-time	End-time	Elapsed Time (in min)					
1	9/10/2022	6210.34	6213.34	180.00	0.00085	40.33	7260	R221670/1	34
2	9/10/2022	6213.34	6216.36	181.20	0.00100	65.67	11899	R221670/2	66
3	9/10/2022	6216.36	6221.78	325.20	0.00112	92.33	30027	R221670/3	103
4	16/10/2022	6249.91	6252.92	180.60	0.00097	55.33	9993.2	R221671/1	54
5	16/10/2022	6252.92	6255.92	180.00	0.00098	89.67	16140	R221671/2	88
6	16/10/2022	6255.92	6261.94	361.20	0.00098	84.33	30461	R221671/3	83
					0.00098				

K-Factor to be inputted in PC-3A(E) (corrected 1 decimal point): 1.0

By Linear Regression of y on x:


slope, mh= 1.1781

intercept, ch= -12.6747

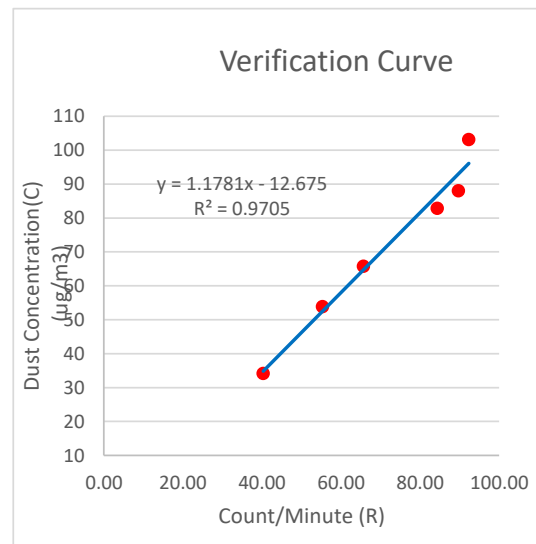
*Correlation Coefficient, R= 0.9852

Verification Test Result: Strong Correlation. Results were accepted.

* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.

Verified By: 
 Field Supervisor

Date: 19-10-2022



Certificate of Calibration

for

Description: *Sound Level Meter*
Manufacturer: *NTi Audio*
Type No.: *XL2 (Serial No.: A2A-09696-E0)*
Microphone: *ACO 7052 (Serial No.:68840)*
Preamplifier: *NTi Audio M2211 MA220 (Serial No.:5287)*

Submitted by:

Customer: *Acumen Environmental Engineering and Technologies Co. Ltd.*

Address: *Unit D, 12/F, Ford Glory Plaza,
Nos. 37-39 Wing Hong Street,
Cheung Sha Wan, Kowloon, Hong Kong*

Upon receipt for calibration, the instrument was found to be:

- Within
 Outside

the allowable tolerance.

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

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

Date of receipt: 24 March 2022

Date of calibration: 26 March 2022

Calibrated by: _____
Calibration Technician

Certified by: _____
*Mr. Ng Yan Wa
Laboratory Manager*

Date of issue: 26 March 2022



Certificate No.: APJ21-161-CC001

Page 1 of 4

1. Calibration Precaution:

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.

2. Calibration Conditions:

Air Temperature: 22.6 °C
 Air Pressure: 1006 hPa
 Relative Humidity: 74.5 %

3. Calibration Equipment:

	Type	Serial No.	Calibration Report Number	Traceable to
Multifunction Calibrator	B&K 4226	2288467	AV200041	HOKLAS

4. Calibration Results

Sound Pressure Level

Reference Sound Pressure Level

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA SPL	Fast	94	1000	94.1	±0.4

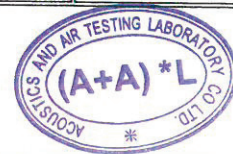
Linearity

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA SPL	Fast	94	1000	94.1	Ref
			104		104.1	±0.3
			114		114.1	±0.3

Time Weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA SPL	Fast	94	1000	94.1	Ref
		Slow			94.1	±0.3

Certificate No.: APJ21-161-CC001



Page 2 of 4

Frequency Response

Linear Response

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB	
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz			
30-130	dB	SPL	Fast	94	31.5	94.0	±2.0
					63	94.1	±1.5
					125	94.1	±1.5
					250	94.0	±1.4
					500	94.1	±1.4
					1000	94.1	Ref
					2000	94.3	±1.6
					4000	94.9	±1.6
				8000	93.6	+2.1; -3.1	

A-weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB	
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz			
30-130	dBA	SPL	Fast	94	31.5	54.7	-39.4±2.0
					63	67.9	-26.2±1.5
					125	78.0	-16.1±1.5
					250	85.4	-8.6±1.4
					500	90.9	-3.2±1.4
					1000	94.1	Ref
					2000	95.5	+1.2±1.6
					4000	95.9	+1.0±1.6
				8000	92.5	-1.1+2.1; -3.1	

C-weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB	
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz			
30-130	dBC	SPL	Fast	94	31.5	91.0	-3.0±2.0
					63	93.2	-0.8±1.5
					125	93.9	-0.2±1.5
					250	94.0	-0.0±1.4
					500	94.1	-0.0±1.4
					1000	94.1	Ref
					2000	94.1	-0.2±1.6
					4000	94.1	-0.8±1.6
				8000	90.6	-3.0+2.1; -3.1	

Certificate No.: APJ21-161-CC001



Page 3 of 4

5. Calibration Results Applied

The results apply to the particular unit-under-test only. All calibration points are within manufacture's specification as IEC 61672 Class 1.

Uncertainties of Applied Value:

94 dB	31.5 Hz	± 0.05
	63 Hz	± 0.05
	125 Hz	± 0.05
	250 Hz	± 0.05
	500 Hz	± 0.05
	1000 Hz	± 0.05
	2000 Hz	± 0.05
	4000 Hz	± 0.05
	8000 Hz	± 0.10
104 dB	1000 Hz	± 0.05
114 dB	1000 Hz	± 0.05

The uncertainties are evaluated for a 95% confidence level.

Note:

The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. (A+A)*L shall not be liable for any loss or damage resulting from the use of the equipment.

Certificate of Calibration

for

Description: Sound Level Meter
Manufacturer: NTi Audio
Type No.: XL2 (Serial No.: A2A-09696-E0)
Microphone: ACO 7052 (Serial No.:68914)
Preamplifier: NTi Audio MA220 (Serial No.:10390)

Submitted by:

Customer: Acuity Sustainability Consulting Limited
Address: Unit E, 12/F, Ford Glory Plaza,
Nos. 37-39 Wing Hong Street,
Cheung Sha Wan, Kowloon, Hong Kong

Upon receipt for calibration, the instrument was found to be:

- Within (31.5Hz – 4kHz)
 Outside

the allowable tolerance.

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

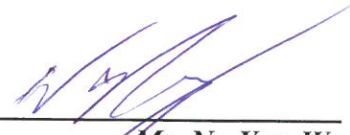
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

Date of receipt: 30 March 2023

Date of calibration: 04 April 2023

Date of NEXT calibration: 03 April 2024

Calibrated by: 
Calibration Technician

Certified by: 
Mr. Ng Yan Wa
Laboratory Manager

Date of issue: 04 April 2023

Certificate No.: APJ22-164-CC002



Page 1 of 4

**1. Calibration Precaution:**

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.

2. Calibration Conditions:

Air Temperature: 21.5 °C
 Air Pressure: 1005 hPa
 Relative Humidity: 71.4 %

3. Calibration Equipment:

	Type	Serial No.	Calibration Report Number	Traceable to
Multifunction Calibrator	B&K 4226	2288467	AV220061	HOKLAS

4. Calibration Results

Sound Pressure Level

Reference Sound Pressure Level

Setting of Unit-under-test (UUT)				Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting		Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA	SPL	Fast	94	1000	94.1	±0.4

Linearity

Setting of Unit-under-test (UUT)				Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting		Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA	SPL	Fast	94	1000	94.1	Ref
				104		104.1	±0.3
				114		114.1	±0.3

Time Weighting

Setting of Unit-under-test (UUT)				Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting		Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA	SPL	Fast	94	1000	94.1	Ref
			Slow			94.1	±0.3

Certificate No.: APJ22-164-CC002



Page 2 of 4

Frequency Response

Linear Response

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB	
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz			
30-130	dB	SPL	Fast	94	31.5	94.3	±2.0
					63	94.3	±1.5
					125	94.3	±1.5
					250	94.2	±1.4
					500	94.2	±1.4
					1000	94.1	Ref
					2000	93.8	±1.6
					4000	93.1	±1.6

A-weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB	
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz			
30-130	dBA	SPL	Fast	94	31.5	55.0	-39.4 ±2.0
					63	68.2	-26.2 ±1.5
					125	78.2	-16.1 ±1.5
					250	85.6	-8.6 ±1.4
					500	91.0	-3.2 ±1.4
					1000	94.1	Ref
					2000	95.0	+1.2 ±1.6
					4000	94.1	+1.0 ±1.6

C-weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB	
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz			
30-130	dBC	SPL	Fast	94	31.5	91.3	-3.0 ±2.0
					63	93.5	-0.8 ±1.5
					125	94.1	-0.2 ±1.5
					250	94.2	-0.0 ±1.4
					500	94.2	-0.0 ±1.4
					1000	94.1	Ref
					2000	93.6	-0.2 ±1.6
					4000	92.3	-0.8 ±1.6



Certificate No.: APJ22-164-CC002

Page 3 of 4

5. Calibration Results Applied

The results apply to the particular unit-under-test only. All calibration points are within manufacture's specification as IEC 61672 Class 1.

Uncertainties of Applied Value:

94 dB	31.5 Hz	± 0.15
	63 Hz	± 0.10
	125 Hz	± 0.05
	250 Hz	± 0.05
	500 Hz	± 0.05
	1000 Hz	± 0.05
	2000 Hz	± 0.05
	4000 Hz	± 0.05
104 dB	1000 Hz	± 0.05
114 dB	1000 Hz	± 0.05

The uncertainties are evaluated for a 95% confidence level.

Note:

The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. (A+A)*L shall not be liable for any loss or damage resulting from the use of the equipment.



CALIBRATION CERTIFICATE

Product : SOUND CALIBRATOR
 Type : NC-75
 Serial number : 34724243
 Manufacturer : RION CO., LTD.
 Calibration quantities : Sound pressure level (with reference standard microphone)
 Calibration method : Measured by specified secondary standard microphone
 according to JCSS calibration procedure specified by RION.
 Ambient conditions : Temperature 23.9 °C, Relative humidity 49 %,
 Static pressure 99.9 kPa
 Calibration date : 05/07/2022 (DD/MM/YYYY)
 Calibration location : 3-20-41 Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan
 RION CO., LTD. Calibration Room

We hereby certify that the results of this calibration were as follows.

Issue date : 11/07/2022 (DD/MM/YYYY)

Junichi Kawamura
 Manager
 Quality Assurance Section,
 Quality Assurance Department,
 Environmental Instrument Division,
 RION CO., LTD.
 3-20-41 Higashimotomachi, Kokubunji,
 Tokyo 185-8533, Japan



This certificate is based on article 144 of the Measurement Law and indicates the result of calibration in accordance with measurement standards traceable to Primary Measurement Standards (National Standards) which realizes the physical units of measurement according to the International System of Units (SI).

The accreditation symbol is attestation of which the result of calibration is traceable to Primary Measurement Standards (National Standards).

The certificate shall not be reproduced except in full, without the written approval of the issuing laboratory.

The calibration laboratory who issued this calibration certificate conforms to ISO/IEC 17025:2017.

This calibration certificate was issued by the calibration laboratory accredited by IAJapan who is a signatory to the Mutual Recognition Arrangement (MRA) of International Laboratory Accreditation Cooperation (ILAC) and Asia Pacific Accreditation Cooperation (APAC). This (These) calibration result(s) may be accepted internationally through ILAC/APAC MRA.

CALIBRATION RESULT

1. Sound pressure level (with reference standard microphone)

Measured value	Expanded uncertainty *1
93.99 dB	0.09 dB

Specified secondary standard microphone:

Type : 4160
 Serial number : 2973341
 Reference Sound pressure : 2×10^{-5} Pa

*1 Defines an interval estimated to have a level of confidence of approximately 95 %.

Coverage factor $k=2$

Calibration result is the calibration value in ambient conditions during calibration.

BE OUT OF JCSS CALIBRATION

1. Frequency

Measured value	Measurement uncertainty ($k=2$)
1000.0 Hz	3.9×10^{-4} Hz

Working measurement standard universal counter:

Type : 53132A
 Serial number : MY40005574
 (JCSS Calibration Certificate No. 21081499079575510)

2. Total distortion

Measured value
0.2 %

Working measurement standard distortion meter:

Type : VA-2230A
 Serial number : 11076061
 (A2LA Calibration Certificate No. 1501-03080)

- closing -

Appendix B

Baseline Monitoring Schedule

Baseline Environmental Monitoring Schedule

February 2023						
Sun	Mon	Tue	Wed	Thur	Fri	Sat
			1	2	3	4
5			8	9	10	11
12			15	16	17	18
19			22	23	24	25
26	27 Baseline Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4a, NM-2, NM-3, NM-4a)	28 Baseline Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4a, NM-2, NM-3, NM-4a)				
March 2023						
Sun	Mon	Tue	Wed	Thur	Fri	Sat
			1 Baseline Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4a, NM-2, NM-3, NM-4a)	2 Baseline Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4a, NM-2, NM-3, NM-4a)	3 Baseline Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4a, NM-2, NM-3, NM-4a)	4 Baseline Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4a, NM-2, NM-3, NM-4a)
5	6 Baseline Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4a, NM-2, NM-3, NM-4a)	7 Baseline Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4a, NM-2, NM-3, NM-4a)	8 Baseline Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4a, NM-2, NM-3, NM-4a)	9 Baseline Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4a, NM-2, NM-3, NM-4a)	10 Baseline Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4a, NM-2, NM-3, NM-4a)	11 Baseline Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4a, NM-2, NM-3, NM-4a)
12	13 Baseline Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4a, NM-2, NM-3, NM-4a)					
19						
26			29	30	31	
Air Quality Monitoring Station: DM-1 - Tennis Court near Tin Ma Court DM-2 - Chun Sing House, Tin Ma Court DM-3 - Grace Methodist Church Kindergarten DM-4a - Road pavement near Wang King House, Tin Wang Court			Noise Monitoring Station: NM-2 - Chun Sing House, Tin Ma Court NM-3 - Grace Methodist Church Kindergarten NM-4a - Road pavement near Wang King House, Tin Wang Court			

Contract No. 21/WSD/21
Relocation of Diamond Hill Fresh Water and Salt Water Service Reservoirs to Caverns

Baseline Environmental Monitoring Schedule (for Additional Air Quality Monitoring at DM-4 and Noise Monitoring at NM-4, NM-5 and NM-6) (Version 1.1)

May 2023

Sun	Mon	Tue	Wed	Thur	Fri	Sat
	1	2 Baseline Air Quality and Noise Monitoring (DM-4, NM-4, NM-5, NM-6)	3 Baseline Air Quality and Noise Monitoring (DM-4, NM-4, NM-5, NM-6)	4 Baseline Air Quality and Noise Monitoring (DM-4, NM-4, NM-5, NM-6)	5 Baseline Air Quality and Noise Monitoring (DM-4, NM-4, NM-5, NM-6)	6 Baseline Air Quality and Noise Monitoring (DM-4, NM-4, NM-5, NM-6)
7 Baseline Air Quality and Noise Monitoring (DM-4, NM-4, NM-5, NM-6)	8 Baseline Air Quality and Noise Monitoring (DM-4, NM-4, NM-5, NM-6)	9 Baseline Air Quality and Noise Monitoring (DM-4, NM-4, NM-5, NM-6)	10 Baseline Air Quality and Noise Monitoring (DM-4, NM-4, NM-5, NM-6)	11 Baseline Air Quality and Noise Monitoring (DM-4, NM-4, NM-5, NM-6)	12 Baseline Air Quality and Noise Monitoring (DM-4, NM-4, NM-5, NM-6)	13 Baseline Air Quality and Noise Monitoring (DM-4, NM-4, NM-5, NM-6)
14 (Cancelled due to inclement weather)	15 Baseline Air Quality and Noise Monitoring (DM-4, NM-4, NM-5, NM-6)	16 Baseline Air Quality and Noise Monitoring (DM-4, NM-4, NM-5, NM-6)	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Remark: Due to inclement weather on 14 May 2023, the baseline monitoring was cancelled and rescheduled to 16 May 2023.

Air Quality Monitoring Station:
DM-4 - Block 6, Tsui Chuk Garden

Noise Monitoring Stations:
NM-4 - Block 6, Tsui Chuk Garden
NM-5 - Wo Tin House, Shatin Pass Estate
NM-6 - Sheung Fung Street Customs Staff Quarter

Appendix C

Baseline 1-hour TSP Monitoring Results and Graphical Presentation

Appendix C - 1-hour TSP Monitoring Results

DM-1 - Tennis Court near Tin Ma Court			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
27 February 2023	11:00	Sunny	68
	12:00		74
	13:00		77
28 February 2023	9:42	Sunny	72
	10:42		80
	11:42		79
1 March 2023	9:35	Sunny	73
	10:35		76
	11:35		83
2 March 2023	9:29	Sunny	77
	10:29		79
	11:29		84
3 March 2023	9:57	Sunny	68
	10:57		75
	11:57		74
4 March 2023	9:52	Fine	72
	10:52		78
	11:52		83
5 March 2023	9:56	Sunny	70
	10:56		72
	11:56		77
6 March 2023	10:47	Sunny	83
	11:47		74
	12:47		85
7 March 2023	10:43	Sunny	84
	11:43		78
	12:43		74
8 March 2023	11:49	Sunny	84
	12:49		72
	13:49		88
9 March 2023	10:39	Sunny	83
	11:39		73
	12:39		85
10 March 2023	13:13	Sunny	76
	14:13		84
	15:13		88
11 March 2023	9:57	Sunny	68
	10:57		76
	11:57		80
12 March 2023	15:30	Cloudy	69
	16:30		72
	17:30		73
		Minimum	68
		Maximum	88
		Average	77

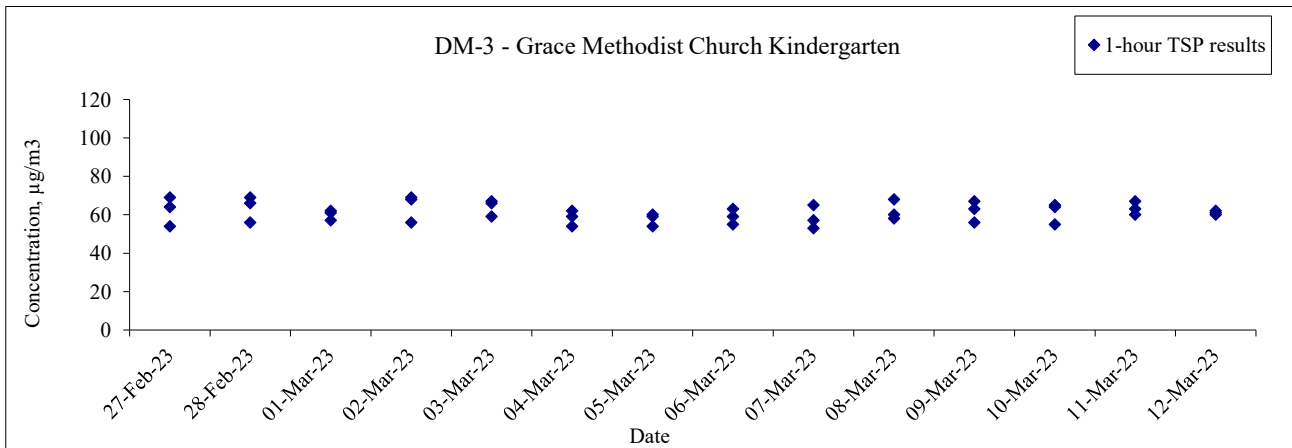
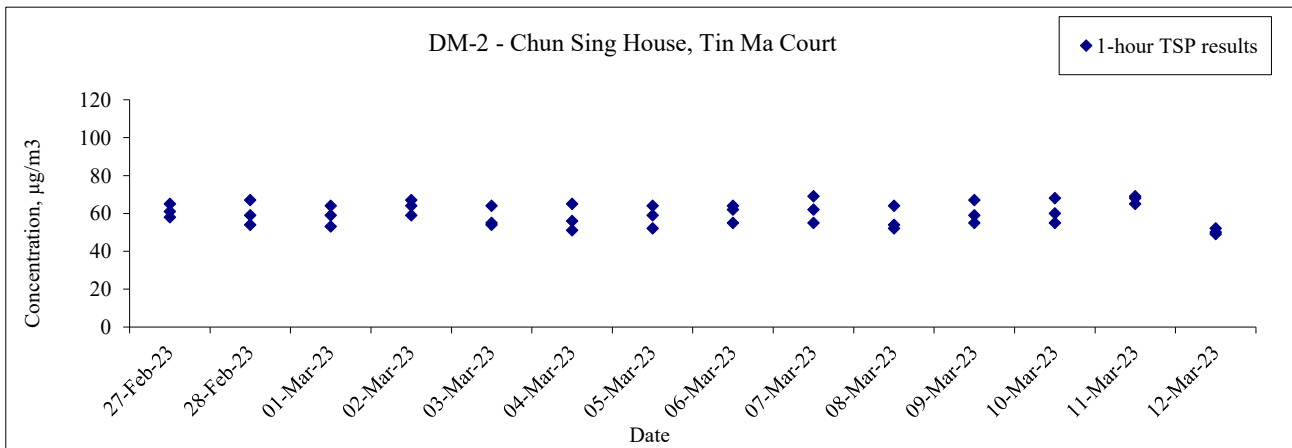
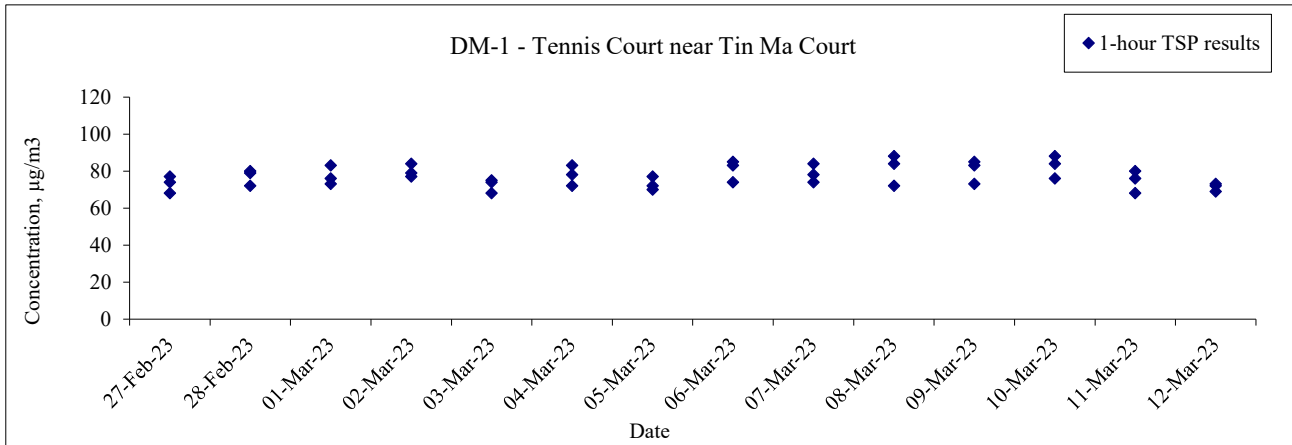
DM-2 - Chun Sing House, Tin Ma Court			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
27 February 2023	10:14	Sunny	58
	11:14		65
	12:14		61
28 February 2023	9:55	Sunny	54
	10:55		59
	11:55		67
1 March 2023	9:52	Sunny	53
	10:52		59
	11:52		64
2 March 2023	10:08	Sunny	59
	11:08		64
	12:08		67
3 March 2023	10:19	Sunny	54
	11:19		64
	12:19		55
4 March 2023	10:11	Fine	51
	11:11		56
	12:11		65
5 March 2023	10:17	Sunny	52
	11:17		64
	12:17		59
6 March 2023	9:59	Sunny	64
	10:59		55
	11:59		62
7 March 2023	9:54	Sunny	62
	10:54		69
	11:54		55
8 March 2023	9:55	Sunny	64
	10:55		54
	11:55		52
9 March 2023	9:51	Sunny	55
	10:51		67
	11:51		59
10 March 2023	9:57	Sunny	55
	10:57		68
	11:57		60
11 March 2023	10:12	Sunny	68
	11:12		65
	12:12		69
12 March 2023	15:09	Cloudy	50
	16:09		52
	17:09		49
		Minimum	49
		Maximum	69
		Average	60

DM-3 - Grace Methodist Church Kindergarten			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
27 February 2023	9:02	Sunny	64
	10:02		54
	11:02		69
28 February 2023	8:54	Sunny	56
	9:54		66
	10:54		69
1 March 2023	8:50	Sunny	57
	9:50		61
	10:50		62
2 March 2023	9:04	Sunny	56
	10:04		69
	11:04		68
3 March 2023	9:07	Sunny	67
	10:07		59
	11:07		66
4 March 2023	9:01	Fine	62
	10:01		54
	11:01		59
5 March 2023	9:10	Sunny	54
	10:10		60
	11:10		59
6 March 2023	9:08	Sunny	55
	10:08		59
	11:08		63
7 March 2023	9:10	Sunny	53
	10:10		57
	11:10		65
8 March 2023	9:09	Sunny	58
	10:09		60
	11:09		68
9 March 2023	9:05	Sunny	63
	10:05		67
	11:05		56
10 March 2023	9:09	Sunny	55
	10:09		65
	11:09		64
11 March 2023	9:15	Sunny	60
	10:15		67
	11:15		63
12 March 2023	10:06	Cloudy	61
	11:06		62
	12:06		60
	Minimum		53
	Maximum		69
	Average		61

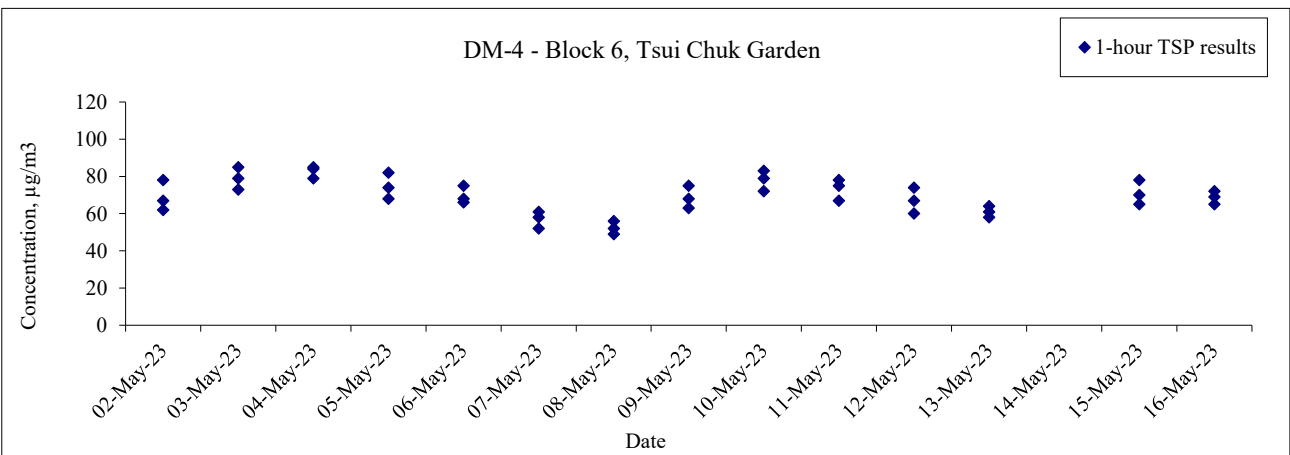
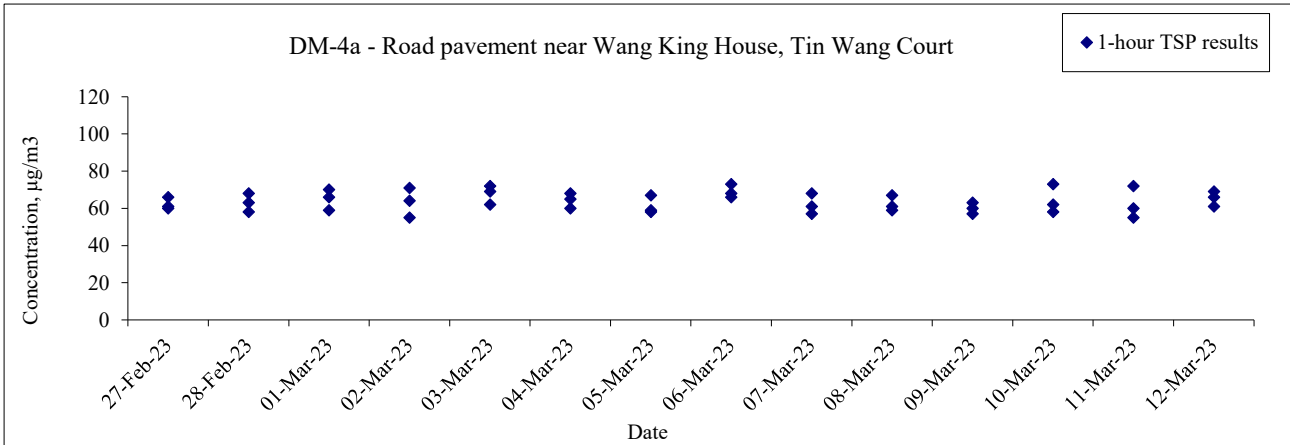
DM-4a - Road pavement near Wang King House, Tin Wang Court			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
27 February 2023	9:33	Sunny	60
	10:33		66
	11:33		61
28 February 2023	12:27	Sunny	63
	13:27		58
	14:27		68
1 March 2023	12:37	Sunny	70
	13:37		59
	14:37		66
2 March 2023	12:47	Sunny	64
	13:47		55
	14:47		71
3 March 2023	12:55	Sunny	62
	13:55		69
	14:55		72
4 March 2023	12:56	Fine	68
	13:56		65
	14:56		60
5 March 2023	12:49	Sunny	58
	13:49		67
	14:49		59
6 March 2023	12:17	Sunny	68
	13:17		66
	14:17		73
7 March 2023	12:15	Sunny	57
	13:15		61
	14:15		68
8 March 2023	12:26	Sunny	59
	13:26		61
	14:26		67
9 March 2023	12:17	Sunny	63
	13:17		57
	14:17		60
10 March 2023	13:28	Sunny	73
	14:28		62
	15:28		58
11 March 2023	13:01	Sunny	55
	14:01		60
	15:01		72
12 March 2023	14:05	Cloudy	69
	15:05		61
	16:05		66
		Minimum	55
		Maximum	73
		Average	64

DM-4 - Block 6, Tsui Chuk Garden			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
2 May 2023	11:14	Fine	67
	12:14		62
	13:14		78
3 May 2023	10:31	Fine	73
	11:31		85
	12:31		79
4 May 2023	10:44	Sunny	79
	11:44		84
	12:44		85
5 May 2023	12:40	Sunny	68
	13:40		74
	14:40		82
6 May 2023	11:01	Fine	75
	12:01		66
	13:01		68
7 May 2023	8:10	Cloudy	52
	9:10		61
	10:10		58
8 May 2023	12:25	Cloudy	49
	13:25		56
	14:25		52
9 May 2023	14:06	Fine	75
	15:06		68
	16:06		63
10 May 2023	12:33	Fine	79
	13:33		83
	14:33		72
11 May 2023	11:24	Fine	67
	12:24		75
	13:24		78
12 May 2023	9:23	Cloudy	60
	10:23		67
	11:23		74
13 May 2023	10:37	Cloudy	64
	11:37		58
	12:37		61
15 May 2023	11:02	Fine	65
	12:02		78
	13:02		70
16 May 2023	12:34	Fine	65
	13:34		72
	14:34		69
		Minimum	49
		Maximum	85
		Average	69

Baseline 1-hour TSP Concentration Level



Baseline 1-hour TSP Concentration Level



Appendix D

Baseline Noise Monitoring Results and Graphical Presentation

Appendix D - Baseline Noise Monitoring Results

Daytime Noise Level at Chun Sing House, Tin Ma Court (NM-2)

Date	Weather	Start Time	dB(A)			
			Leq	L10	L90	Leq(30min)
27 Feb 2023	Sunny	10:15	71.3	72.4	69.9	71.3
		10:20	70.8	72.3	69.3	
		10:25	71.4	72.8	70.0	
		10:30	71.8	73.2	70.6	
		10:35	71.0	73.0	69.4	
		10:40	71.5	74.1	70.2	
28 Feb 2023	Sunny	9:57	71.9	74.3	69.4	72.8
		10:02	72.7	75.5	70.2	
		10:07	71.6	74.2	69.3	
		10:12	73.3	75.3	70.0	
		10:17	73.1	76.0	70.4	
		10:22	73.9	75.9	71.1	
1 Mar 2023	Sunny	9:54	71.3	73.8	68.2	70.2
		9:59	69.0	71.8	67.7	
		10:04	71.4	73.5	68.5	
		10:09	70.6	72.7	68.1	
		10:14	68.7	71.4	67.5	
		10:19	69.1	72.7	68.4	
2 Mar 2023	Sunny	10:12	69.6	72.3	67.1	71.7
		10:17	71.3	73.4	68.8	
		10:22	71.9	74.5	68.1	
		10:27	73.4	75.6	69.4	
		10:32	72.3	75.0	69.2	
		10:37	70.4	73.6	67.7	
3 Mar 2023	Sunny	10:23	70.5	72.6	68.4	70.6
		10:28	72.1	74.1	69.5	
		10:33	69.8	73.4	67.7	
		10:38	69.5	72.8	67.1	
		10:43	69.9	72.4	67.6	
		10:48	71.2	74.3	68.0	
4 Mar 2023	Fine	10:16	69.1	71.5	67.8	69.9
		10:21	69.6	72.1	67.4	
		10:26	71.1	73.5	68.2	
		10:31	70.3	72.8	67.4	
		10:36	69.2	71.8	68.0	
		10:41	69.7	72.0	67.7	
5 Mar 2023	Sunny	10:20	68.6	71.2	66.5	68.8
		10:25	68.3	70.7	66.1	
		10:30	68.0	71.1	66.7	
		10:35	70.2	72	67.2	
		10:40	68.9	71.5	66.9	
		10:45	68.4	70.6	65.6	

Date	Weather	Start Time	dB(A)			
			Leq	L10	L90	Leq(30min)
6 Mar 2023	Sunny	10:05	71.1	73.4	68.5	70.5
		10:10	72.2	73.9	69.8	
		10:15	70.7	72.8	68.4	
		10:20	69.5	72.0	68.1	
		10:25	69.6	72.7	67.5	
		10:30	69.3	71.9	67.3	
7 Mar 2023	Sunny	10:01	70.2	72.0	67.9	70.5
		10:06	69.9	71.5	67.5	
		10:11	70.9	71.9	68.1	
		10:16	70.4	72.2	68.2	
		10:21	70.6	71.8	68.0	
8 Mar 2023	Sunny	10:03	70.6	72.8	68.5	71.5
		10:08	71.4	73.1	68.9	
		10:13	72.1	73.4	69.0	
		10:18	72.4	73.8	69.5	
		10:23	71.7	73.3	68.8	
		10:28	70.6	72.0	68.1	
9 Mar 2023	Sunny	9:53	71.2	72.8	68.9	71.4
		9:58	70.4	71.8	68.5	
		10:03	71.6	72.7	69.2	
		10:08	72.8	73.6	68.1	
		10:13	71.7	73.1	68.1	
		10:18	70.2	72.9	68.6	
10 Mar 2023	Sunny	10:02	70.0	71.6	67.6	69.7
		10:07	69.4	70.8	66.9	
		10:12	69.6	71.0	67.4	
		10:17	69.8	70.8	67.6	
		10:22	69.3	71.5	67.5	
		10:27	70.2	71.3	67.7	
11 Mar 2023	Sunny	10:16	69.6	71.0	66.9	70.8
		10:21	70.3	72.4	67.7	
		10:26	71.5	72.7	68.0	
		10:31	70.4	72.0	68.1	
		10:36	70.8	72.3	67.5	
		10:41	71.9	72.8	66.4	
12 Mar 2023	Cloudy	16:10	67.3	70.2	63.6	69.1
		16:15	68.4	72.4	64.9	
		16:20	68.9	73.6	64.3	
		16:25	70.2	72.4	66.2	
		16:30	69.2	73.1	64.5	
		16:35	70.1	73.6	63.6	
					Min:	68.8
					Max:	72.8
					Average:	70.6

Daytime Noise Level at Grace Methodist Church Kindergarten (NM-3)

Date	Weather	Start Time	dB(A)			
			Leq	L10	L90	Leq(30min)
27 Feb 2023	Sunny	9:07	65.4	68.9	57.9	66.2
		9:12	66.1	69.6	58.4	
		9:17	66.4	69.8	58.6	
		9:22	65.8	69.0	59.2	
		9:27	66.1	69.3	58.2	
		9:32	67.0	70.1	58.9	
28 Feb 2023	Sunny	9:01	66.4	68.5	56.6	66.8
		9:06	65.8	67.9	56.1	
		9:11	66.1	68.3	56.5	
		9:16	67.6	70.0	57.4	
		9:21	67.2	69.7	58.0	
		9:26	67.4	70.3	57.8	
1 Mar 2023	Sunny	8:54	65.8	68.5	56.2	66.8
		8:59	67.5	69.9	58.5	
		9:04	67.1	69.3	57.1	
		9:09	66.0	68.8	56.7	
		9:14	67.7	70.0	58.4	
		9:19	66.4	68.9	58.7	
2 Mar 2023	Sunny	9:10	65.9	68.6	56.1	65.9
		9:15	66.3	68.3	56.6	
		9:20	65.6	68.2	56.0	
		9:25	66.7	67.9	55.8	
		9:30	64.9	67.0	55.3	
		9:35	65.7	67.4	55.9	
3 Mar 2023	Sunny	9:15	65.9	68.0	56.9	64.9
		9:20	64.1	67.3	54.4	
		9:25	65.5	67.6	55.7	
		9:30	63.3	66.8	54.9	
		9:35	65.2	67.9	56.4	
		9:40	64.8	67.2	54.7	
4 Mar 2023	Fine	9:09	63.8	67.1	54.4	64.9
		9:14	65.5	67.8	55.7	
		9:19	64.0	66.9	54.8	
		9:24	65.2	67.4	55.5	
		9:29	64.7	67.6	55.8	
		9:34	65.8	68.1	56.2	
5 Mar 2023	Sunny	9:17	64.4	68.1	55.4	63.6
		9:22	63.1	66.9	54.0	
		9:27	63.8	66.4	53.8	
		9:32	62.3	65.9	54.2	
		9:37	64.1	66.8	54.9	
		9:42	63.5	67.5	53.3	

Date	Weather	Start Time	dB(A)			
			Leq	L10	L90	Leq(30min)
6 Mar 2023	Sunny	9:12	64.1	67.9	54.8	65.1
		9:17	65.4	68.7	55.5	
		9:22	64.8	68.4	53.5	
		9:27	65.5	68.6	54.6	
		9:32	64.7	68.2	55.2	
		9:37	65.9	67.7	54.7	
7 Mar 2023	Sunny	9:17	65.8	68.3	56.7	64.8
		9:22	64.1	67.7	55.1	
		9:27	65.8	68.0	55.3	
		9:32	64.0	67.2	54.9	
		9:37	64.7	67.5	55.0	
		9:42	64.2	66.9	54.6	
8 Mar 2023	Sunny	9:13	64.7	67.7	55.1	65.1
		9:18	65.8	69.5	56.4	
		9:23	65.0	68.3	55.9	
		9:28	64.9	68.1	55.5	
		9:33	65.6	68.6	56.0	
		9:38	64.3	67.8	55.4	
9 Mar 2023	Sunny	9:09	64.0	67.4	54.2	65.0
		9:14	65.2	68.1	55.0	
		9:19	64.8	67.9	55.8	
		9:24	65.2	68.7	55.9	
		9:29	65.7	68.9	56.5	
		9:34	65.2	68.2	56.1	
10 Mar 2023	Sunny	9:14	64.0	67.4	55.0	64.8
		9:19	64.9	68.4	55.6	
		9:24	64.5	68.1	54.7	
		9:29	64.2	67.3	54.9	
		9:34	65.1	68.7	55.7	
		9:39	65.8	69.4	55.4	
11 Mar 2023	Sunny	9:18	64.7	68.1	54.6	65.1
		9:23	65.9	68.4	55.1	
		9:28	64.2	67.5	54.3	
		9:33	66.0	68.9	55.6	
		9:38	65.5	68.3	55.2	
		9:43	64.1	67.6	54.7	
12 Mar 2023	Cloudy	10:23	63.6	68.1	58.1	64.0
		10:28	64.5	69.4	60.2	
		10:33	63.1	67.1	58.2	
		10:38	64.7	69.6	59.2	
		10:43	63.6	68.4	60.2	
		10:48	64.1	68.8	58.1	
					Min:	63.6
					Max:	66.8
					Average:	65.2

Daytime Noise Level at Road pavement near Wang King House, Tin Wang Court (NM-4a)

Date	Weather	Start Time	dB(A)				
			Leq	L10	L90	Leq(30min)	With Free-Field correction
27 Feb 2023	Sunny	9:33	68.5	70.0	57.8	70.0	73.0
		9:38	70.4	71.6	60.2		
		9:43	70.9	72.7	60.0		
		9:48	68.3	69.9	57.4		
		9:53	71.0	72.8	60.5		
		9:58	69.9	71.8	58.5		
28 Feb 2023	Sunny	12:28	69.4	71.7	57.0	69.0	72.0
		12:33	68.7	70.6	56.6		
		12:38	68.1	70.4	56.9		
		12:43	69.6	72.0	58.4		
		12:48	69.3	71.4	57.7		
		12:53	68.8	71.6	57.2		
1 Mar 2023	Sunny	12:40	69.1	71.6	59.0	68.8	71.8
		12:45	68.6	70.8	57.9		
		12:50	68.3	70.3	57.8		
		12:55	68.8	71.4	58.1		
		13:00	68.3	71.1	57.5		
		13:05	69.4	72.0	58.9		
2 Mar 2023	Sunny	12:49	68.8	72.1	56.2	68.5	71.5
		12:54	67.7	71.3	55.6		
		12:59	69.5	72.7	57.0		
		13:04	69.1	72.0	56.4		
		13:09	67.9	71.4	55.5		
		13:14	67.5	71.7	54.8		
3 Mar 2023	Sunny	12:58	68.5	72.4	55.7	69.8	72.8
		13:03	69.5	72.5	56.8		
		13:08	69.2	72.1	57.1		
		13:13	71.8	73.3	56.2		
		13:18	69.3	72.8	56.0		
		13:23	69.5	73.1	56.5		
4 Mar 2023	Fine	12:58	69.6	72.5	56.4	69.8	72.8
		13:03	70.7	73.2	57.1		
		13:08	68.5	72.1	55.9		
		13:13	69.1	72.5	55.7		
		13:18	70.6	73.7	56.1		
		13:23	69.9	73.6	55.3		
5 Mar 2023	Sunny	12:53	70.4	72.3	56.0	69.2	72.2
		12:58	69.6	71.8	55.6		
		13:03	68.5	72.5	55.1		
		13:08	68.3	71.9	54.7		
		13:13	69.3	72.8	54.1		
		13:18	69.0	72.1	54.5		

Date	Weather	Start Time	dB(A)				
			Leq	L10	L90	Leq(30min)	With Free-Field correction
6 Mar 2023	Sunny	12:20	69.7	72.2	57.5	70.5	73.5
		12:25	70.2	73.7	57.9		
		12:30	70.6	72.5	58.3		
		12:35	71.3	73.8	57.0		
		12:40	70.0	72.1	56.5		
		12:45	70.9	73.0	56.8		
7 Mar 2023	Sunny	12:21	71.8	73.0	56.8	70.7	73.7
		12:26	71.0	72.2	56.6		
		12:31	70.1	71.4	55.1		
		12:36	68.4	71.2	54.8		
		12:41	70.5	72.0	55.4		
		12:46	71.5	72.6	55.9		
8 Mar 2023	Sunny	12:27	70.6	71.0	56.6	69.9	72.9
		12:32	69.7	72.9	56.3		
		12:37	68.4	72.1	55.8		
		12:42	71.9	73.8	56.1		
		12:47	68.3	72.7	55.4		
		12:52	69.6	73.5	56.0		
9 Mar 2023	Sunny	12:21	69.3	72.5	56.4	69.4	72.4
		12:26	68.2	71.4	56.2		
		12:31	69.8	73.9	57.5		
		12:36	70.5	73.3	55.8		
		12:41	68.6	70.9	55.7		
		12:46	69.4	71.8	56.7		
10 Mar 2023	Sunny	13:31	68.1	72.0	55.2	70.4	73.4
		13:36	68.8	72.7	56.6		
		13:41	71.9	73.6	58.7		
		13:46	70.5	74.1	57.9		
		13:51	71.0	74.6	56.0		
		13:56	70.8	73.9	56.5		
11 Mar 2023	Sunny	13:03	70.7	72.5	56.2	70.0	73.0
		13:08	71.0	73.3	57.5		
		13:13	70.1	72.8	56.5		
		13:18	68.8	72.4	56.4		
		13:23	69.5	71.9	55.2		
		13:28	69.2	72.7	55.5		
12 Mar 2023	Cloudy	14:10	67.1	70.4	64.3	68.3	71.3
		14:15	68.1	71.6	63.1		
		14:20	68.4	71.9	63.9		
		14:25	68.0	71.4	63.4		
		14:30	68.9	72.6	64.1		
		14:35	69.0	73.1	63.6		
				Min:	68.3	71.3	
				Max:	70.7	73.7	
				Average:	69.6	72.6	

Daytime Noise Level at Block 6, Tsui Chuk Garden (NM-4)

Date	Weather	Start Time	dB(A)			
			Leq	L10	L90	Leq(30min)
2 May 2023	Fine	11:15	65.1	66.2	63.9	65.3
		11:20	65.7	66.7	64.3	
		11:25	65.4	66.6	64.0	
		11:30	65.3	66.4	64.3	
		11:35	65.0	66.1	63.6	
		11:40	65.4	67.1	63.1	
3 May 2023	Fine	10:35	64.4	66.0	63.1	65.0
		10:40	65.2	66.8	63.4	
		10:45	64.7	65.9	63.5	
		10:50	65.0	66.4	63.5	
		10:55	64.9	66.8	62.9	
		11:00	65.5	67.0	63.6	
4 May 2023	Sunny	10:47	64.6	66.2	63.5	64.8
		10:52	64.6	66.8	63.9	
		10:57	64.1	65.2	63.3	
		11:02	64.9	65.8	63.4	
		11:07	65.1	66.4	64.2	
		11:12	65.3	66.1	63.9	
5 May 2023	Sunny	12:44	65.7	66.6	63.0	64.8
		12:49	65.1	66.5	63.4	
		12:54	64.6	65.8	63.2	
		12:59	64.2	65.3	63.0	
		13:04	65.0	67.2	62.7	
		13:09	63.8	65.1	62.6	
6 May 2023	Fine	11:05	65.1	66.6	64.0	64.9
		11:10	65.4	67.0	63.9	
		11:15	64.7	65.9	63.7	
		11:20	64.6	65.5	62.8	
		11:25	64.9	66.1	63.3	
		11:30	64.5	65.8	62.7	
7 May 2023	Cloudy	8:14	60.2	61.6	58.6	60.6
		8:19	60.9	62.4	59.0	
		8:24	60.5	62.2	59.1	
		8:29	60.2	62.5	58.4	
		8:34	61.1	63.0	59.5	
		8:39	60.8	62.5	58.7	
8 May 2023	Cloudy	12:27	64.0	66.6	63.1	64.7
		12:32	65.3	65.9	62.5	
		12:37	65.1	66.4	63.7	
		12:42	65.4	66.1	63.6	
		12:47	64.0	66.0	63.0	
		12:52	64.4	66.2	62.7	

Date	Weather	Start Time	dB(A)			
			Leq	L10	L90	Leq(30min)
9 May 2023	Fine	14:10	64.4	65.7	62.9	64.6
		14:15	65.0	66.1	63.1	
		14:20	64.1	65.9	62.8	
		14:25	65.0	66.4	63.5	
		14:30	64.8	65.6	63.3	
		14:35	63.9	65.2	63.0	
10 May 2023	Fine	12:39	64.9	65.8	63.0	65.5
		12:44	65.2	66.7	63.3	
		12:49	66.6	66.9	64.4	
		12:54	66.0	66.5	64.0	
		12:59	64.8	65.9	63.5	
		13:04	65.0	65.8	63.2	
11 May 2023	Fine	11:29	64.8	66.0	63.4	64.8
		11:34	64.7	66.1	64.0	
		11:39	65.1	66.5	63.7	
		11:44	64.7	65.8	63.8	
		11:49	64.9	65.7	63.5	
		11:54	64.4	65.2	63.1	
12 May 2023	Cloudy	9:26	64.0	66.7	63.6	64.6
		9:31	64.7	65.3	63.1	
		9:36	64.5	66.1	63.4	
		9:41	65.4	66.6	62.9	
		9:46	64.0	65.8	62.7	
		9:51	65.1	65.4	63.0	
13 May 2023	Cloudy	10:39	65.4	66.7	64.1	64.8
		10:44	64.8	66.2	63.3	
		10:49	64.1	65.9	63.4	
		10:54	64.7	66.0	62.9	
		10:59	65.7	66.4	63.8	
		11:04	64.1	65.8	63.5	
15 May 2023	Fine	11:06	64.6	65.9	63.3	65.4
		11:11	65.1	65.8	64.3	
		11:16	65.1	65.9	64.1	
		11:21	65.5	66.1	64.7	
		11:26	66.5	67.8	64.8	
		11:31	65.1	66.2	63.8	
16 May 2023	Fine	12:38	64.2	65.2	63.0	64.4
		12:43	64.4	65.5	63.2	
		12:48	64.3	65.4	62.9	
		12:53	64.3	65.6	62.8	
		12:58	64.6	65.7	63.3	
		13:03	64.4	65.6	63.2	
					Min:	60.6
					Max:	65.5
					Average:	64.6

Daytime Noise Level at Wo Tin House, Shatin Pass Estate (NM-5)

Date	Weather	Start Time	dB(A)			
			Leq	L10	L90	Leq(30min)
2 May 2023	Fine	9:14	65.3	68.8	56.2	64.4
		9:19	63.9	67.6	55.9	
		9:24	64.5	68.1	54.1	
		9:29	62.5	67.9	56.4	
		9:34	65.3	69.0	54.9	
		9:39	64.1	68.3	56.7	
3 May 2023	Fine	8:48	68.1	70.0	55.1	67.6
		8:53	69.2	71.1	55.5	
		8:58	67.1	70.8	53.8	
		9:03	66.5	69.9	52.4	
		9:08	65.8	68.2	53.3	
		9:13	67.9	71.4	53.6	
4 May 2023	Sunny	9:03	68.4	70.5	56.7	65.5
		9:08	63.2	68.4	53.9	
		9:13	64.1	67.7	52.8	
		9:18	64.9	68.1	55.2	
		9:23	64.5	67.6	54.1	
		9:28	65.6	68.3	54.9	
5 May 2023	Sunny	14:08	63.9	67.3	56.8	64.9
		14:13	63.3	66.9	56.0	
		14:18	67.1	70.8	57.4	
		14:23	65.4	68.5	56.1	
		14:28	65.1	68.8	55.9	
		14:33	63.0	66.4	55.4	
6 May 2023	Fine	9:11	65.3	67.1	58.5	64.7
		9:16	64.1	68.8	57.1	
		9:21	63.8	68.9	56.7	
		9:26	65.6	67.7	56.4	
		9:31	65.2	67.4	54.2	
		9:36	63.6	66.9	53.0	
7 May 2023	Cloudy	9:08	62.3	65.8	52.8	63.9
		9:13	64.9	66.2	53.6	
		9:18	64.4	66.1	54.7	
		9:23	63.7	65.5	52.6	
		9:28	65.0	68.4	53.9	
		9:33	62.5	66.0	52.5	
8 May 2023	Cloudy	9:22	67.5	70.4	54.6	65.3
		9:27	64.5	67.0	53.8	
		9:32	66.2	68.5	54.7	
		9:37	63.4	67.9	54.4	
		9:42	63.1	66.8	52.3	
		9:47	65.2	67.9	54.9	

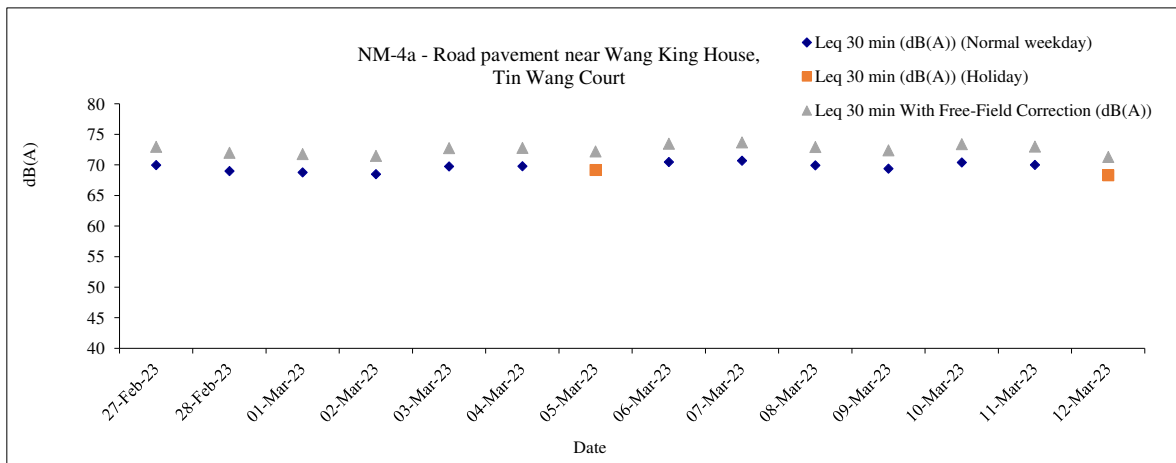
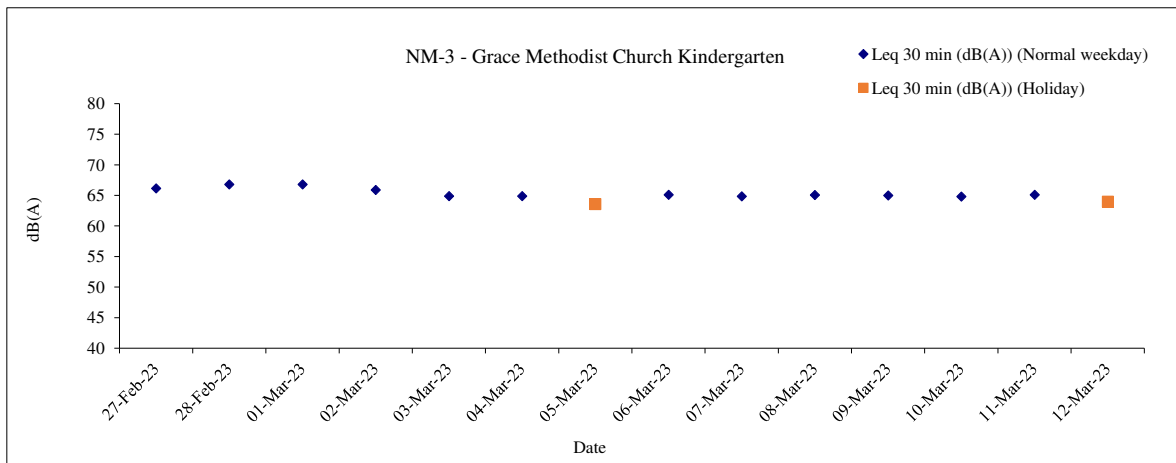
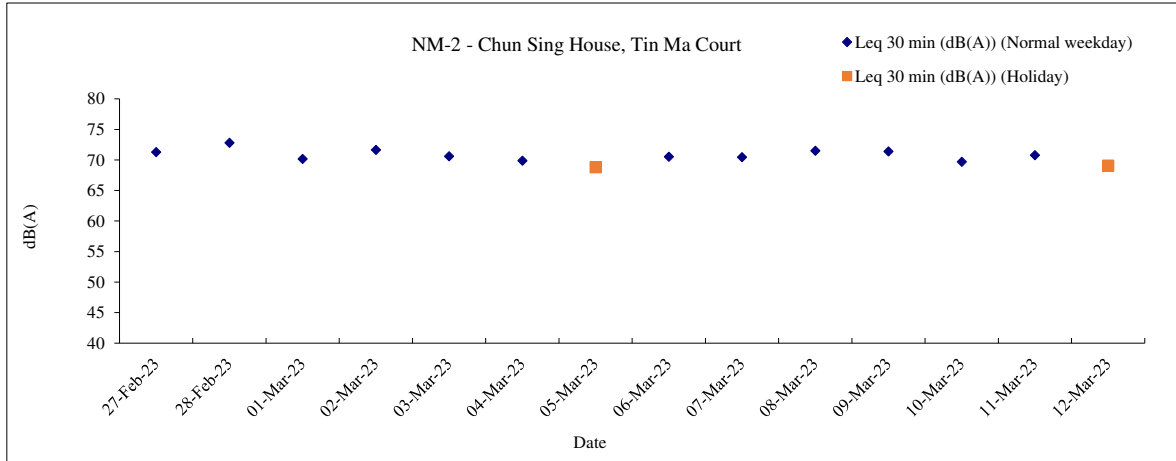
Date	Weather	Start Time	dB(A)			
			Leq	L10	L90	Leq(30min)
9 May 2023	Fine	15:19	65.8	68.4	54.0	65.6
		15:24	66.9	70.1	55.1	
		15:29	64.2	68.9	55.6	
		15:34	66.0	68.5	54.2	
		15:39	65.9	69.0	53.7	
		15:44	63.9	67.9	54.1	
10 May 2023	Fine	14:01	66.0	69.1	54.7	65.2
		14:06	63.9	68.5	54.8	
		14:11	64.4	68.9	53.5	
		14:16	63.9	67.5	54.6	
		14:21	65.4	68.0	55.1	
		14:26	66.7	70.3	55.5	
11 May 2023	Fine	9:05	65.3	68.0	56.6	65.6
		9:10	65.2	69.1	57.9	
		9:15	65.0	67.7	55.7	
		9:20	64.3	68.3	56.1	
		9:25	67.2	70.6	56.4	
		9:30	66.1	69.2	55.3	
12 May 2023	Cloudy	10:28	69.8	70.7	56.2	66.4
		10:33	65.3	68.1	54.9	
		10:38	64.7	67.5	55.2	
		10:43	64.3	67.2	54.4	
		10:48	66.4	68.7	56.1	
		10:53	64.9	67.5	56.0	
13 May 2023	Cloudy	8:54	66.6	68.2	52.3	65.6
		8:59	64.5	69.4	53.9	
		9:04	65.7	68.4	54.8	
		9:09	64.9	67.0	54.3	
		9:14	65.3	67.5	53.6	
		9:19	66.0	67.8	54.0	
15 May 2023	Fine	9:27	65.3	68.3	56.3	65.0
		9:32	64.9	67.6	56.3	
		9:37	62.5	65.3	55.9	
		9:42	64.9	67.2	55.9	
		9:47	66.1	69.3	56.7	
		9:52	65.6	68.8	54.8	
16 May 2023	Fine	13:42	65.1	69.2	53.4	64.8
		13:47	63.9	68.6	52.3	
		13:52	64.0	67.4	51.5	
		13:57	62.7	66.8	51.8	
		14:02	66.3	69.5	54.8	
		14:07	65.9	68.0	56.8	
					Min:	63.9
					Max:	67.6
					Average:	65.3

Daytime Noise Level at Sheung Fung Street Customs Staff Quarter (NM-6)

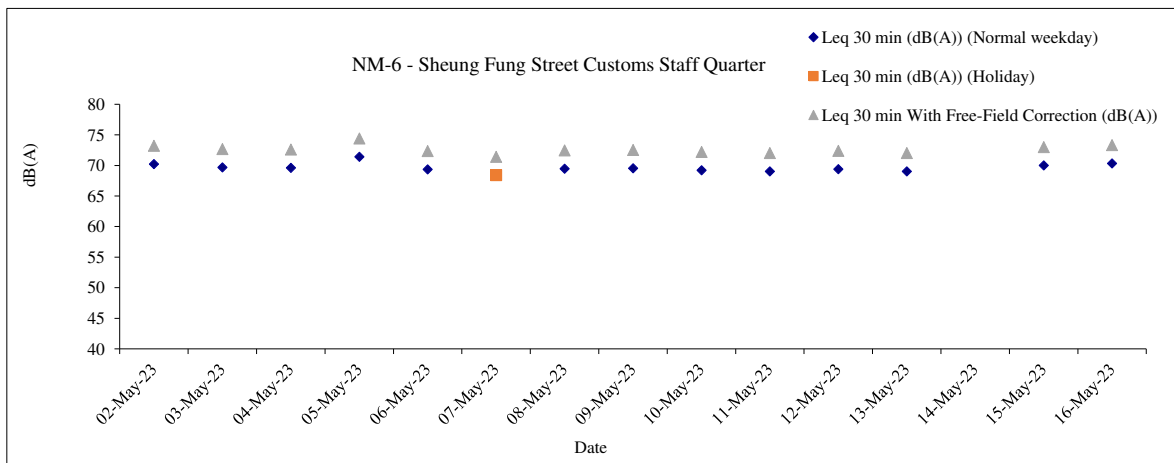
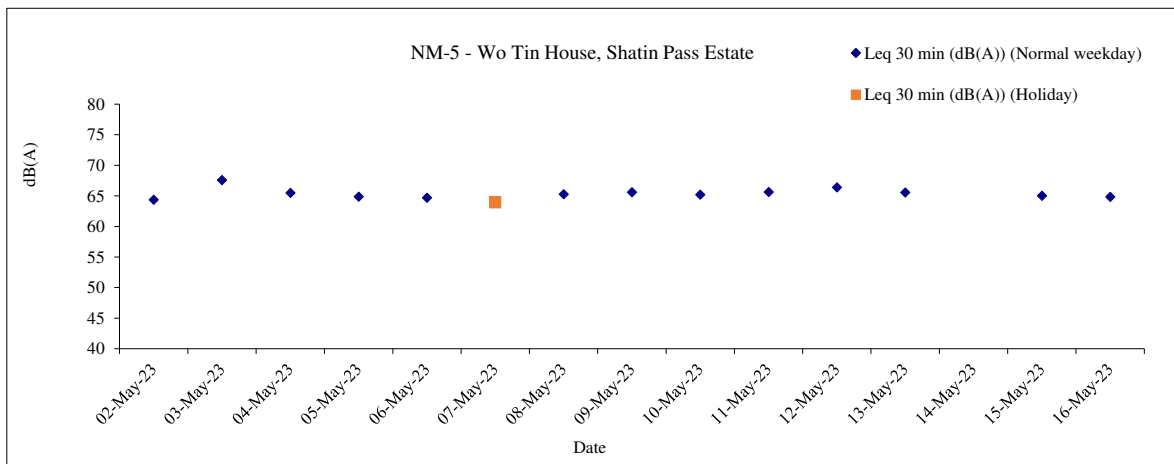
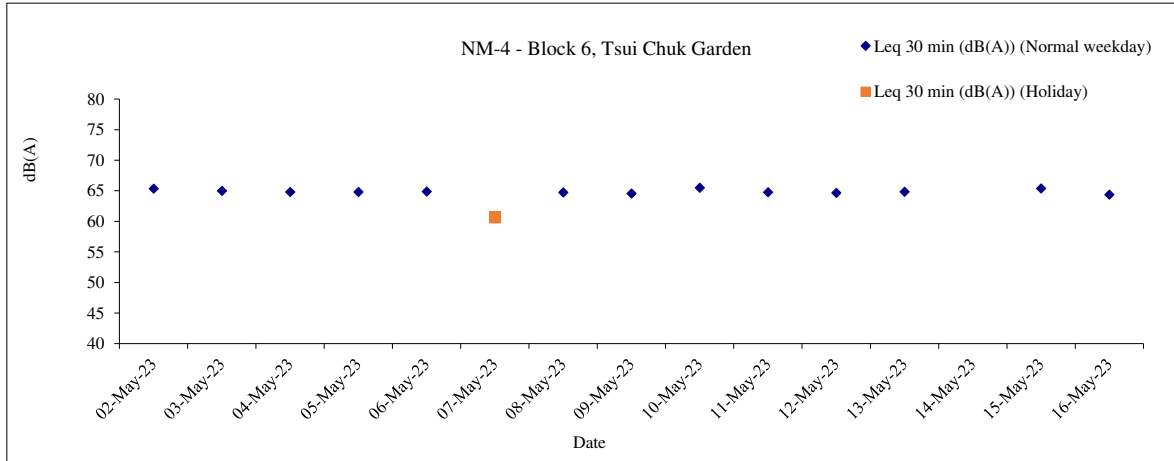
Date	Weather	Start Time	dB(A)				
			Leq	L10	L90	Leq(30min)	With Free-Field correction
2 May 2023	Fine	10:02	69.2	72.3	56.4	70.2	73.2
		10:07	70.2	73.5	56.1		
		10:12	69.5	73.1	57.0		
		10:17	72.5	75.9	57.7		
		10:22	70.7	74.9	57.5		
		10:27	67.3	71.2	55.9		
3 May 2023	Fine	9:30	70.1	73.3	66.4	69.6	72.6
		9:35	69.8	72.3	66.2		
		9:40	71.1	74.5	64.9		
		9:45	68.4	72.0	56.4		
		9:50	69.0	72.6	55.8		
		9:55	68.9	72.1	55.6		
4 May 2023	Sunny	9:45	66.0	71.4	56.3	69.6	72.6
		9:50	70.8	73.5	55.5		
		9:55	70.2	72.9	57.0		
		10:00	71.7	73.1	56.2		
		10:05	68.8	72.0	56.9		
		10:10	67.6	70.3	55.2		
5 May 2023	Sunny	14:50	71.6	73.8	55.1	71.4	74.4
		14:55	74.0	76.2	56.9		
		15:00	69.4	72.8	55.4		
		15:05	70.5	73.3	54.9		
		15:10	69.0	72.1	55.2		
		15:15	71.8	74.2	57.0		
6 May 2023	Fine	9:58	67.5	71.4	56.5	69.3	72.3
		10:03	66.1	70.9	55.6		
		10:08	71.4	73.7	55.9		
		10:13	69.8	72.6	58.1		
		10:18	70.2	74.5	59.0		
		10:23	69.1	72.9	57.9		
7 May 2023	Cloudy	9:59	67.7	70.7	53.0	68.4	71.4
		10:04	68.2	71.4	54.2		
		10:09	70.6	73.5	55.5		
		10:14	66.9	70.2	53.6		
		10:19	68.4	72.7	54.0		
		10:24	67.5	71.9	55.7		
8 May 2023	Cloudy	14:38	69.0	70.9	56.4	69.4	72.4
		14:43	68.8	72.6	57.1		
		14:48	71.3	73.8	57.2		
		14:53	70.6	73.0	56.9		
		14:58	67.5	71.6	57.5		
		15:03	68.2	70.5	58.1		

Date	Weather	Start Time	dB(A)				With Free-Field correction
			Leq	L10	L90	Leq(30min)	
9 May 2023	Fine	16:01	71.9	73.8	58.5	69.5	72.5
		16:06	67.0	72.4	59.1		
		16:11	67.8	70.7	56.4		
		16:16	69.5	71.8	57.2		
		16:21	69.1	72.3	55.0		
		16:26	70.1	73.0	55.8		
10 May 2023	Fine	14:48	67.3	70.7	56.0	69.2	72.2
		14:53	70.4	73.8	56.2		
		14:58	69.7	73.3	57.1		
		15:03	69.5	74.1	55.9		
		15:08	68.6	71.3	56.0		
		15:13	69.1	70.8	55.5		
11 May 2023	Fine	9:56	69.6	72.8	57.3	69.0	72.0
		10:01	70.6	75.0	59.4		
		10:06	69.3	73.1	58.6		
		10:11	66.9	70.4	56.5		
		10:16	69.0	74.6	57.0		
		10:21	67.7	72.1	55.4		
12 May 2023	Cloudy	11:21	67.4	71.1	56.0	69.4	72.4
		11:26	70.8	71.7	57.3		
		11:31	70.8	72.4	57.0		
		11:36	69.5	72.0	57.8		
		11:41	67.7	71.5	56.4		
		11:46	68.9	70.4	56.9		
13 May 2023	Cloudy	9:41	68.2	70.9	59.5	69.0	72.0
		9:46	67.1	71.4	60.1		
		9:51	70.1	70.9	58.4		
		9:56	70.5	71.2	60.3		
		10:01	69.3	70.8	59.9		
		10:06	67.8	70.2	59.3		
15 May 2023	Fine	10:06	70.6	73.8	58.9	70.0	73.0
		10:11	69.2	72.2	57.7		
		10:16	69.6	72.8	58.4		
		10:21	69.4	73.5	59.6		
		10:26	71.9	74.3	61.0		
		10:31	68.1	72.1	58.9		
16 May 2023	Fine	14:25	67.5	71.7	54.6	70.3	73.3
		14:30	68.2	71.9	55.2		
		14:35	72.5	75.6	57.5		
		14:40	69.0	73.0	57.4		
		14:45	72.5	75.6	56.8		
		14:50	69.3	72.3	57.5		
				Min:	68.4	71.4	
				Max:	71.4	74.4	
				Average:	69.6	72.6	

Baseline Noise Monitoring Results



Baseline Noise Monitoring Results

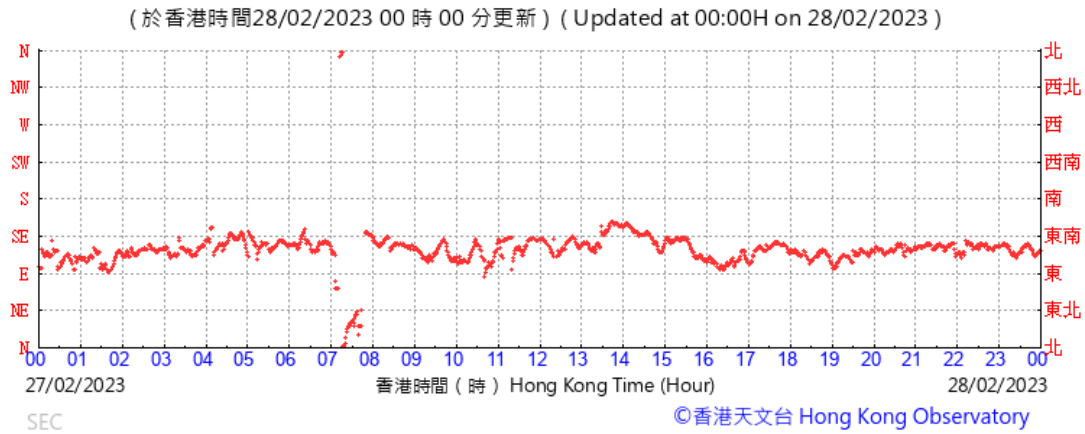


Appendix E

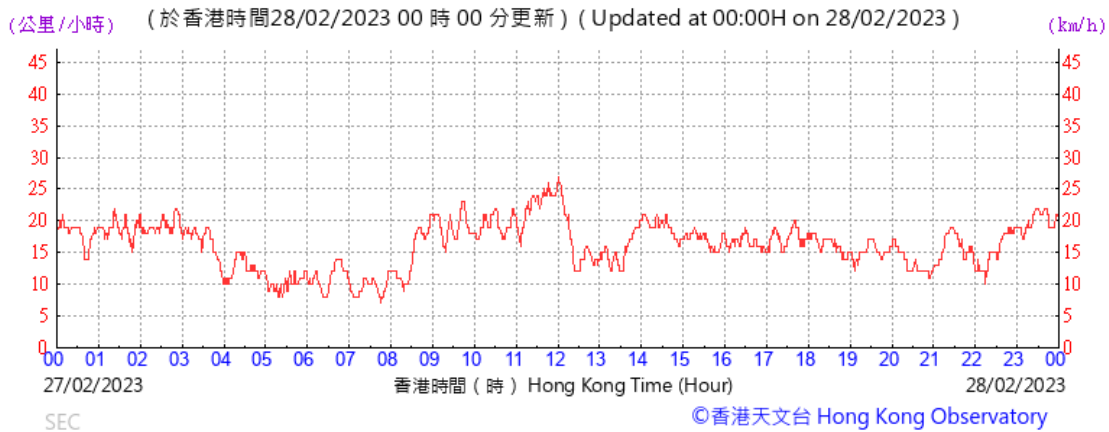
Extract of Meteorological Observations for Hong Kong (Kai Tak Wind Station)

Appendix E - Extract of Meteorological Observations for Hong Kong (Kai Tak Wind Station)

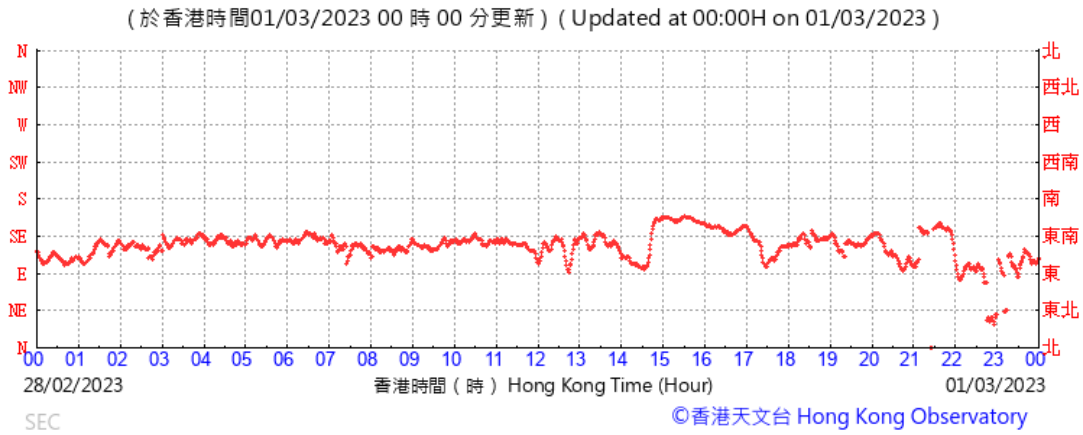
Wind Direction



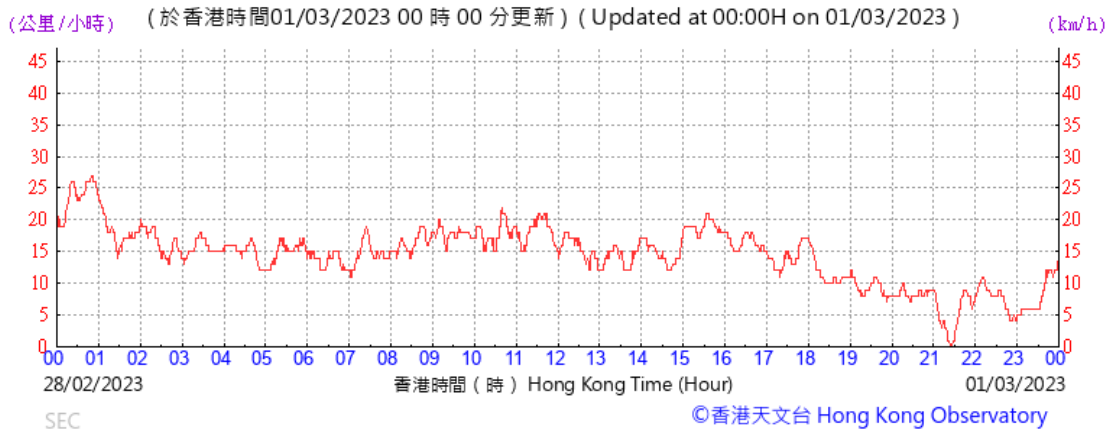
Wind Speed



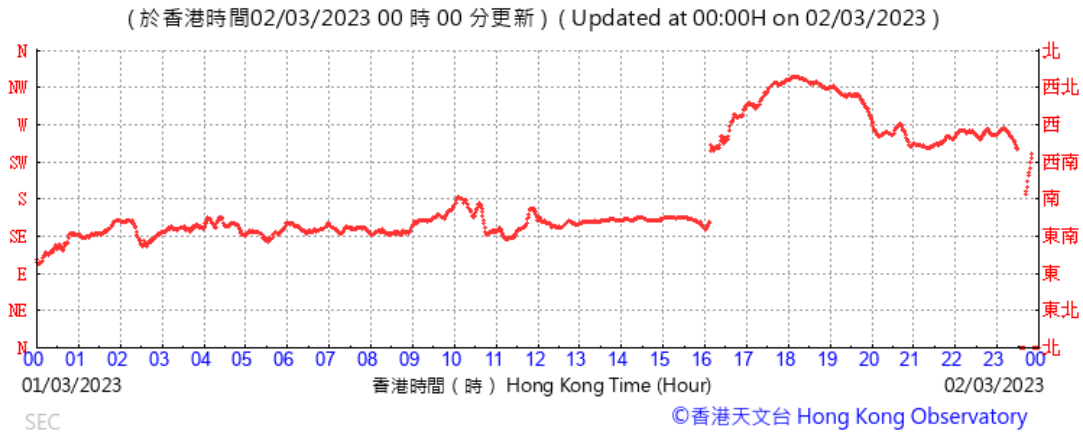
Wind Direction



Wind Speed



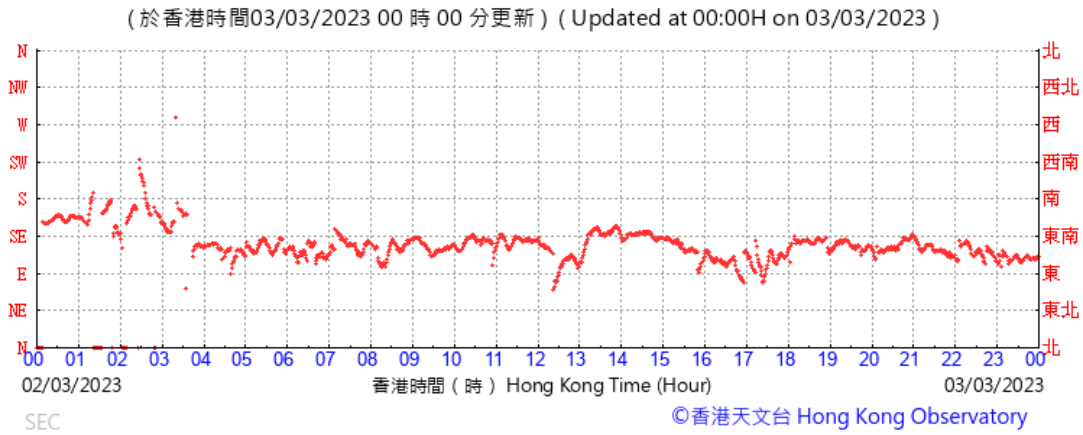
Wind Direction



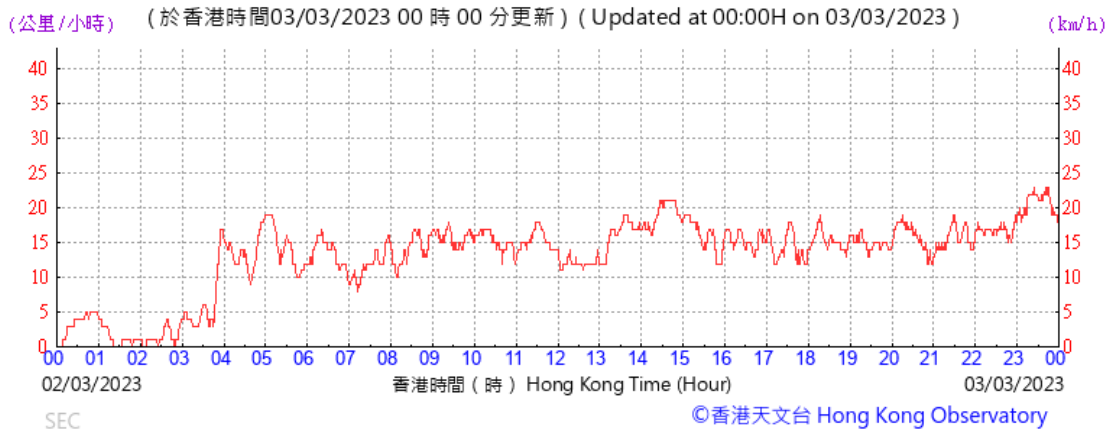
Wind Speed



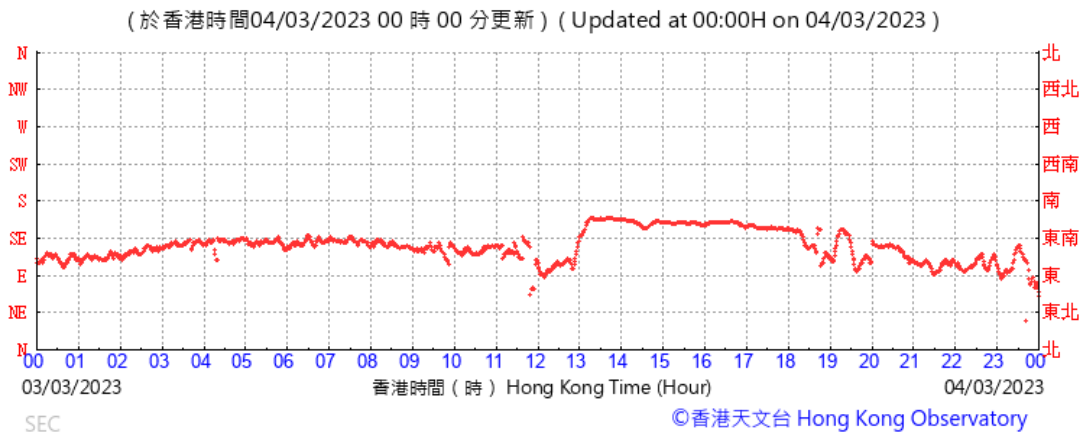
Wind Direction



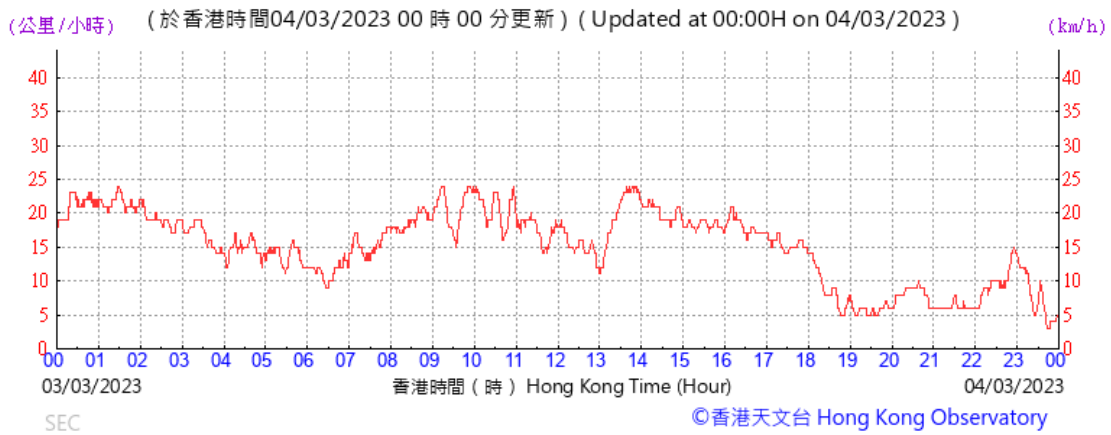
Wind Speed



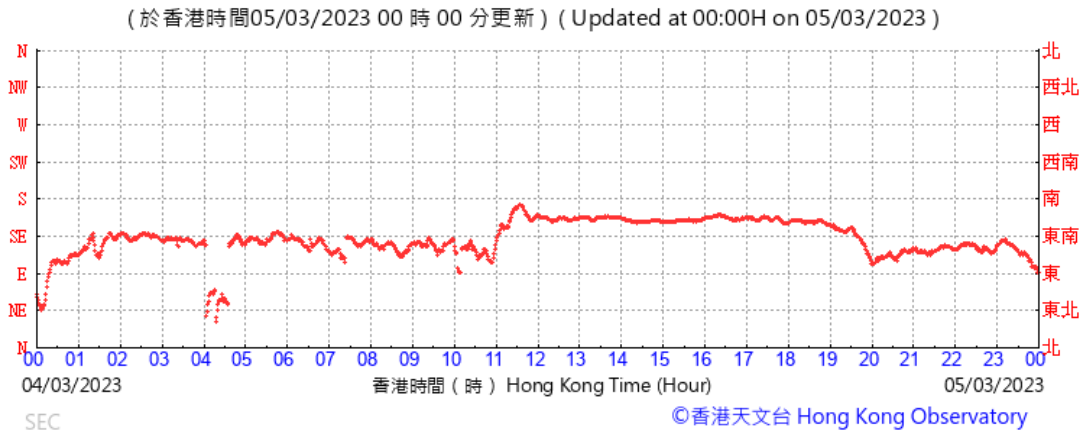
Wind Direction



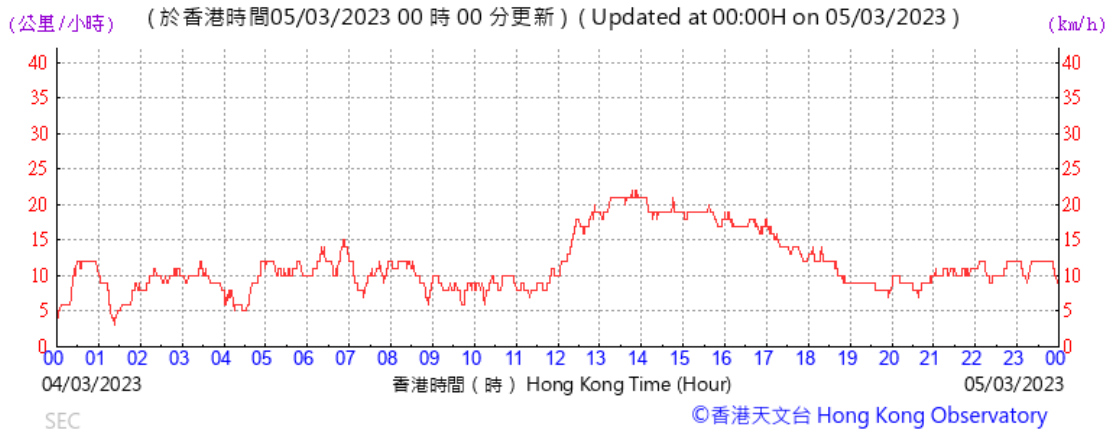
Wind Speed



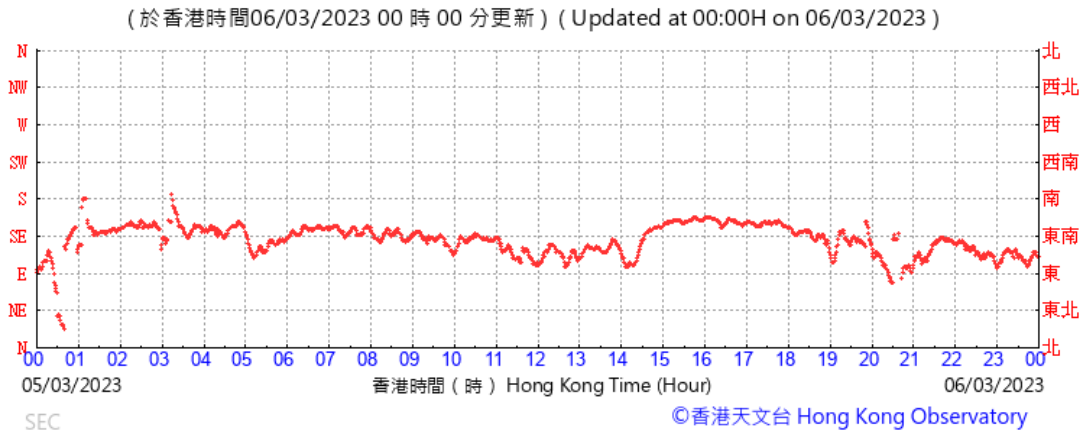
Wind Direction



Wind Speed



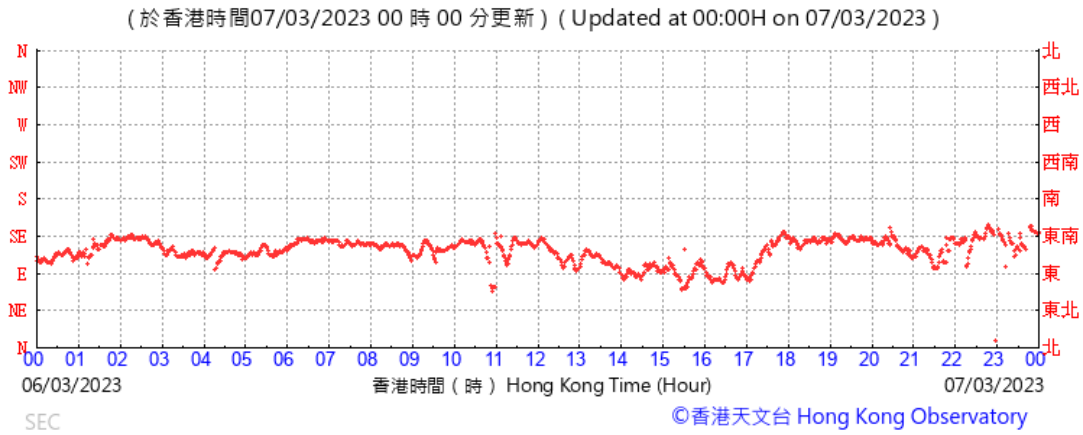
Wind Direction



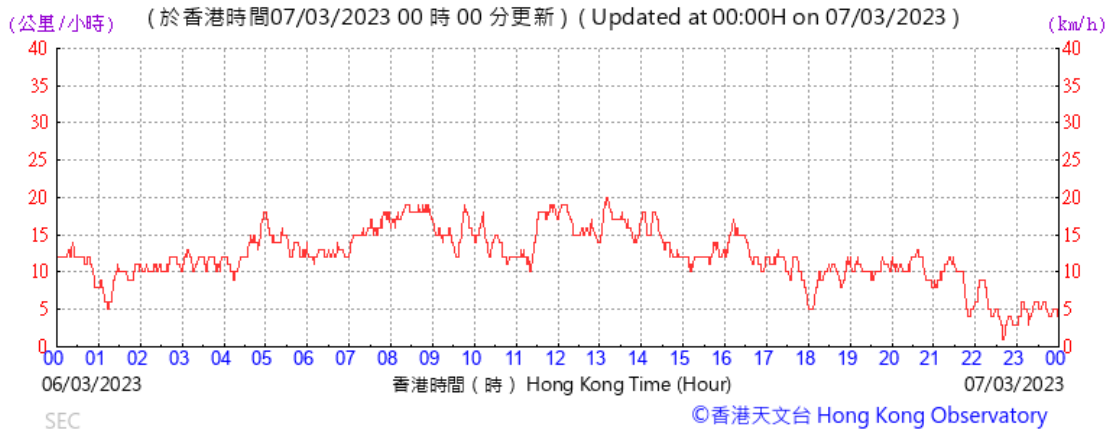
Wind Speed



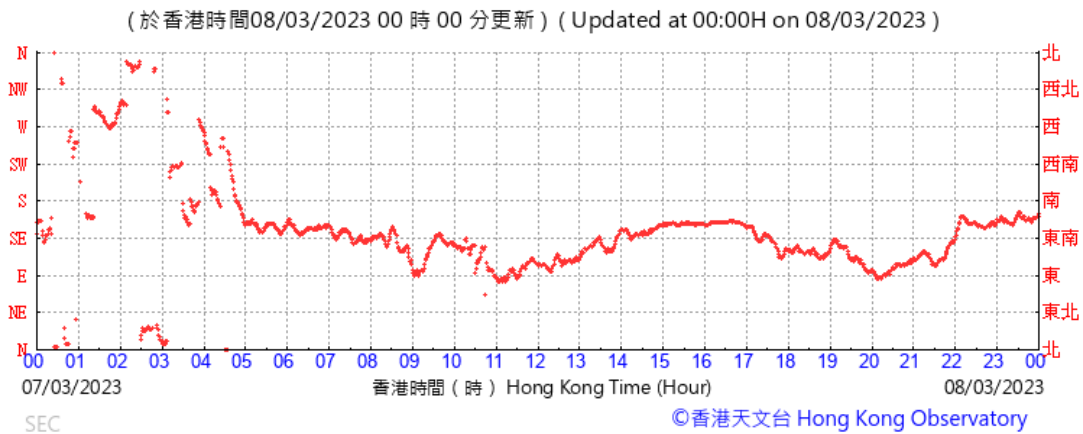
Wind Direction



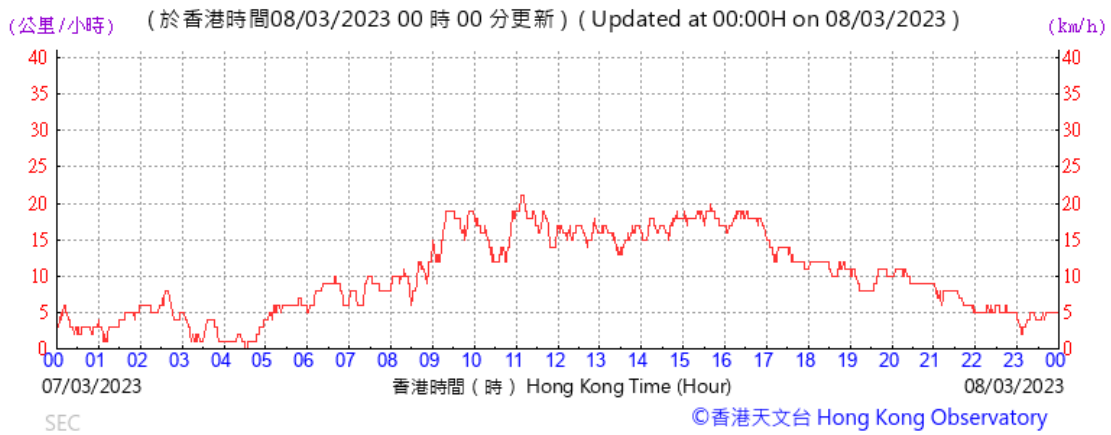
Wind Speed



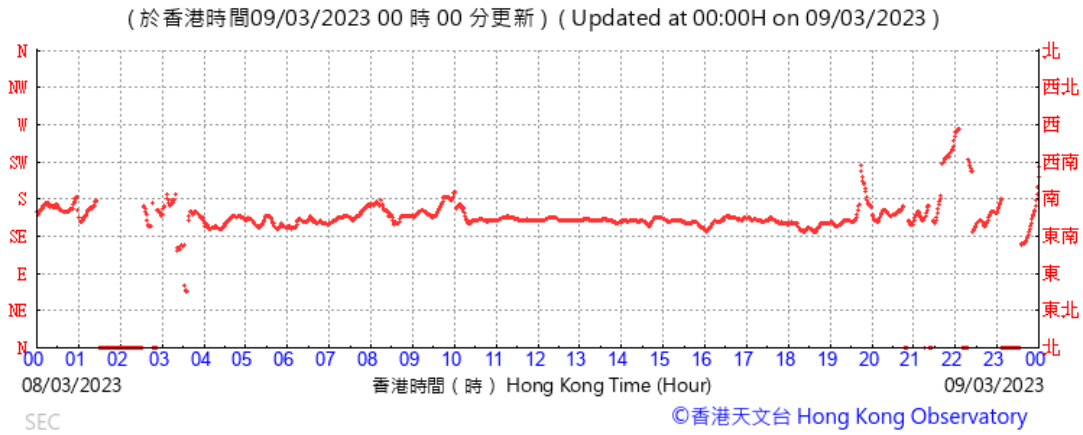
Wind Direction



Wind Speed



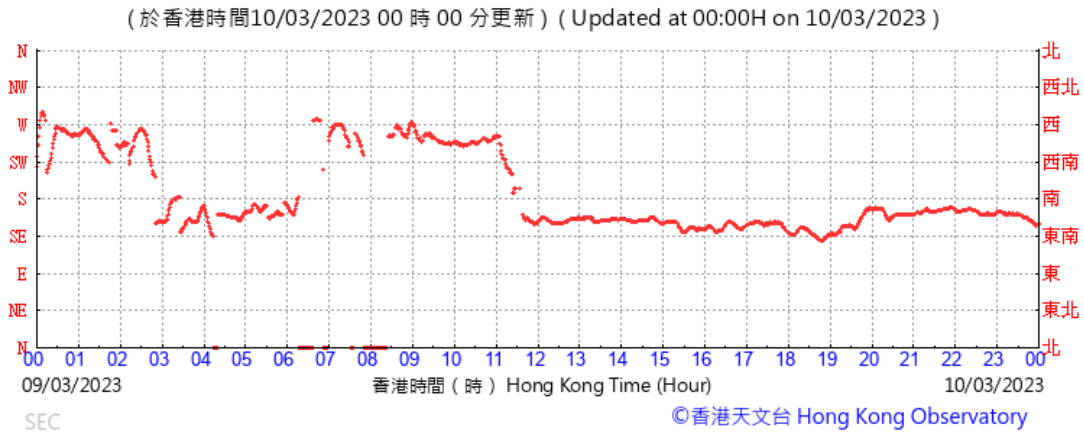
Wind Direction



Wind Speed



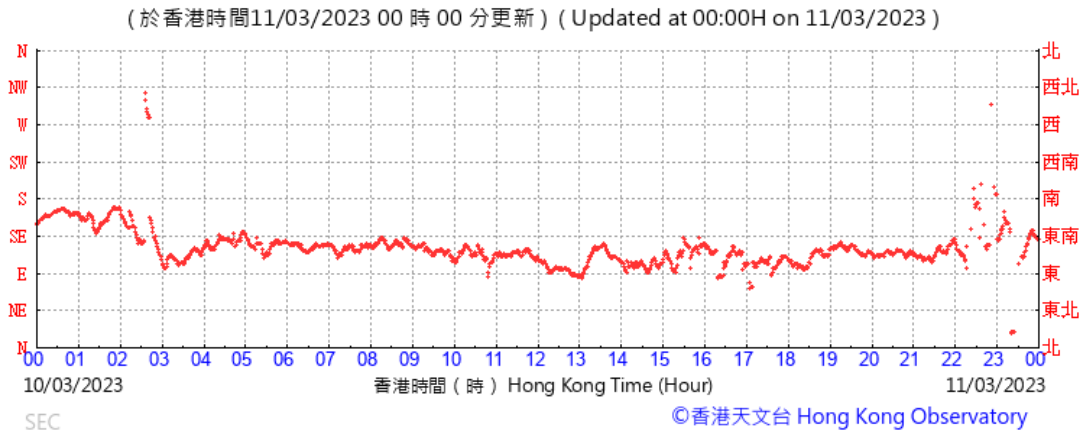
Wind Direction



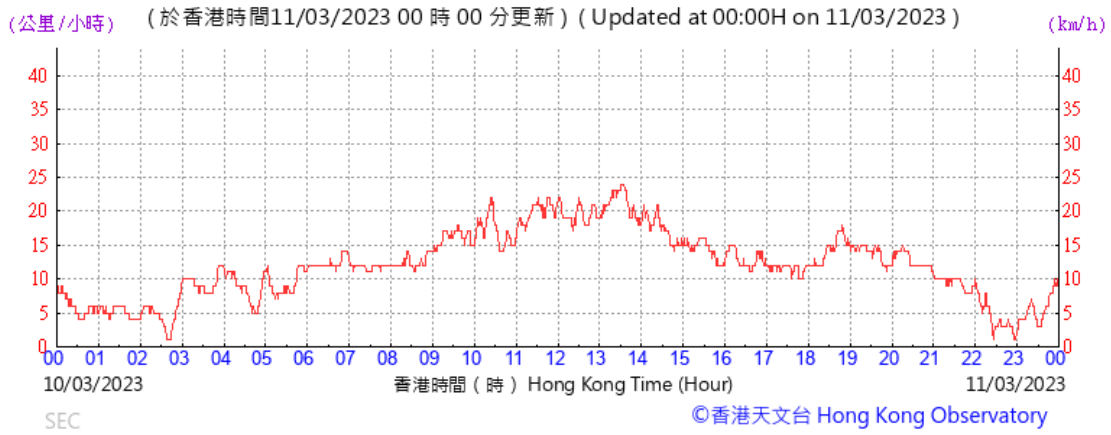
Wind Speed



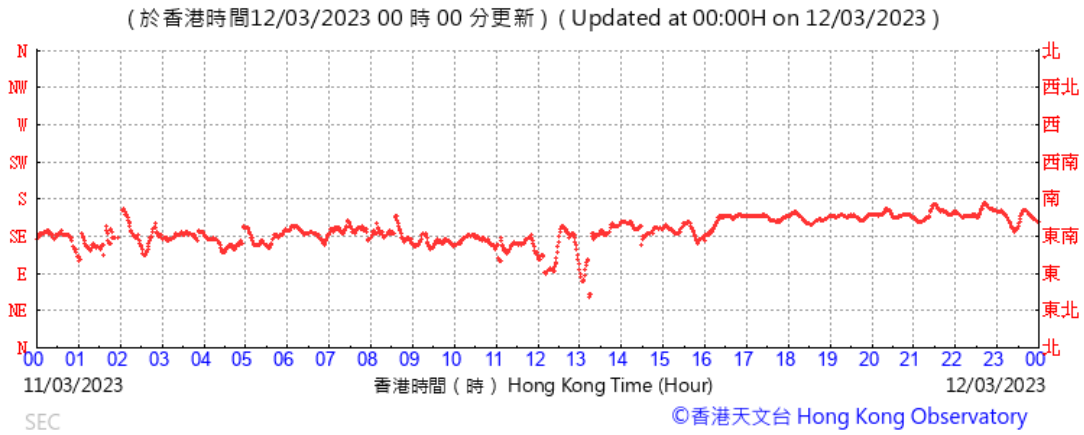
Wind Direction



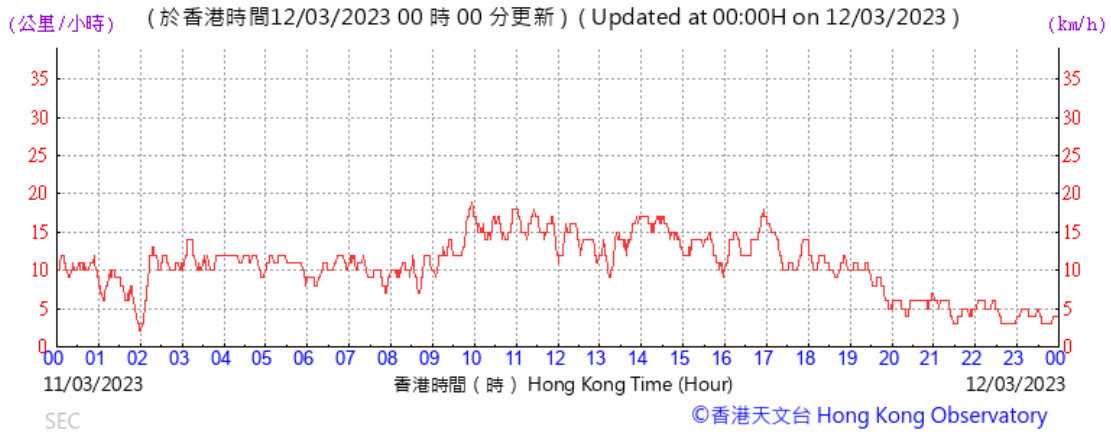
Wind Speed



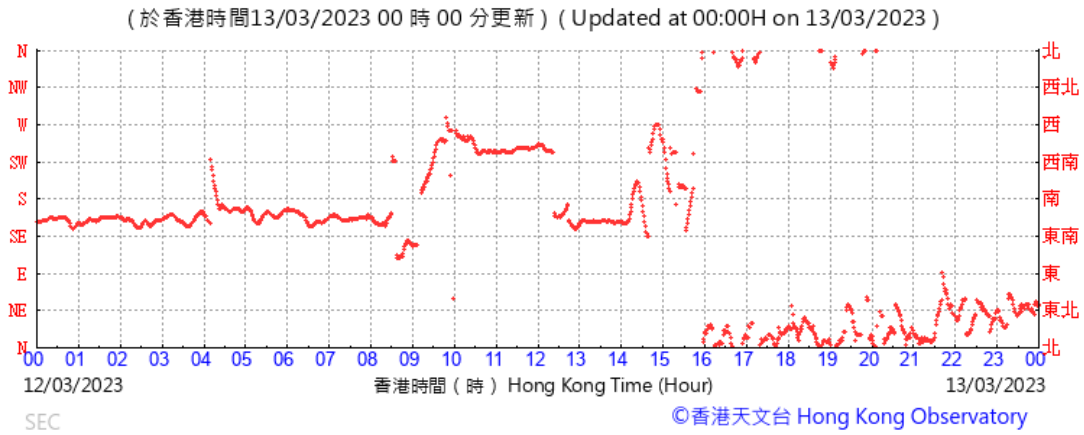
Wind Direction



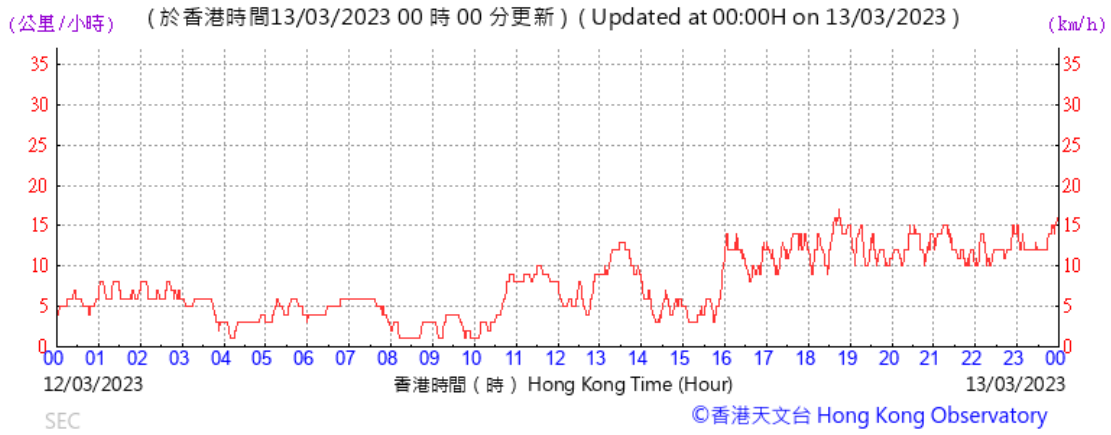
Wind Speed



Wind Direction

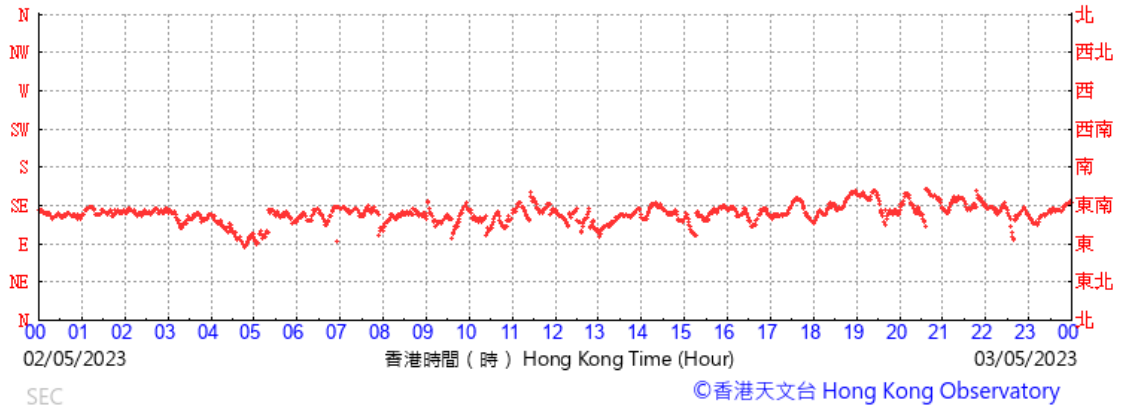


Wind Speed



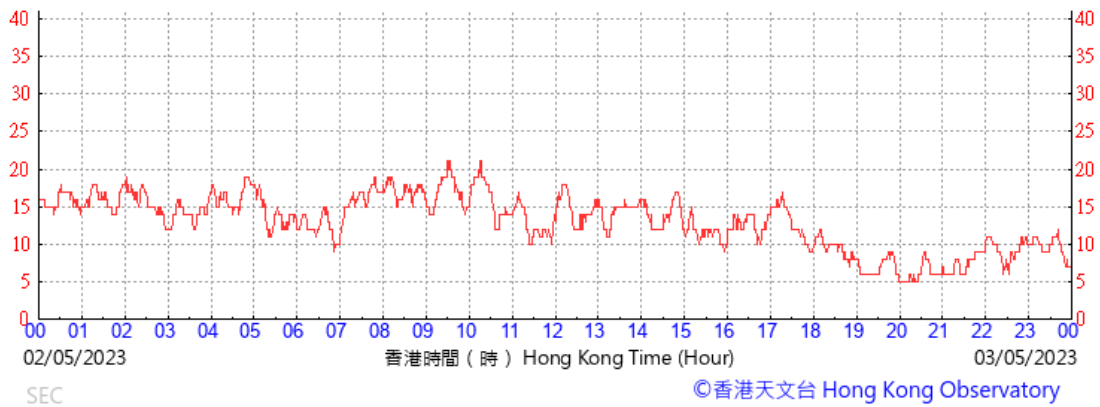
Wind Direction

(於香港時間03/05/2023 00 時 00 分更新) (Updated at 00:00H on 03/05/2023)

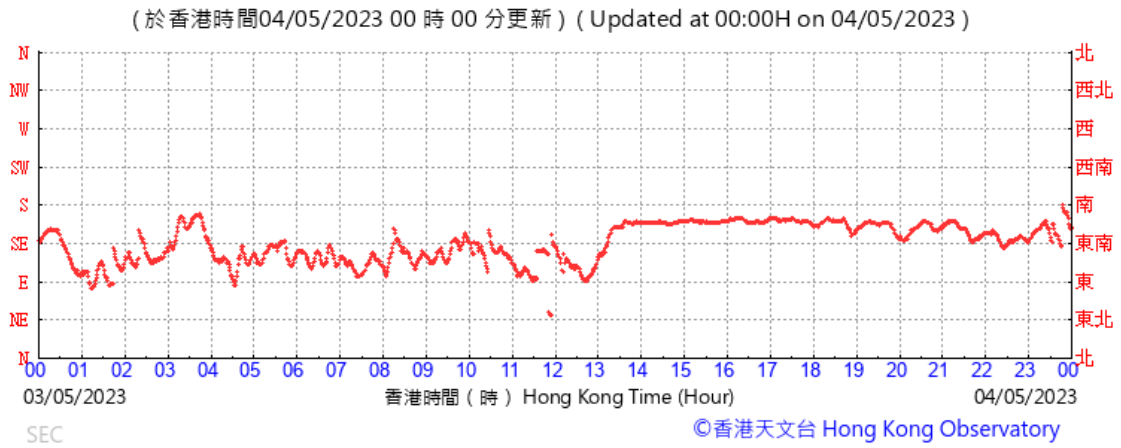


Wind Speed

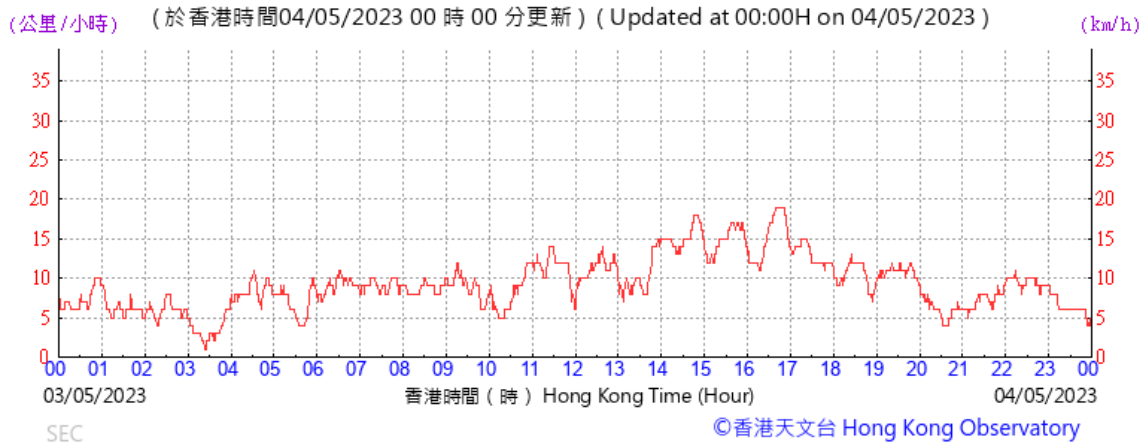
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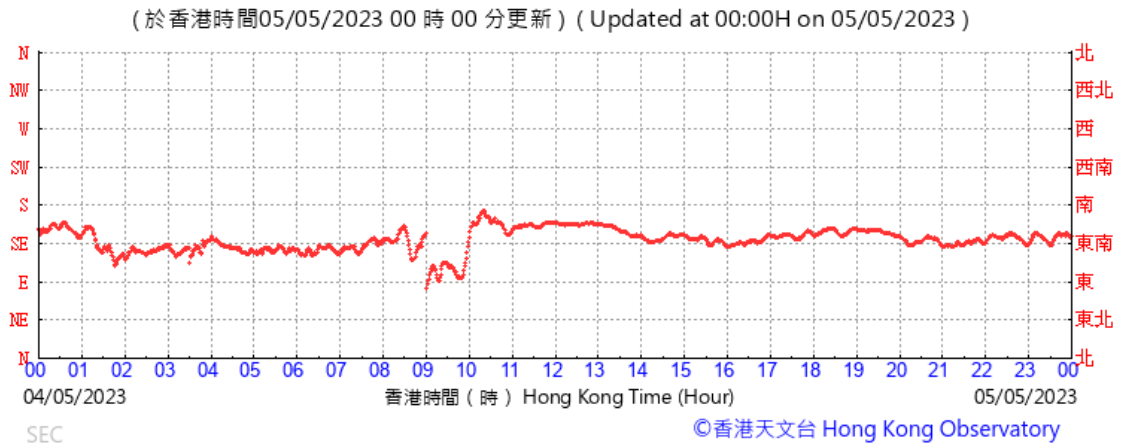
Wind Direction



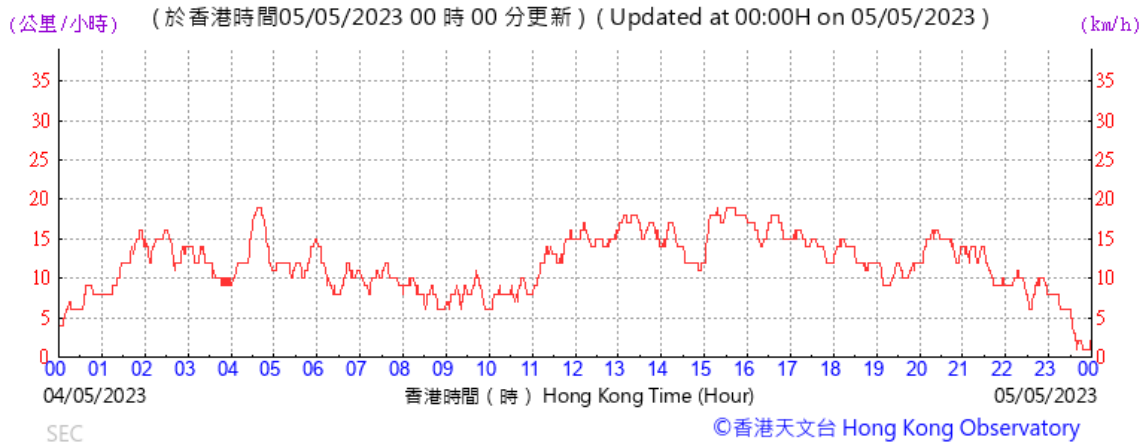
Wind Speed



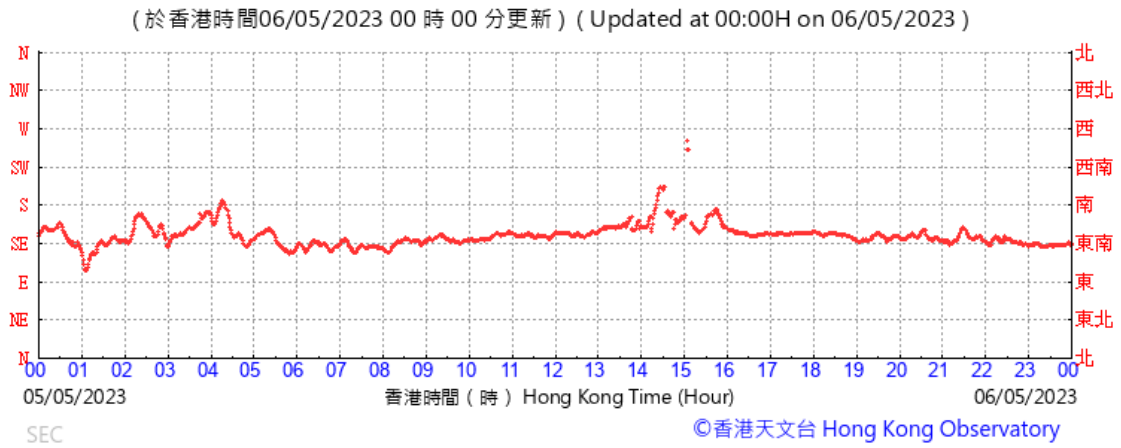
Wind Direction



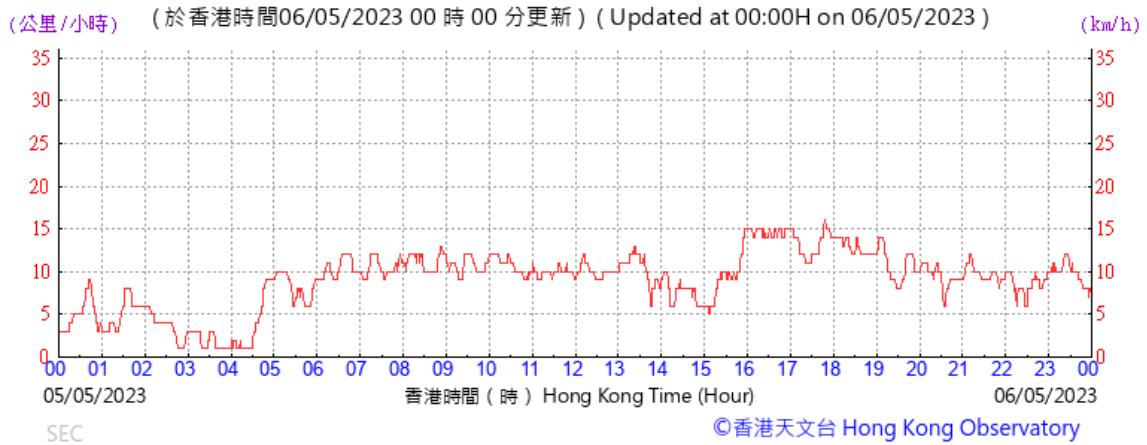
Wind Speed



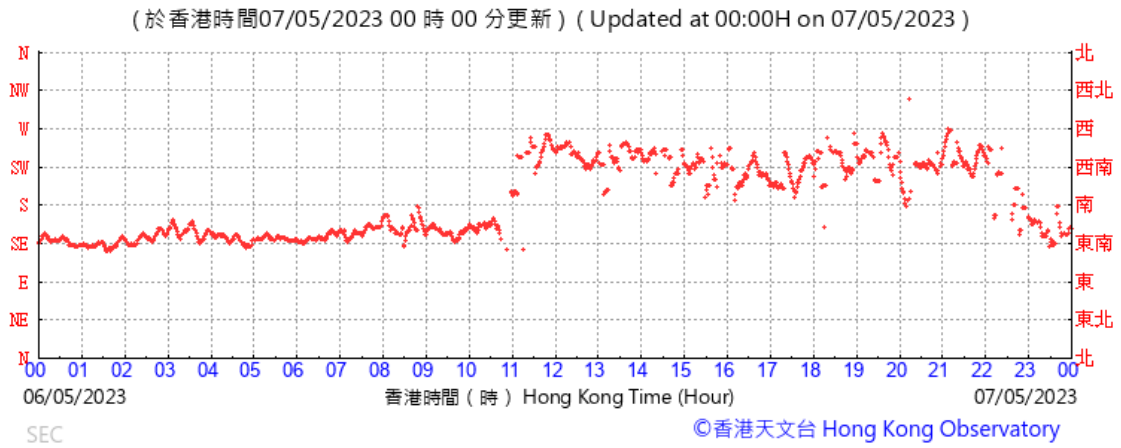
Wind Direction



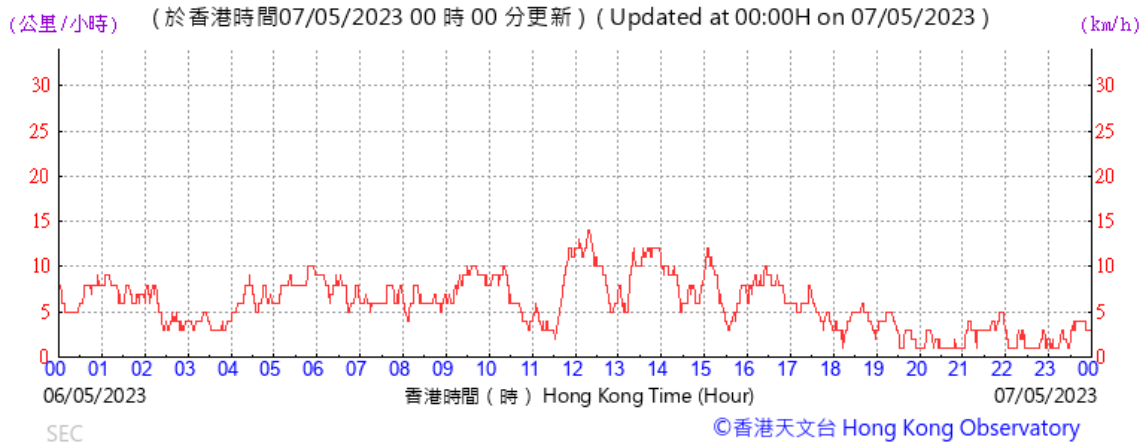
Wind Speed



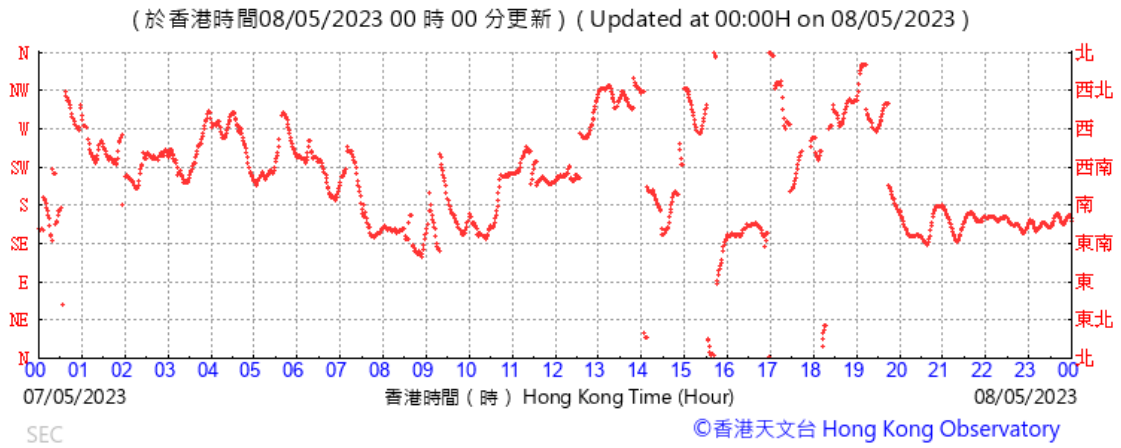
Wind Direction



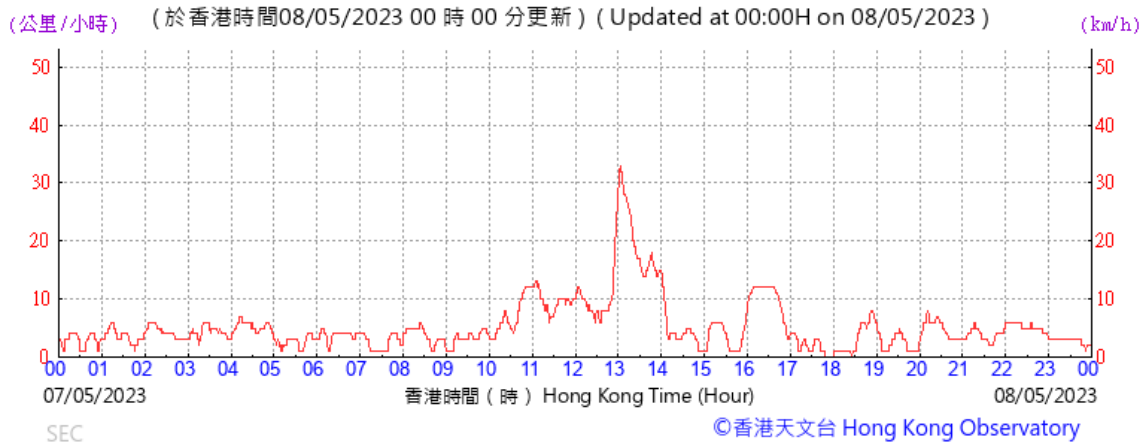
Wind Speed



Wind Direction

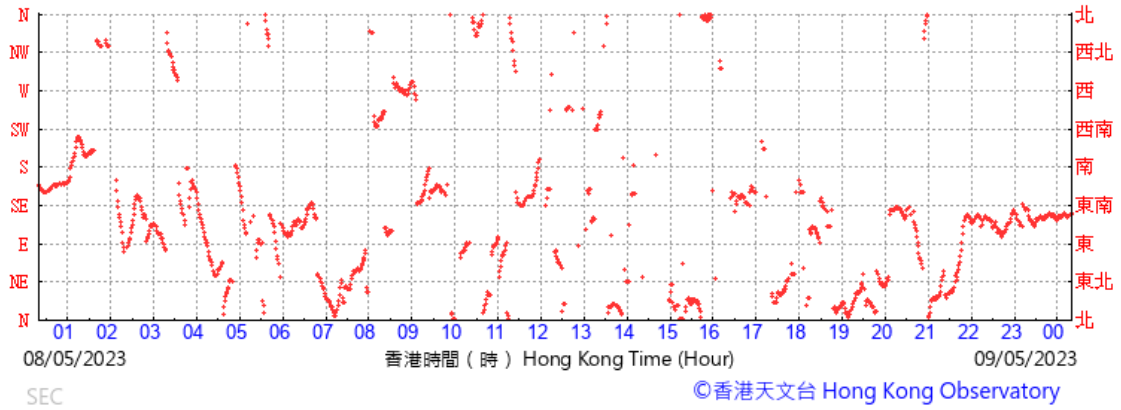


Wind Speed



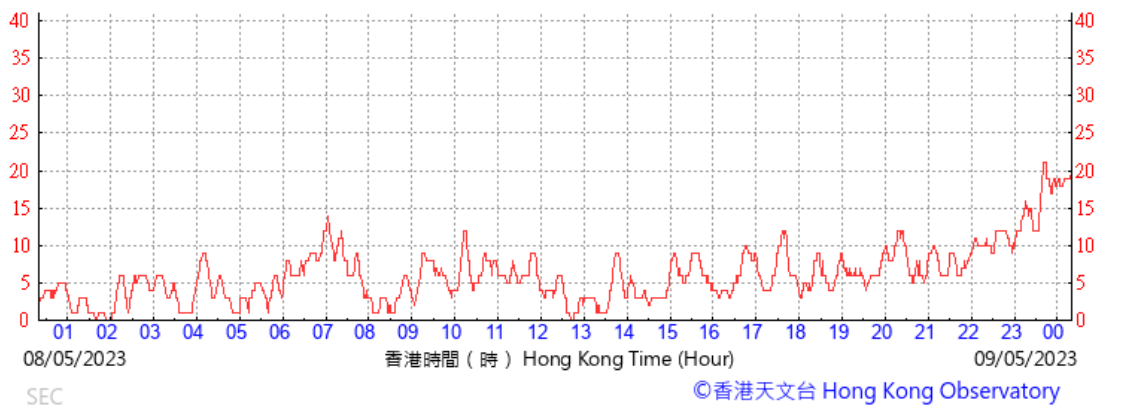
Wind Direction

(於香港時間09/05/2023 00 時 20 分更新) (Updated at 00:20H on 09/05/2023)



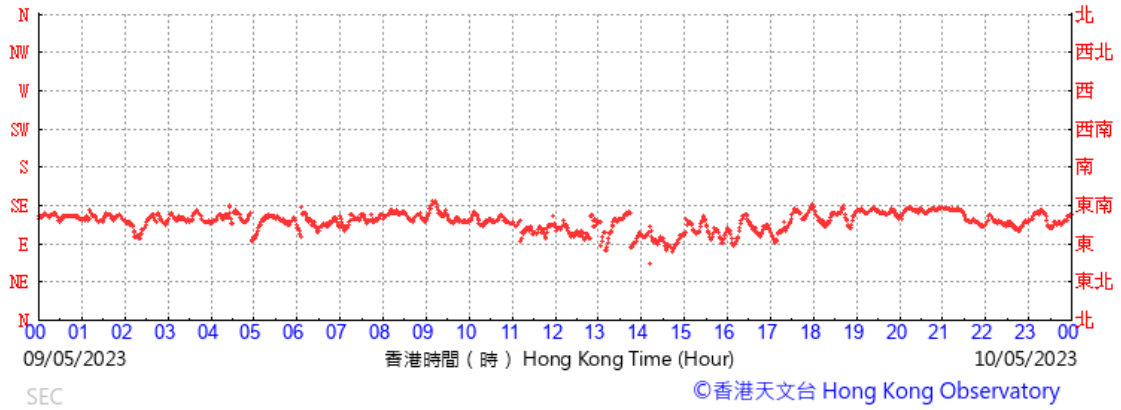
Wind Speed

(公里/小時) (於香港時間09/05/2023 00 時 20 分更新) (Updated at 00:20H on 09/05/2023)



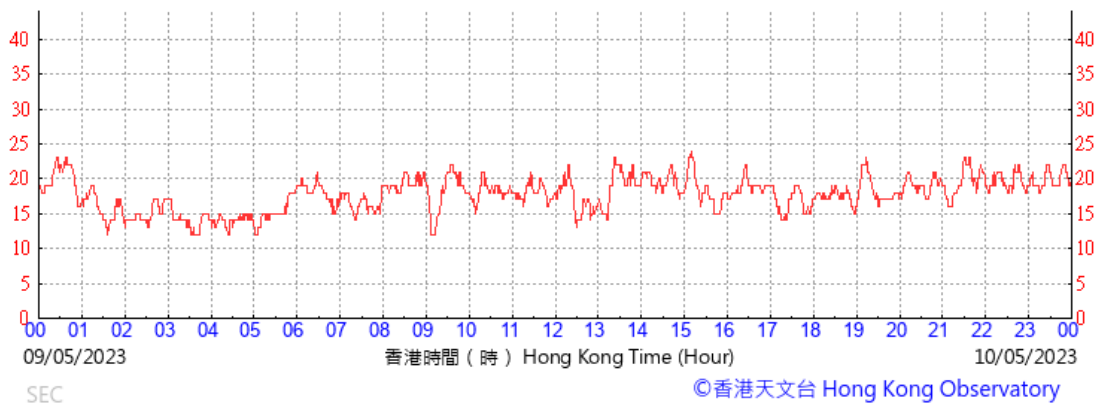
Wind Direction

(於香港時間10/05/2023 00 時 00 分更新) (Updated at 00:00H on 10/05/2023)

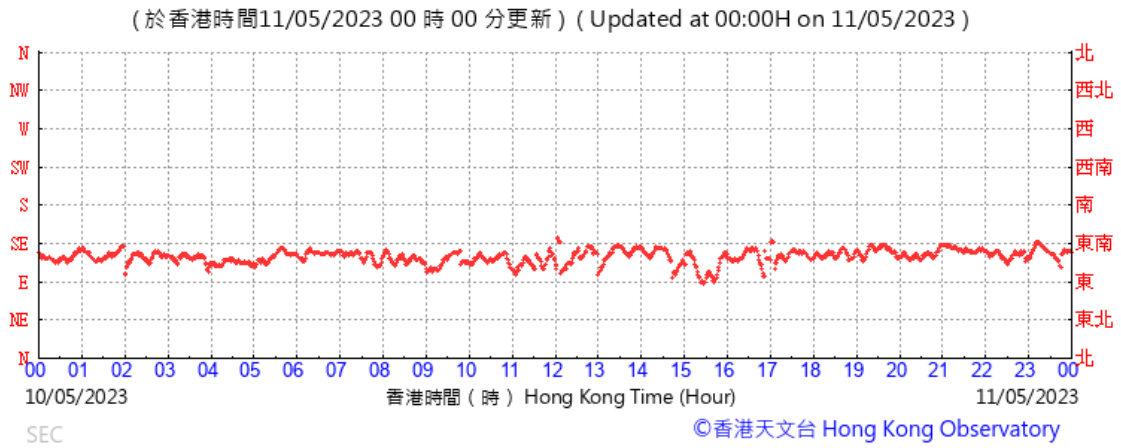


Wind Speed

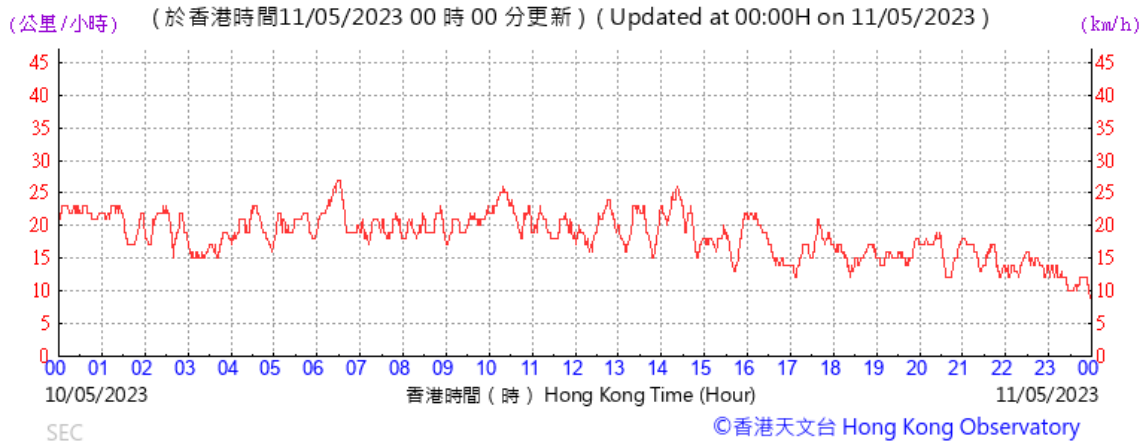
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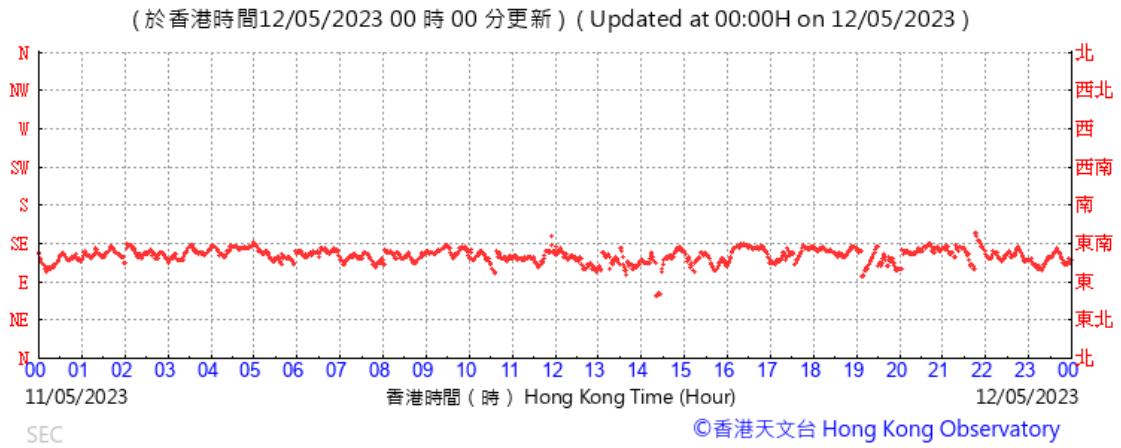
Wind Direction



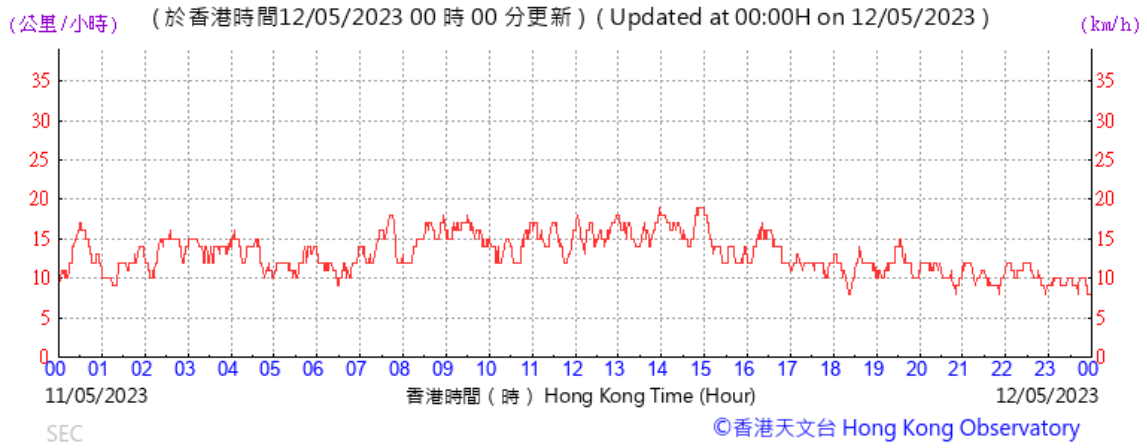
Wind Speed



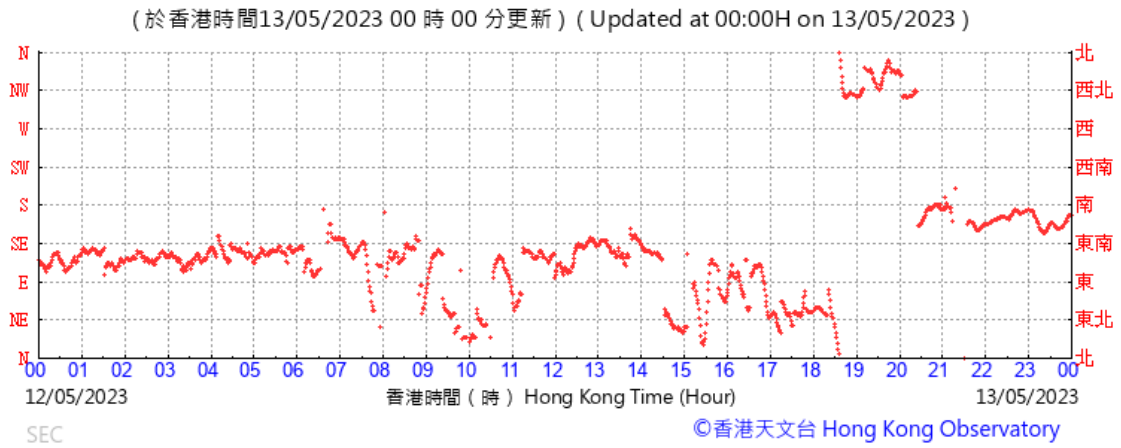
Wind Direction



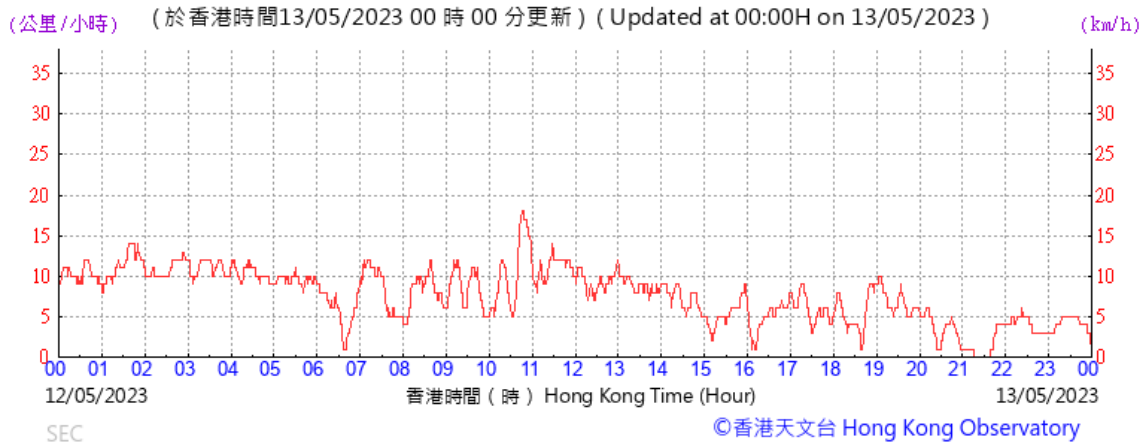
Wind Speed



Wind Direction

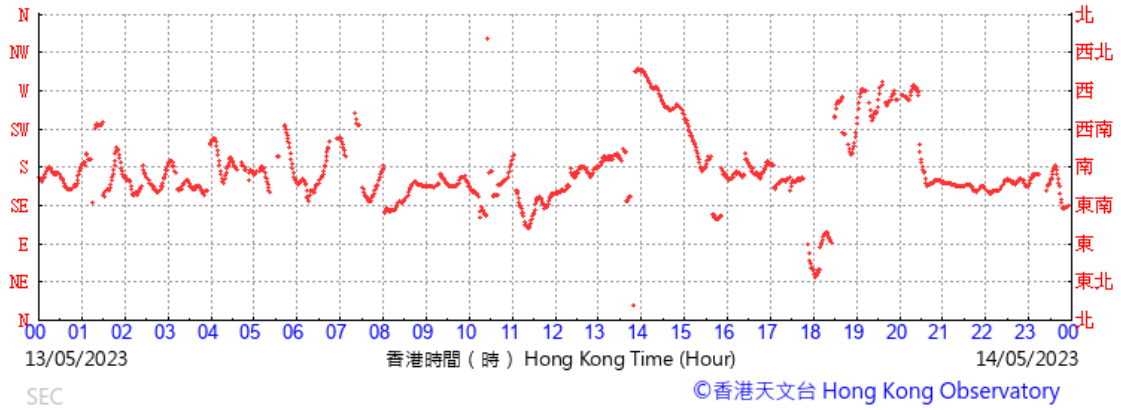


Wind Speed



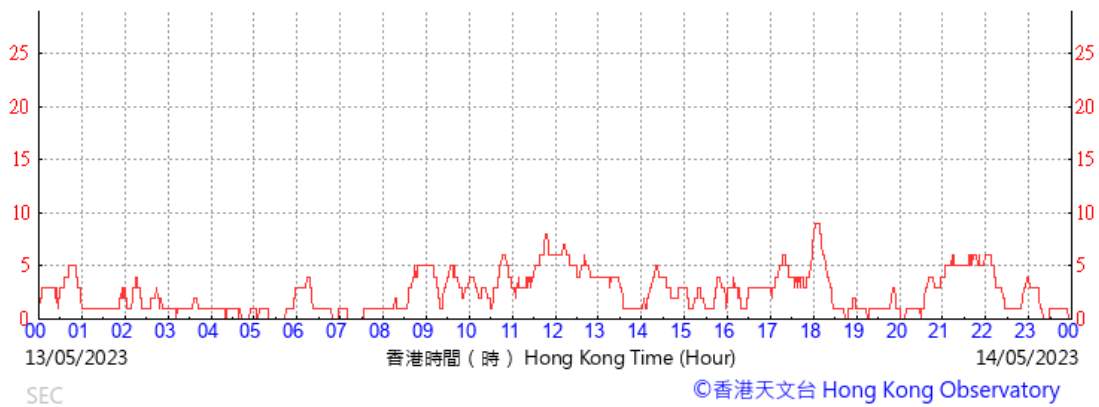
Wind Direction

(於香港時間14/05/2023 00 時 00 分更新) (Updated at 00:00H on 14/05/2023)

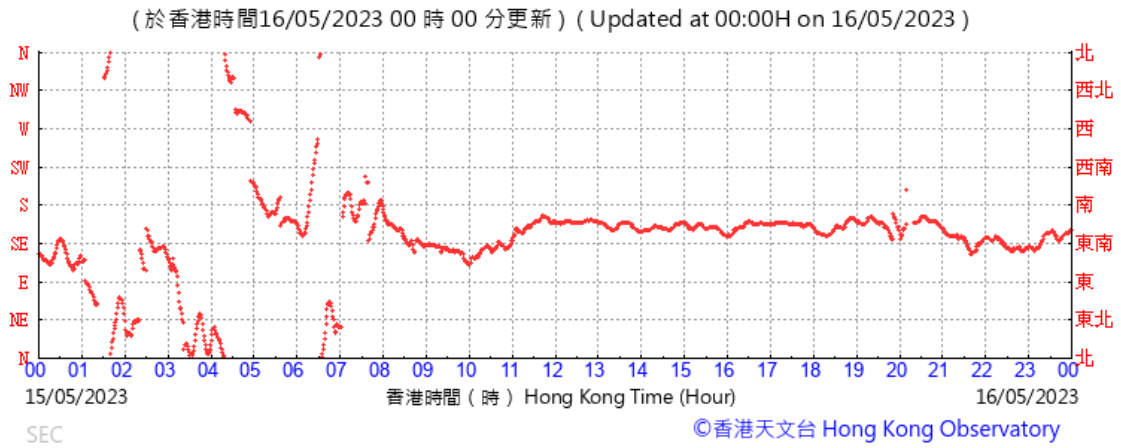


Wind Speed

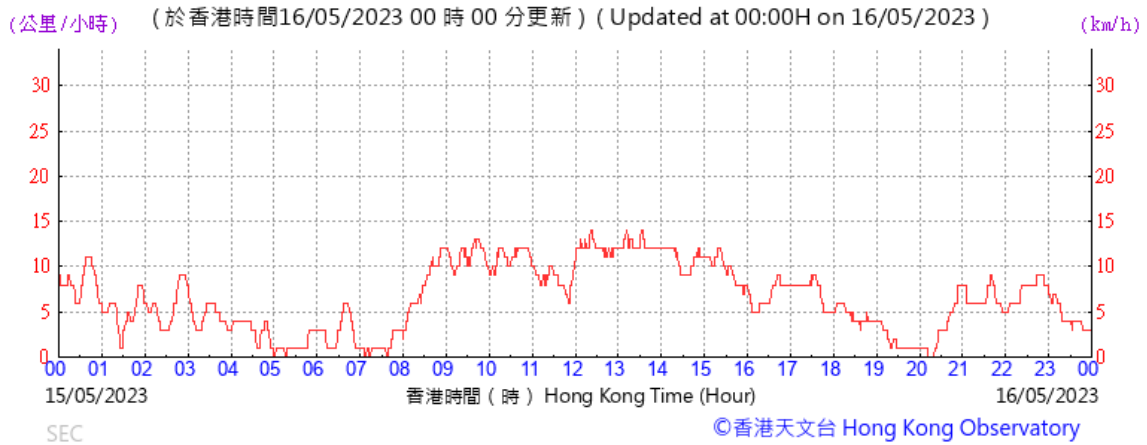
(公里/小時) (於香港時間14/05/2023 00 時 00 分更新) (Updated at 00:00H on 14/05/2023) (km/h)



Wind Direction

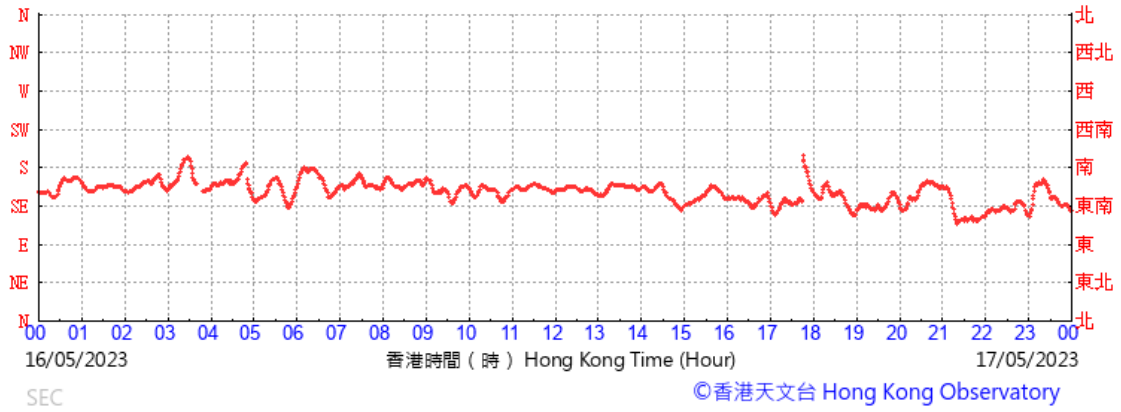


Wind Speed



Wind Direction

(於香港時間17/05/2023 00 時 00 分更新) (Updated at 00:00H on 17/05/2023)



Wind Speed

(公里/小時) (於香港時間17/05/2023 00 時 00 分更新) (Updated at 00:00H on 17/05/2023) (km/h)

