

Our ref: 13-7-2022

13-7-2022

By hand

Environmental Protection Department  
Environmental Assessment Division  
Metro Assessment Group  
Kowloon Section (2)  
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130 Hennessy Road,  
Wan Chai, Hong Kong  
(Attn: Mr. TANG Ho Him, Matthew)

Dear Mr. TANG,

**Contract No. EDO 15/2018**

**Environmental Monitoring Works for Contract No. ED/2018/01 – Kai Tak Development – Stage 4 infrastructure at the Former Runway and South Apron**

**Submission of Monthly EM&A Report for June 2022**

I refer to the Environment Permit (EP) No. EP-337/2009 and EP-445/2013/A for the captioned project.

Pursuant to Condition 3.3 of the EP-337/2009 and Condition of the 3.2 of the EP-445/2013/A, please find enclosed four hard copies and one electronic copy of Monthly EM&A Report for June 2022, which has been verified by the IEC for your reference.

Thank you very much for your attention and please feel free to contact Mr. Lee at 2618 2166 should you require further information.

Yours faithfully,

For and on behalf of

Ka Shing Management Consultant Limited

**AKCL**

Applied knowledge center limited

Company Secretary

Encl. Monthly EM&A report in June 2022

13 July 2022

AECOM Asia Company Limited  
12/F, Grand Central Plaza, Tower 2  
138 Shatin Rural Committee Road  
Shatin, Hong Kong

By Post and Email

Attention: Mr. Clive Cheng

Dear Sir,

**Re: Contract No. ED/2018/01 – Kai Tak Development  
Stage 4 Infrastructure at the Former Runway and South Apron**

**Monthly EM&A Report for June 2022**

Reference is made to the Environmental Team's submission of the Monthly EM&A Report for June 2022 (Version 1.1) certified by the ET Leader and provided to us via email on 13 July 2022.

Please be informed that we have no adverse comment on the captioned submission. We hereby verify the captioned submission in accordance with Condition 3.3 of EP-337/2009 and Condition 3.2 of EP-445/2013/A.

Thank you for your attention. Please do not hesitate to contact the undersigned should you have any queries.

Yours faithfully,

For and on behalf of

Ramboll Hong Kong Limited



Y H Hui

Independent Environmental Checker

c.c.	CEDD	Attn.: Mr. Alex Wong	Fax: 2739 0076
	Ka Shing	Attn.: Mr. Chan Pang	By email
	Penta-Ocean	Attn.: Mr. Daniel Ho	Fax: 2572 4080

**Environmental Monitoring and Audit Report**  
**for**  
**Contract No. ED/2018/01 –**  
**Kai Tak Development – Stage 4 infrastructure at the**  
**former runway and south apron**

**Contract No.: EDO 15/2018**

June 2022

(Version 1.1)

Certified By: \_\_\_\_\_



(Environmental Team Leader)

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## EXECUTIVE SUMMARY

This is the 30<sup>th</sup> Monthly Environmental Monitoring & Audit (EM&A) report which summaries the findings of the EM&A Programme during the reporting period from 1 to 30 June 2022.

### **Breaches of Action and Limit Levels**

- 1) 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.
- 2) 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.
- 3) Construction noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.
- 4) Summary of the non-compliance in the reporting month for the Project is tabulated in Table I.

*Table I Non-compliance Record in the Reporting Month*

Parameter	No. of Exceedance		Action Taken
	Action Level	Limit Level	
1-hr TSP	0	0	N/A
24-hr TSP	0	0	N/A
Construction noise	0	0	N/A

### **Complaint log**

- 5) No complaint was received in the reporting month. Summary of complaints in the reporting month is tabulated in Table II.

*Table II Summary of complaints in the Reporting Month*

Date of complaint received	Date of complaint	Description of complaint	Investigation / Recommendations / Action take	Close-out date / Status
No complaint	N/A	N/A	N/A	N/A

Date of complaint received	Date of complaint	Description of complaint	Investigation / Recommendations / Action take	Close-out date / Status
was received in the reporting month.				

**Notifications of summons and successful prosecutions**

6) No notification of summons and successful prosecutions was received in the reporting month. Summary of summons and successful prosecutions in the reporting month is tabulated in Table III.

*Table III Summary of summons and successful prosecutions in the Reporting Month*

Date of receiving notification of summons or prosecutions	Date of event	Description of event	Action take	Close-out date / Status
No notification of summons and successful prosecutions were received in the reporting month.	NA	NA	NA	NA

**Report changes**

7) There was no reporting change in the reporting month.

**Key construction works in the reporting month**

8) Major construction activities undertaken during the reporting month included:

- North Approach Ramp – Construction of utilities trough
- Bridge D3 – Construction of Bridge Deck
- North Depressed Road – Construction of wall & top slab
- Underpass – Construction of walls and roof slab
- South Approach Ramp – Construction of Permanent Structure
- District Cooling System seawater intake box culvert - reinstatement of the seawall and backfilling works
- Lift 3 – Modification works
- Lift 4 – Construction of linking platform
- South Depressed Road – Installation of ELS system / construction of permanent works
- Rising Main and Water Pipe – Laying of sewage
- Landscaped Deck – Construction of pile caps and installation of columns
- Transformer Room - Construction of permanent structure
- Shing Kai Road – Modification works, laying of storm water drainage pipes
- Lift 1 & 2 – Installation of ELS system
- CLP substation – Construction of wall & intermediate slab
- Noise Barrier – Remaining works, Bus lay-by construction
- Seawater Intake Box Culvert of Saltwater Pumping Station –Installation of sheetpiles and ELS system

**Future key issues**

9) The future key issues and potential impact in the coming month are given in Table IV.

*Table IV Summary of future key issues and potential impact in the coming month*

Future key issues in the coming month	Potential impact
North Approach Ramp – Construction of utilities trough	Noise and Air Quality, Chemical and Waste Management
Bridge D3 – Construction of Bridge Deck	Noise and Air Quality, Landscape and Visual
North Depressed Road – Construction of walls & top slab	Noise and Air Quality, Chemical and Waste Management
Underpass – Construction of walls and roof slab	Noise and Air Quality, Chemical and Waste Management
South Approach Ramp – Construction of Permanent Structure	Noise and Air Quality, Chemical and Waste Management
District Cooling System seawater intake box culvert – backfilling works, reinstatement of the seawall and backfilling	Noise, Air and Water Quality

Future key issues in the coming month	Potential impact
works	
Lift 3 – Modification works	Noise and Air Quality, Chemical and Waste Management
Lift 4 – Construction of linking platform	Noise and Air Quality, Chemical and Waste Management
South Depressed Road – construction of permanent works	Noise and Air Quality, Chemical and Waste Management
Rising Main and Water Pipe – Laying of sewage	Noise, Air and Water Quality
Landscaped Deck – Construction of pile caps and installation of columns	Noise, Air and Water Quality
Transformer Room – Construction of permanent structure	Noise, Air and Water Quality
Shing Kai Road – Modification works, laying of storm water drainage pipes	Noise, Air and Water Quality
Lift 1 & 2 – Installation of ELS system	Noise and Air Quality, Chemical and Waste Management
CLP substation – Construction of wall & intermediate slab	Noise, Air and Water Quality
Noise Barrier – Remaining works, Bus lay-by construction	Noise, Air and Water Quality
Seawater Intake Box Culvert of Saltwater Pumping Station – Installation of sheetpiles and ELS system	Noise, Air and Water Quality

# 1. INTRODUCTION

## Project Background

- 1.1 The Kai Tak Development (KTD) is located in the south-eastern part of Kowloon Peninsula of the HKSAR, comprising the apron and runway areas of the former Kai Tak Airport and existing waterfront areas at To Kwa Wan, Ma Tau Kok, Kowloon Bay, Kwun Tong and Cha Kwo Ling.
- 1.2 Contract No. ED/2018/01 - Kai Tak Development – stage 4 infrastructure at the former runway and south apron (The Project), comprises mainly the design and construction of a dual two-lane Road D3 (Metro Park Section), a single 2-lane Road L12d, a salt water pumping station, a sewage pumping station, landscaped deck and promenade above and adjoining Road D3 (Metro Park Section) respectively, some remaining road works at Road L14, noise barrier at Road D3A, and other associated works at the former runway and south apron. The proposed works are shown in Figure 1 and Figure 2. During the course of the Contract No. ED/2018/01, there may be modification of noise barriers in association with the construction of footbridges connecting to the landscaped deck of Road D3A by developers of adjacent lands (Figure 3). The proposed works and site boundary are shown in Figure 4.
- 1.3 Civil Engineering and Development Department (CEDD) had completed an Environmental Impact Assessment (EIA) and is the Permit Holder.
- 1.4 The construction work under ED/2018/01 comprises the EM&A Manuals (EIA Register Nos. AEIAR-130/2009 for Kai Tak Development and EIA Register Nos. AEIAR-170/2013 for Roads D3A and D4A) and Environmental Permit (EP) Nos. EP-337/2009, EP-445/2013 and Variation to the EP (VEP) No. EP-445/2013/A.
- 1.5 Air quality and noise monitoring has been proposed in the EM&A Manual with EIA Register Nos. AEIAR-130/2009 for Kai Tak Development while no air quality and noise monitoring are proposed in EM&A Manual with EIA Register Nos. AEIAR-170/2013 for Roads D3A and D4A.



## **Project Organization**

1.6 The project organization chart and with respect to the EM&A programme is shown in Appendix A. Information of key personnel contact names and telephone numbers are summarized in Table 1.1.

*Table 1.1 Contact Information of Key Personnel*

Party	Role	Contact Person	Position	Phone No.	Fax No.
Civil Engineering and Development Department (CEDD)	Project Proponent	Mr. Alex Wong	Senior Engineer	3579 2452	2739 0076
		Ms. Chan Ka Yan	Engineer	3579 2458	2739 0076
AECOM Asia Co. Ltd. (AECOM)	Supervisor (act as Engineers' Representative (ER) listed in EM&A Manual)	Mr. Clive Cheng	CRE	3911 4201	3911 4288
Ramboll Hong Kong Limited (Ramboll)	Independent Environmental Checker (IEC)	Mr. Y H Hui	IEC	3465 2850	3465 2899
Ka Shing Management Consultant Limited (Ka Shing)	Environmental Team (ET)	Mr. Chan Pang	ET Leader	6082 2973	2120 7752
Penta-Ocean Construction Co., Ltd. (Penta-Ocean)	Contractor	Mr. Lulu Mar	Environmental Officer	6845 0626	3465 8898

## **Works Area and Construction Programme**

1.7 The construction works commenced on 20 January 2020. The construction programme of the Project is given in Appendix B.

## **Construction works undertaken during reporting month**

1.8 Major construction works of the Project in the reporting month are summarized in Table 1.2:

*Table 1.2 Major activities of the Project during reporting month*

North Approach Ramp – Construction of utilities trough	Bridge D3 – Construction of Bridge Deck
North Depressed Road – Construction of walls & top slab	Underpass – Construction of walls and roof slab
South Approach Ramp – Construction of Permanent Structure	District Cooling System seawater intake box culvert - reinstatement of the seawall and backfilling works
Rising Main and Water Pipe – Laying of sewage	Lift 3 – Modification works
Lift 4 – Construction of linking platform	South Depressed Road – Installation of ELS system / construction of permanent works
Landscaped Deck – Construction of pile caps and installation of columns	Transformer Room – Construction of permanent structure
Shing Kai Road – Modification works, laying of storm water drainage	Lift 1 &2 – Installation of ELS system
CLP substation – Construction of wall & intermediate slab	Noise Barrier – Remaining works, Bus lay-by construction
Seawater Intake Box Culvert of Saltwater Pumping Station – Installation of sheetpiles and ELS system	

## **Submission Status under the Environmental Permits**

1.9 The status of required submission under Environmental Permit (EP) conditions under EP-337/2009, EP-445/2013 and Variation to the EP (VEP) No. EP-445/2013/A are summarized in Table 1.3.

*Table 1.3 Summary of Status of Required Submission of EPs*

EP Condition EP-337/2009	EP Condition EP-445/2013	EP Condition EP-445/2013/A	Submission	Submission Date
Condition 1.11	Condition 1.12	Condition 1.12	Notification of Commencement Date of Construction of the Project	6 Jan 2020
Condition 2.3	Condition 2.3	Condition 2.3	Management Organization of Main Construction Companies	9 Sep 2019
Condition 2.3	Condition 2.3	Condition 2.3	Updated Management	17 Aug 2021

EP Condition EP-337/2009	EP Condition EP-445/2013	EP Condition EP-445/2013/A	Submission	Submission Date
			Organization of Main Construction Companies	
Condition 2.4	Condition 2.4	Condition 2.4	Design Drawings	6 Jan 2020
Condition 2.11	Condition 2.5	Condition 2.5	Landscape Mitigation Plans	13 Nov 2020
Condition 2.1	Condition 2.5	Condition 2.5	Landscape Mitigation Plans (Revision 2)	18 May 2021
Condition 3.2	NA	NA	Baseline Monitoring Report	2 Jan 2020
Condition 3.2	NA	NA	Revised Baseline Monitoring Report	28 Mar 2020
Condition 3.3	Condition 3.2	Condition 3.2	Monthly EM&A Report (May 2022)	13 June 2022

## 2. AIR QUALITY MONITORING

### Monitoring Requirements

2.1 In accordance with EM&A Manuals (EIA Register Nos. AEIAR-130/2009), impact air quality monitoring shall be carried out during the construction phase of the Project. For regular impact monitoring, a sampling frequency of at least once in every six days will be strictly observed at all of the monitoring stations for 24-hour TSP. For 1-hour TSP monitoring, the sampling frequency of at least three times in every six days will be undertaken when the highest dust impact occurs.

### Monitoring Locations

2.2 Three designated monitoring stations were selected for air quality monitoring programme. Impact air quality monitoring was conducted at three air quality monitoring stations in the reporting month. Table 2.1 describes the air quality monitoring locations, which are also depicted in Figure 5.

*Table 2.1 Locations of Air Quality Monitoring Stations*

Air Quality Monitoring Locations for the Project	Location of Measurement
AM3 - Sky Tower	Podium floor near T7
AM4(A) - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop	Rooftop
AM7 - Hong Kong Children's Hospital	Rooftop

### Monitoring Parameters, Frequency and Duration

2.3 The air quality monitoring locations and monitoring frequency are listed in Table 2.2.

*Table 2.2 Air Quality Monitoring Parameters, Frequency and Duration*

Air Monitoring Station	Location for Measurement	Parameter	Duration	Frequency
AM3 - Sky Tower	Podium floor near T7	- 24-hour average TSP  - 1-hour average TSP	- 24 hours	- Once every 6 days
AM4(A) - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop	Rooftop		- 1 hour	- Three times every 6 days
AM7 - Hong Kong Children's Hospital	Rooftop			

2.4 The monitoring schedule for reporting month and next month is presented in Appendix C.

2.5 Photographic records of the impact monitoring setup are shown in Appendix D.

### **Monitoring Equipment**

2.6 24-hour average TSP and 1-hour average TSP levels were measured for impact monitoring. 24-hour average TSP levels were measured by the High Volume Samplers (HVS) and 1-hour average TSP levels were measured by direct reading method to indicate short-term impacts. Wind data monitoring equipment was set up at conspicuous locations for logging wind speed and wind direction near to the dust monitoring locations. Table 2.3 summarizes the equipment to be used in the air quality monitoring.

*Table 2.3 Air Quality Monitoring Equipment*

Equipment	Model	Quantity
HVS Sampler	TE-5170 X c/w of TSP sampling inlet	3
Calibrator	TISCH TE-5025A	1
1-hour TSP Dust Meter	TSI Model AM510 SidePak Personal Aerosol Monitor	2
Wind Anemometer	Davis Vantage Pro2 Weather Station	1

2.7 High volume samplers (HVS) (TE-5170 X c/w of TSP sampling inlet) comprising with appropriate sampling inlets were employed for 24-hour TSP monitoring. The sampler was composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complied with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50).

2.8 Calibration certificates, catalogue of equipment are given in Appendix E.

## **Monitoring Methodology and QA/QC Procedure**

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

#### **Operating/Analytical Procedures**

2.9 Setup criteria of HVS are shown as follows:

- A horizontal platform with appropriate support to secure the samplers against gusty wind was provided.
- No two samplers were placed less than 2m apart.
- The distance between the sampler and an obstacle, such as buildings, was at least twice the height that the obstacle protrudes above the sampler.
- A minimum of 2m of separation from walls, parapets and penthouses was set for the rooftop samples.
- A minimum of 2m separation from any supporting structure, measured horizontally was set.
- No furnaces or incineration flues was nearby.
- Airflow around the sampler was unrestricted.
- Any wire fence and gate, to protect the samplers, was not caused any obstruction during monitoring.
- Permission were obtained to setup the samplers and to obtain access to the monitoring stations.
- A secured supply of electricity was provided to operate the samplers.

2.10 Prior to the commencement of the dust sampling, the flow rate of the HVS was properly set (between 1.1 m<sup>3</sup>/min. and 1.7 m<sup>3</sup>/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.

2.11 For TSP sampling, Glass Fiber Filter Media 8" x 10" have a collection efficiency of > 99 % for particles of 0.3 μm diameter were used.

2.12 The power supply was checked to ensure the sampler worked properly and then placed any filter media at the designated air monitoring station.

- 2.13 The filter holding frame was removed by loosening the four nuts and a weighted and conditioned filter was carefully centered with the stamped number upwards, on a supporting screen.
- 2.14 The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts. The applied pressure was sufficient to avoid air leakage at the edges.
- 2.15 The shelter lid was closed and secured with the aluminium strip.
- 2.16 The timer was programmed. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).
- 2.17 After sampling, the filter was removed from the HVS and put into a clean and labeled seal plastic bag to avoid cross contamination. The elapsed time was also be recorded. The sampled filters were sent to the HOKLAS accredited or other internationally accredited laboratory for weighting.

#### Maintenance/Calibration

2.18 The following maintenance/calibration are required for the HVS:

- The HVS and their accessories were properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking were made to ensure that the equipment and necessary power supply are in good working condition.
- High volume samplers were calibrated with at bi-monthly intervals using TE-5025A Calibration Kit throughout all stages of the air quality monitoring.

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

#### Measurement Procedures

2.19 The measurement procedures of the 1-hour TSP were conducted in accordance with the Manufacturer's Instruction Manual as follows:

- Set up the dust meter on a tripod at 1.2m level.
- Turned on the dust meter and check the battery, if too low, change new ones. Pointed the meter to the source area or the planned measurement area.

- The zero calibration of the instrument was conducted before and after each sampling.
- TSP levels were recorded for 1-hour with 5-minute data logging interval.
- Recorded down the general meteorological conditions, Test ID no., start/end time, spot check reading at each sampling location for data processing.
- Recorded any activities that may generate dust during measurement period.

### Maintenance/Calibration

2.20 The following maintenance/calibration are required for the direct dust meters:

- To validity the accuracy of dust meter, compare the results measured by dust meter and HVS by direct reading method every 12 months throughout all stages of the air quality monitoring.

### Wind Data Monitoring

2.21 Wind Anemometer was installed at the roof-top of AM7 - Hong Kong Children's Hospital with 10m above ground and clear of constructions or turbulence caused by the buildings.

2.22 The wind data was captured by a data logger and the data was downloaded at least once per month for analysis.

2.23 The wind data monitoring equipment will be re-calibrated at least once every six months.

2.24 Wind direction is divided into 16 sectors of 22.5 degrees each.

2.25 Details of weather information during the monitoring period are shown in Appendix F.

### Action and Limit Levels

2.26 The Action and Limit Levels of 24-hour average TSP and 1-hour average TSP are summarized in Table 2.4 and Table 2.5 respectively.



*Table 2.4 Action and Limit Levels of 24-hour average TSP for Construction Dust Monitoring*

Parameter	Air Monitoring Station	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
24-hour average TSP	AM3	182	260
	AM4(A)	187	260
	AM7	181	260

*Table 2.5 Action and Limit Levels of 1-hour average TSP for Construction Dust Monitoring*

Parameter	Air Monitoring Station	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
1-hour average TSP	AM3	297	500
	AM4(A)	326	500
	AM7	315	500

### **Impact Air Quality Monitoring results**

2.27 Impact monitoring results for 24-hour average TSP and 1-hour average TSP levels at the designed air quality monitoring stations are summarized in Table 2.6 and Table 2.7 respectively.

*Table 2.6 Summary of 24-hour average TSP Monitoring Data during the reporting month*

Air Monitoring Station	Average TSP Concentration, $\mu\text{g}/\text{m}^3$	Range, $\mu\text{g}/\text{m}^3$	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AM3	44	27 – 75	182	260
AM4(A)	47	34 – 64	187	260
AM7	43	29 – 65	181	260

*Table 2.7 Summary of 1-hour average TSP Monitoring Data during the reporting month*

Air Monitoring Station	Average TSP Concentration, $\mu\text{g}/\text{m}^3$	Range, $\mu\text{g}/\text{m}^3$	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AM3	44	25 – 86	297	500
AM4(A)	47	29 – 76	326	500
AM7	36	24 – 52	315	500

2.28 There was no Action and Limit Level exceedance of 24-hour average TSP and 1-hour average TSP levels recorded during the reporting month.

2.29 Graphical presentation and detailed monitoring results of 24-hour average TSP and 1-hour average TSP levels are shown in Appendix G and Appendix H respectively.

2.30 The Event and Action Plan is provided in Appendix I.

2.31 Non-project related construction activities in the adjacent construction sites were observed during the reporting period and may affect the monitoring results.

### 3. NOISE MONITORING

#### Monitoring Requirements

- 3.1 In accordance with EM&A Manuals (EIA Register Nos. AEIAR-130/2009), impact noise monitoring shall be carried out during the construction phase of the Project.
- 3.2 Regular monitoring,  $L_{Aeq, 30\text{-minute}}$ , for each station will be on a weekly basis and conduct one set of measurements between 0700 – 1900 on normal weekdays.
- 3.3 If construction works are extended to include works during 1900 – 0700 as well as public holidays and Sundays, additional weekly impact monitoring will be carried out during the respective restricted hours periods.

#### Monitoring Locations

- 3.4 Two designated monitoring stations were selected for noise monitoring programme. Impact noise monitoring was conducted at two noise monitoring stations in the reporting month. Table 3.1 describes the noise monitoring locations, which are also depicted in Figure 6.

*Table 3.1 Locations of Noise Monitoring Stations*

Noise Monitoring Locations for the Project	Location of Measurement
M11 - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop	Rooftop (Façade)
M12 - Hong Kong Children's Hospital	Rooftop (Façade)

#### Monitoring Parameters, Frequency and Duration

- 3.5 The noise monitoring locations and monitoring frequency are listed in Table 3.2.

*Table 3.2 Noise Monitoring Parameters, Frequency and Duration*

Noise Monitoring Station	Location for Measurement	Parameter	Frequency and Duration
M11 - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop	Rooftop (Façade)	$L_{Aeq}$ , $L_{A10}$ and $L_{A90}$	30 - minutes measurement at each monitoring station between 0700 – 1900 hrs on normal weekdays (Monday to Saturday) at frequency of once per week.
M12 - Hong Kong Children's Hospital	Rooftop (Façade)		

3.6 The monitoring schedule for reporting month and next month is presented in Appendix C.

3.7 Photographic records of the monitoring setup are shown in Appendix D.

### **Monitoring Equipment**

3.8 As referred to in the Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO), sound level meters in compliance with the IEC 61672-1 (Type 1) standard [this standard replaced the International Electrotechnical Commission Publications 60651:1979 (Type 1) and 60804:1985 (Type 1)] were used for noise monitoring. Table 3.3 summarizes the equipment to be used in the noise monitoring.

*Table 3.3 Noise Monitoring Equipment*

Equipment	Model	Quantity
Sound Level Meter	RION NL52	2
Sound Level Calibrator	RION NC 74	1
Sound Level Calibrator	RION NC 75	1
Air Flowmeter	TSI TA440 Air Velocity	2

3.9 Calibration certificates, catalogue of equipment are given in Appendix J.

### **Monitoring Methodology and QA/QC Procedure**

3.10 The noise level measurement was conducted at 1m from the exterior of the nearby noise sensitive receivers building façade and at 1.2m above the ground and facing to the source area or the planned measurement area.

3.11 No noise measurement was conducted in the presence of fog, rain, wind with a steady speed

exceeding 5 m/s or wind with gusts exceeding 10 m/s. Air flow was measured by air flow meter.

3.12 Turned on the sound level meter and check the battery, if too low, change new ones.

3.13 Calibration was conducted immediately prior to and after each noise measurement, the accuracy of the sound level meters was checked by using sound calibrator generating 1,000 Hz with 94dB. Measurement data was found to be valid only if the calibration levels from before and after the noise measurement agreed to within 1.0 dB.

3.14 Noise level was recorded.

3.15 Recorded any activities that may generate noise during measurement period.

### **Maintenance and Calibration**

3.16 The microphone head of the sound level meter and calibrator was cleaned with a soft cloth at quarterly intervals.

3.17 The sound level meter and sound calibrator were calibrated annually.

3.18 Calibration for sound level meter was conducted immediately prior to and following each noise measurement by using sound calibrator generating a known sound pressure level at a known frequency (1,000 Hz with 94dB). Measurements may be accepted as valid only if the calibration levels from before and after the noise measurement agree to within 1.0 dB.

### **Action and Limit Levels**

3.19 The Baseline Noise Levels and Action and Limit Levels for construction noise is presented in Table 3.4.

*Table 3.4 Baseline Noise Level and Action and Limit Levels for Construction Noise Monitoring*

Time Period	Noise Monitoring Station	Baseline Noise Levels, dB (A)	Action Level	Limit Level <sup>^</sup>
0700 – 1900 on normal weekdays	M11	68.3	When one documented complaint is received.	75 dB(A)
	M12	61.9		

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

**Impact Noise Monitoring results**

3.20 Impact noise monitoring results at the designed noise monitoring stations are summarized in Table 3.5 respectively.

*Table 3.5 Summary of Noise Monitoring Data during the reporting month*

Noise Monitoring Station	Measured $L_{Aeq, 30-min}$ , Average, dB(A)	Measured $L_{Aeq, 30-min}$ , Range, dB(A)	Action Level	Limit Level <sup>^</sup>
M11	68.1	66.7 – 69.0	When one documented complaint is received	75 dB(A)
M12	65.1	64.1 – 66.0		

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

3.21 There were no action level exceedance of noise monitoring and limit level exceedance of  $L_{Aeq, 30min}$  recorded during the reporting month.

3.22 Graphical presentation and detailed monitoring results are shown in Appendix K.

3.23 The Event and Action Plan is provided in Appendix L.

3.24 Non-project related construction activities in the adjacent construction sites were observed during the reporting period and may affect the monitoring results.

## 4. COMPARISON OF EM&A RESULTS WITH EIA PREDICTIONS

4.1 The environmental impacts predictions were given in Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design and Construction of Advance Works - Investigation, Design and Construction - Kai Tak Development Environmental Impact Assessment Report, EIA Register Nos. AEIAR-130/2009 for Kai Tak Development (The EIA Report). The EM&A data was compared with the EIA predictions as summarized in Table 4.1 to Table 4.3.

*Table 4.1 Comparison of 24-hour average TSP Monitoring Data with EIA predictions*

Air Monitoring Station	ASR No. in EIA report	Predicted Cumulative Maximum 24-hour average TSP concentration		Measured 24-hr average TSP in Reporting Month (June 2022) $\mu\text{g}/\text{m}^3$
		Scenario 1 (Mid 2009 to Mid 2013), $\mu\text{g}/\text{m}^3$	Scenario 2 (Mid 2013 to Late 2016), $\mu\text{g}/\text{m}^3$	
AM3 - Sky Tower	A40 <sup>^</sup>	106	138	27 – 75
AM4(A) - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop	A43 <sup>^</sup>	123	195	34 – 64
AM7 – Hong Kong Children's Hospital	PA60	NA	NA	29 – 65

Note:

<sup>^</sup> Prediction results are given in the Table 3.13 of the EIA report EIA Register Nos. AEIAR-130/2009 for Kai Tak Development.

*Table 4.2 Comparison of 1-hour average TSP Monitoring Data with EIA predictions*

Air Monitoring Station	ASR No. in EIA report	Predicted Cumulative Maximum 1-hour average TSP concentration		Measured 1-hr average TSP in Reporting Month (June 2022) $\mu\text{g}/\text{m}^3$
		Scenario 1 (Mid 2009 to Mid 2013), $\mu\text{g}/\text{m}^3$	Scenario 2 (Mid 2013 to Late 2016), $\mu\text{g}/\text{m}^3$	
AM3 - Sky Tower	A40	217 <sup>^</sup>	247 <sup>^</sup>	25 – 86
AM4(A) - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop*	A43	283 <sup>^</sup>	409 <sup>^</sup>	29 – 76
AM7 – Hong Kong Children's Hospital	PA60	NA	NA	24 – 52

Note:

<sup>^</sup> Prediction results are given in the Table 3.13 of the EIA report EIA Register Nos. AEIAR-130/2009 for Kai Tak Development.

*Table 4.3 Comparison of Noise Monitoring Data with EIA predictions*

Noise Monitoring Station	NSR No. in EIA report	Predicted Mitigated Construction Noise Levels during Normal Daytime Working Hour L <sub>Aeq, 30min</sub> , dB(A)	Measured Noise Level in Reporting Month (June 2022) L <sub>Aeq, 30min</sub> , dB(A)
M11 - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop	N18	50 – 76*	66.7 – 69.0
M12 - Hong Kong Children's Hospital	PN83, PN84, PN84A	NA	64.1 – 66.0

Note:

\* Prediction results are given in the Table 3.20 of the EIA report EIA Register Nos. AEIAR-130/2009 for Kai Tak Development.

- 4.2 24-hour TSP monitoring results at AM3 and AM4(A) were recorded lower than the prediction in the EIA Report. Non-project related construction activities in the adjacent construction sites were observed during the reporting period and may affect the monitoring results.
- 4.3 No prediction in the EIA Report for 24-hour TSP monitoring results at AM7.
- 4.4 1-hour TSP monitoring results at AM3 and AM4(A) were recorded lower than the prediction in the EIA Report. Non-project related construction activities in the adjacent construction sites were observed during the reporting period and may affect the monitoring results.
- 4.5 No prediction in the EIA Report for 1-hour TSP monitoring results at AM7.
- 4.6 Noise monitoring results at M11 were recorded lower than the prediction in the EIA Report. Non-project related construction activities in the adjacent construction sites were observed during the reporting period and may affect the monitoring results.
- 4.7 No prediction in the EIA Report for noise monitoring results at M12.



## 5. LANDSCAPE AND VISUAL MONITORING

5.1 In accordance with EM&A Manuals (EIA Register Nos. AEIAR-130/2009 and AEIAR-170/2013), Landscape and Visual Monitoring shall be carried out during the construction phase of the Project. Regular impact monitoring will be conducted at least once per week.

### **Results and Observations**

5.2 Site inspections were carried out on a weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site.

5.3 Site inspections were conducted on 2, 8, 16, 23 and 30 June 2022 in the reporting month.

5.4 The summaries of site audits are attached in Table 5.1.

*Table 5.1 Summary of observations of Landscape and Visual impact during the reporting month*

Inspection Date	Key Observations	Recommendations / Actions	Close-out Date / Status
2 June 2022	No	NA	NA
8 June 2022	No	NA	NA
16 June 2022	No	NA	NA
23 June 2022	No	NA	NA
30 June 2022	No	NA	NA

5.5 No non-compliance of the landscape and visual impact was recorded in the reporting month.

5.6 Should non-compliance of the landscape and visual impact occur, action in accordance with the action plan presented in Appendix M shall be performed.

## 6. ENVIRONMENTAL SITE INSPECTION AND AUDIT

### Site Inspection

- 6.1 Site inspections were carried out on a weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site.
- 6.2 Site inspections were conducted on 2, 8, 16, 23 and 30 June 2022 in the reporting month.
- 6.3 The summaries of site audits are attached in Table 6.1.

*Table 6.1 Summary of site inspections observations during the reporting month*

Inspection Date	Key Observations	Recommendations / Actions	Close-out Date / Status
2 June 2022	N/A	N/A	N/A
8 June 2022	N/A	N/A	N/A
16 June 2022	N/A	N/A	N/A
23 June 2022	N/A	N/A	N/A
30 June 2022	 <p>Observation: The accumulated waste should be removed.</p>	 <p>Action Taken: The accumulated waste was cleared.</p>	Closed-out on 07 July 2022

### Status of Waste Management

- 6.4 The amount of wastes generated by the major site activities of the work contracts within the Project during the reporting month is shown in Appendix N.

6.5 The Contractor was registered as a chemical waste producer for the Project. The Contractor was reminded that chemical waste containers should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

### **Status of Environmental Licenses, Notification and Permits**

6.6 A summary of the relevant permits, licenses and/or notifications on environmental protection for the Project is shown in Table 6.2.

*Table 6.2 Summary of Environmental Licenses, Notifications and Permits*

Environmental Licenses, Notifications and Permits	Ref. No.	Valid Form	Valid Till
Environmental Permit under EIAO	EP-337/2009	23 Apr 2009	N/A
	EP-445/2013	3 May 2013	N/A
	EP-445/2013/A	13 Aug 2014	N/A
Construction Dust Notification under APCO	445956	6 June 2019	N/A
Wastewater Discharge License under WPCO	WT00034610-2019	26 Sep 2019	30 Sep 2024
Waste Disposal Billing Account	7034450	28 June 2019	N/A
Registration as a Chemical Waste Producer	5218-286-P3182-03	18 Jul 2019	N/A
Construction Noise Permit	GW-RE1214-21	06 Dec 2021	01 Jun 2022
	GW-RE1262-21	30 Dec 2021	11 Jun 2022
	GW-RE1263-21	30 Dec 2021	17 Jun 2022
	GW-RE0206-22	20 Mar 2022	19 Sep 2022
	GW-RE0268-22	07 Apr 2022	30 Jun 2022
	GW-RE0309-22	14 Apr 2022	13 Oct 2022
	GW-RE0503-22	02 Jun 2022	01 Dec 2022
	GW-RE0539-22	11 Jun 2022	09 Dec 2022
GW-RE0580-22	18 Jun 2022	16 Dec 2022	

### **Implementation Status of Environmental Mitigation Measures**

6.7 The Contractor has implemented environmental mitigation measures and requires as stated in the EIA reports, the EP and the EM&A Manuals. The implementation status of the mitigation measures during the reporting month is summarized in Appendix O.

6.8 In response to the site audit findings, the Contractor carried out corrective actions with summary given in Appendix O.

**Environmental Complaint and Non-compliance**

6.9 No complaint was received in the reporting month. Summary of complaints in the reporting month is tabulated in Table 6.3.

*Table 6.3 Summary of complaints in the Reporting Month*

Date of complaint received	Date of complaint	Description of complaint	Investigation / Recommendations / Action take	Close-out date / Status
No complaint was received in the reporting month.	NA	NA	NA	NA

6.10 Complaint log and Complaint Investigation report are shown in Appendix P.

**Notifications of summons and successful prosecutions**

6.11 No notification of summons and successful prosecutions was received in the reporting month. Summary of summons and successful prosecutions in the reporting month is tabulated in Table 6.4.

*Table 6.4 Summary of summons and successful prosecutions in the Reporting Month*

Date of receiving notification of summons or prosecutions	Date of event	Description of event	Action take	Close-out date / Status
No notification of summons and successful prosecutions were received in the reporting	NA	NA	NA	NA

Date of receiving notification of summons or prosecutions	Date of event	Description of event	Action take	Close-out date / Status
month.				

6.12 The summaries of cumulative environmental complaint, warning, summon and notification of successful prosecution for the Project is presented in Appendix P.

## 7. FUTURE KEY ISSUES

### Construction Programme in the coming month

7.1 The major construction activities and potential impacts in the next reporting month as follow:

*Table 7.1 Summary of future key issues and potential impact in the coming month*

Future key issues in the coming month	Potential impact
North Approach Ramp – Construction of utilities trough	Noise and Air Quality, Chemical and Waste Management
Bridge D3 – Construction of Bridge Deck	Noise and Air Quality, Landscape and Visual
North Depressed Road – Construction of walls & top slab	Noise and Air Quality, Chemical and Waste Management
Underpass – Construction of walls and roof slab	Noise and Air Quality, Chemical and Waste Management
South Approach Ramp – Construction of Permanent Structure	Noise and Air Quality, Chemical and Waste Management
District Cooling System seawater intake box culvert – backfilling works, reinstatement of the seawall and backfilling works	Noise, Air and Water Quality
Lift 3 – Modification works	Noise and Air Quality, Chemical and Waste Management
Lift 4 – Construction of linking platform	Noise and Air Quality, Chemical and Waste Management
South Depressed Road –construction of permanent works	Noise and Air Quality, Chemical and Waste Management
Rising Main and Water Pipe – Laying of sewage	Noise, Air and Water Quality
Landscaped Deck – Construction of pile caps and installation of columns	Noise, Air and Water Quality
Transformer Room – Construction of permanent structure	Noise, Air and Water Quality
Shing Kai Road – Modification works, laying of storm water drainage pipes	Noise, Air and Water Quality
Lift 1 & 2 – Installation of ELS system	Noise and Air Quality, Chemical and Waste Management
CLP substation – Construction of wall & intermediate slab	Noise, Air and Water Quality
Noise Barrier – Remaining works, Bus lay-by construction	Noise, Air and Water Quality
Seawater Intake Box Culvert of Saltwater Pumping Station – Installation of sheetpiles and ELS system	Noise, Air and Water Quality

7.2 The mitigation measures for environmental impact including Air Quality, Construction Noise, Water Quality, Chemical and Waste Management, Landscape and Visual shall be implemented:

- Sufficient watering of the works site with the active dust emitting activities,
- Limitation of the speed for vehicles on unpaved site roads,
- Properly cover the stockpiles,
- Good maintenance to the plant and equipment,
- Use of quieter plant and Quality Powered Mechanical Equipment (QPME),
- Provide movable noise barriers,
- Appropriate desilting/ sedimentation devices provided on site for treatment before discharge,
- Well maintain the drainage system to prevent the spillage of wastewater during heavy rainfall,
- Onsite waste sorting and implementation of trip ticket system,
- Good management and control on construction waste reduction,
- Erection of decorative screen hoarding,
- Strictly following the Environmental Permits and Licenses, and
- Provide sufficient mitigation measures as recommended in Approved EIA Reports.

### **Environmental Site Inspection and Monitoring Schedule for next month**

7.3 The tentative schedule for weekly site inspection and air quality and noise monitoring in the next month is provided in Appendix C.

## **8. CONCLUSIONS**

- 8.1 Environmental monitoring works were performed in the reporting month and all monitoring results were checked and reviewed.
- 8.2 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.
- 8.3 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.
- 8.4 Construction noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.
- 8.5 No complaint was received in the reporting month.
- 8.6 No notification of summons and successful prosecutions was received in the reporting month.



**Figure**

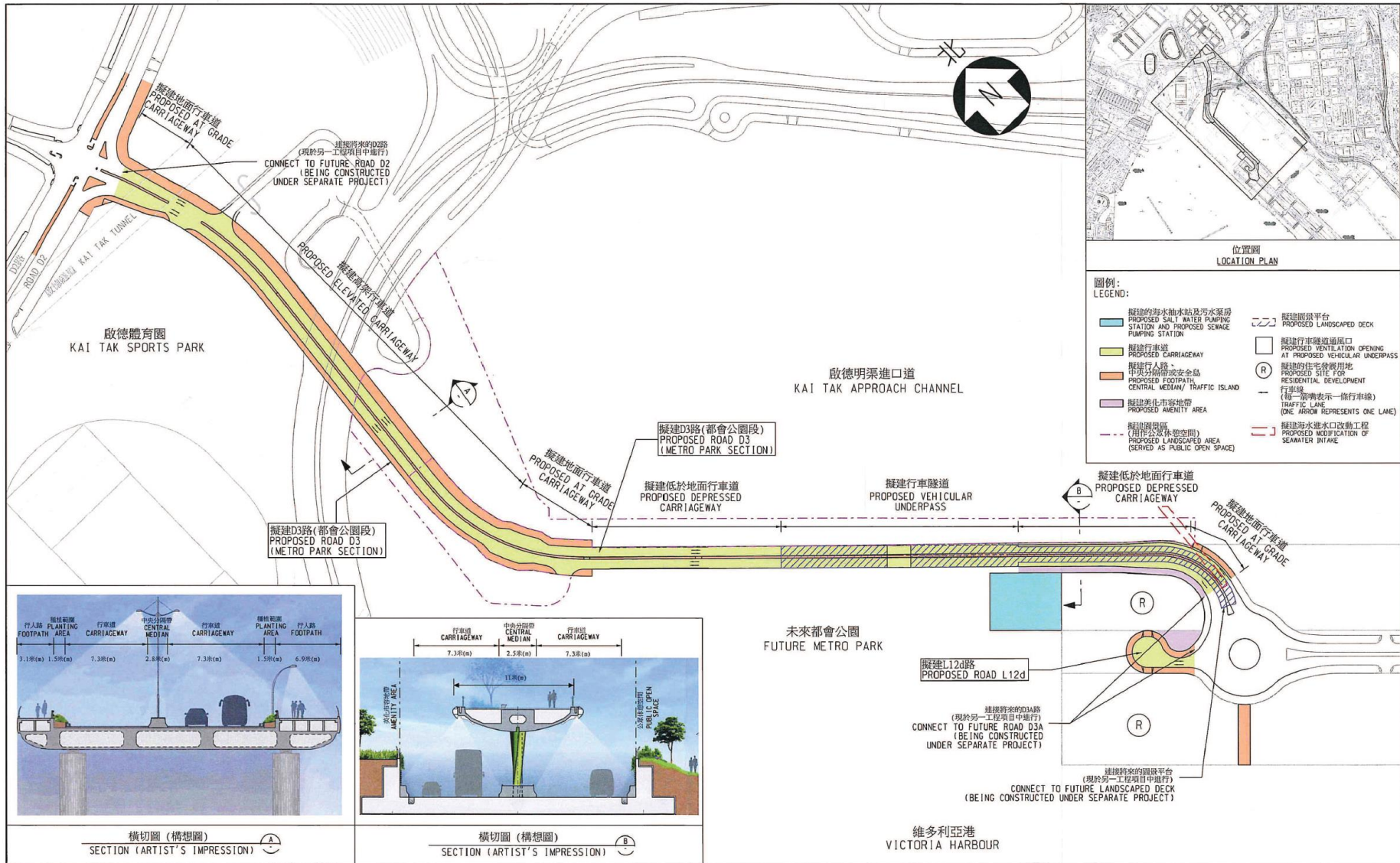


Figure 1 – Proposed works of Contract No. ED/2018/01

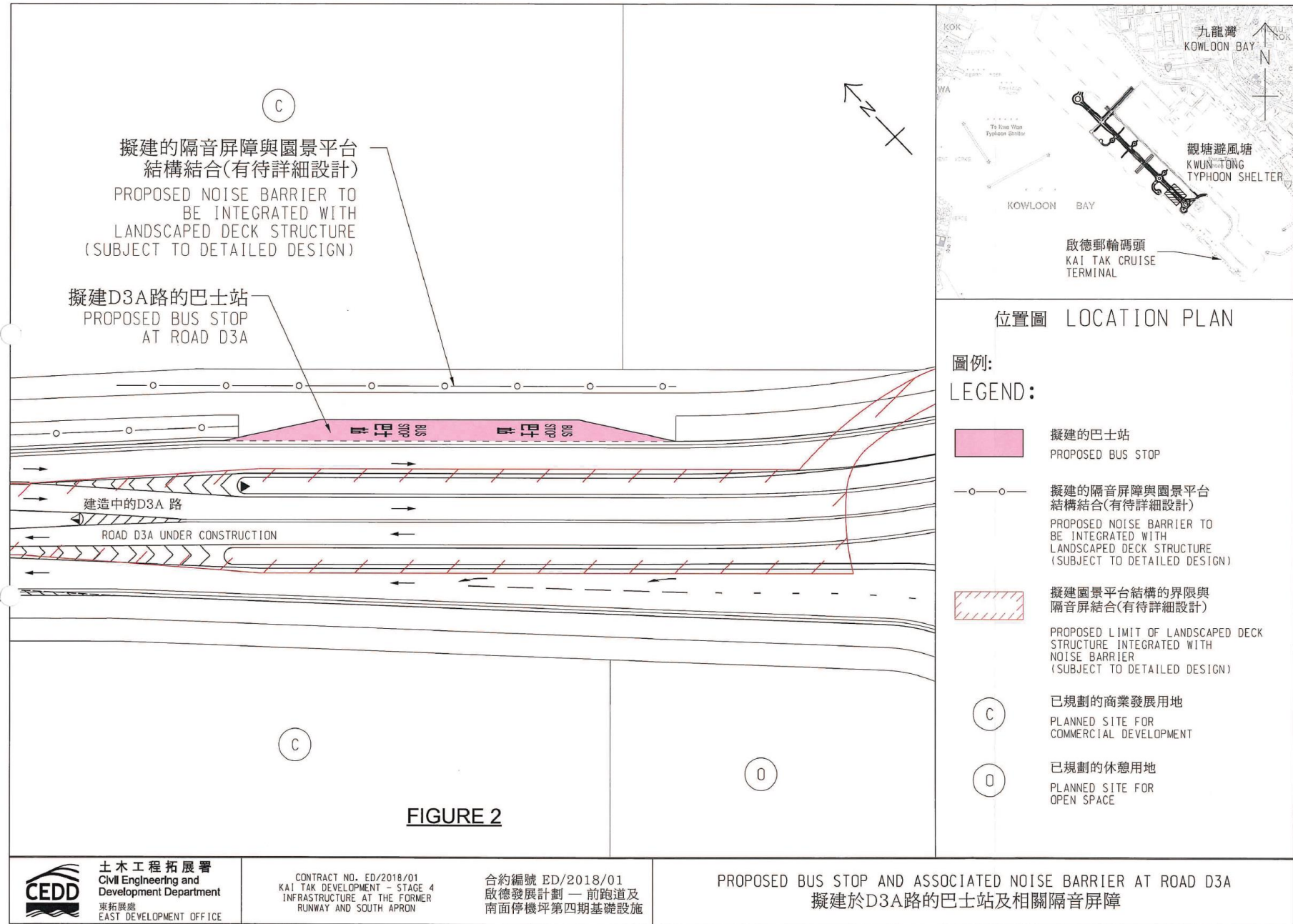


Figure 2 – Proposed Bus Stop And Associated Noise Barrier At Road D3A





Figure 3 – Future Pedestrian Connection Between Landscaped Deck And Private Developments

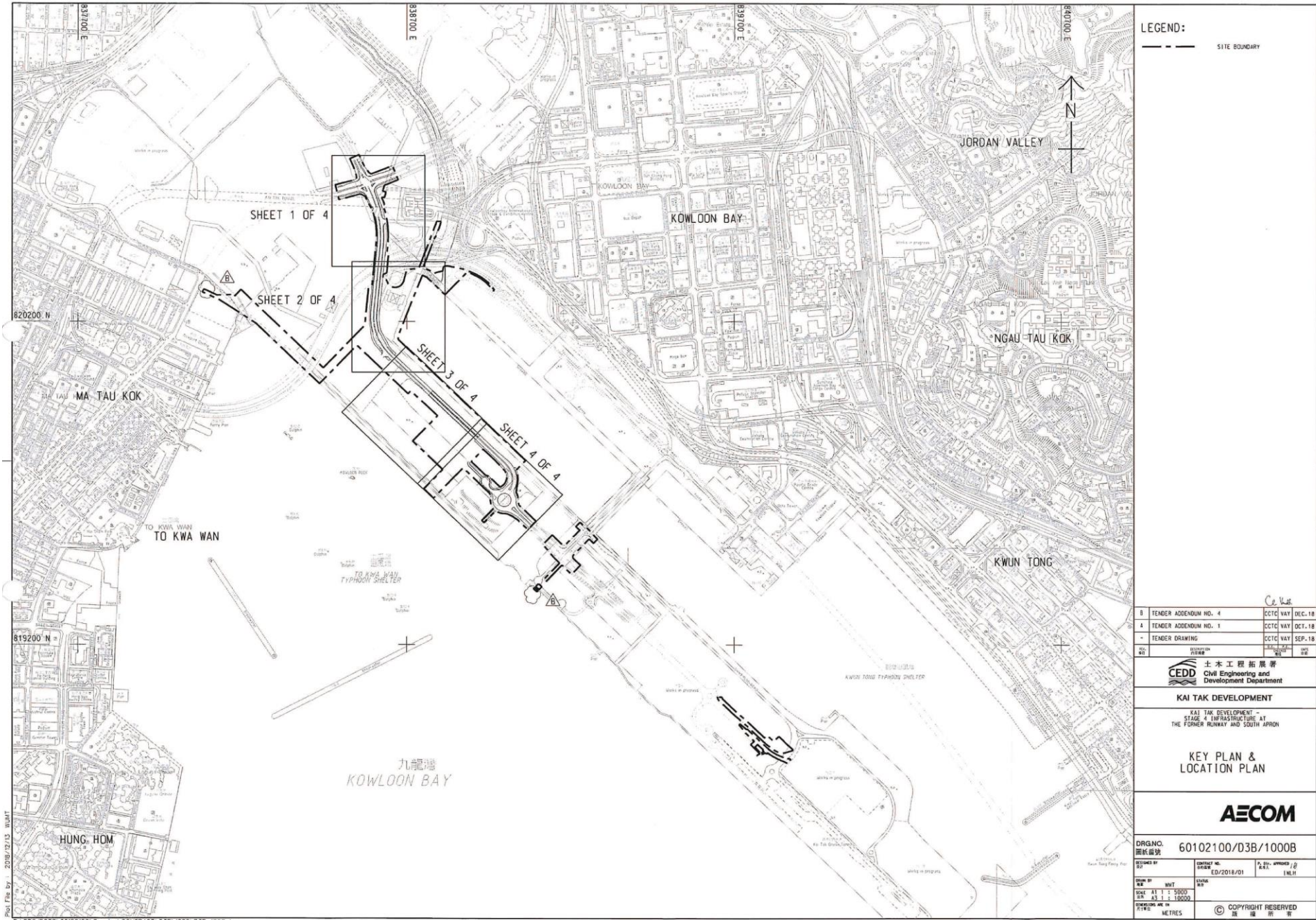


Figure 4 – Site Layout Plan



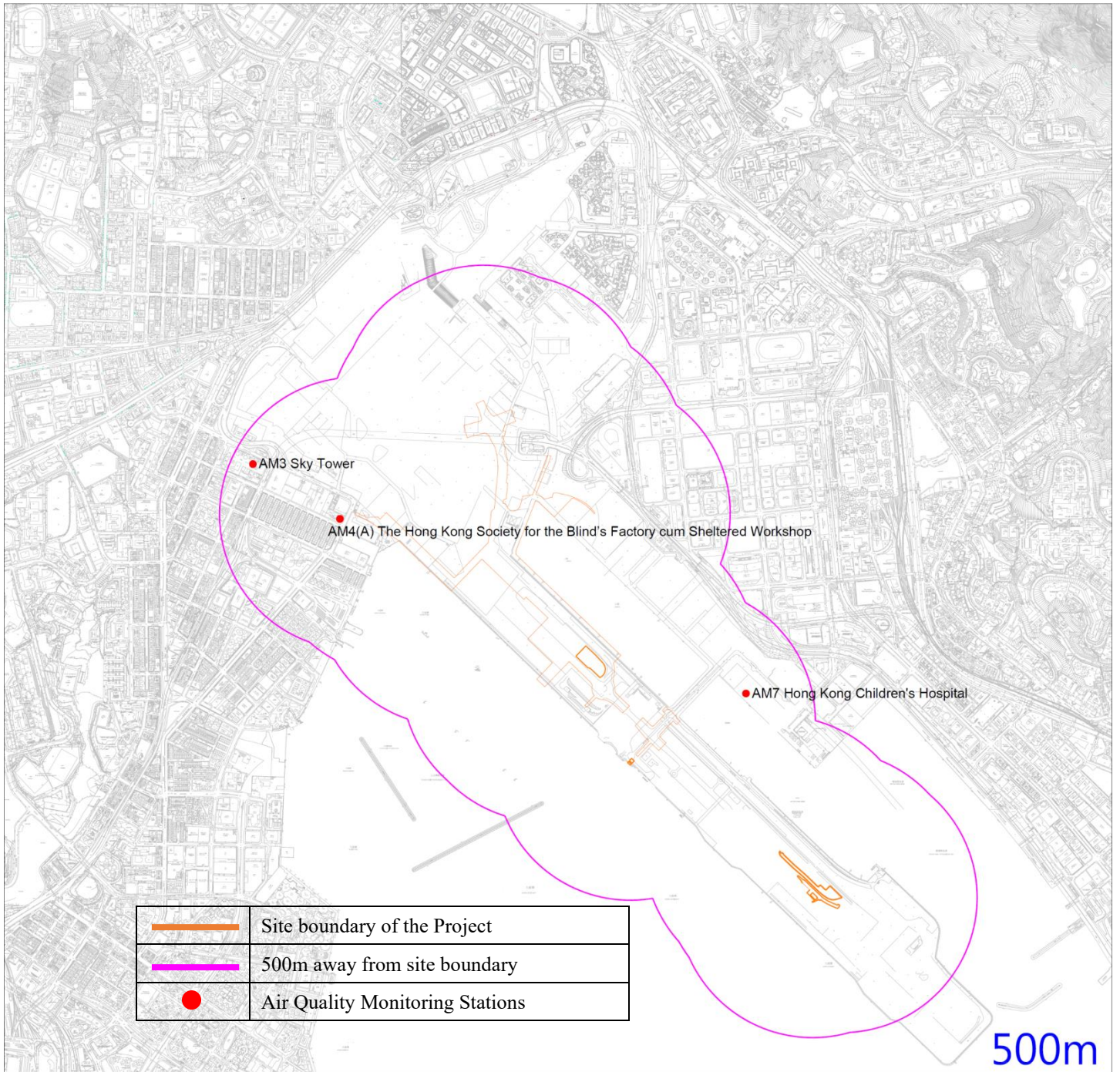


Figure 5 – Air Quality Monitoring Stations



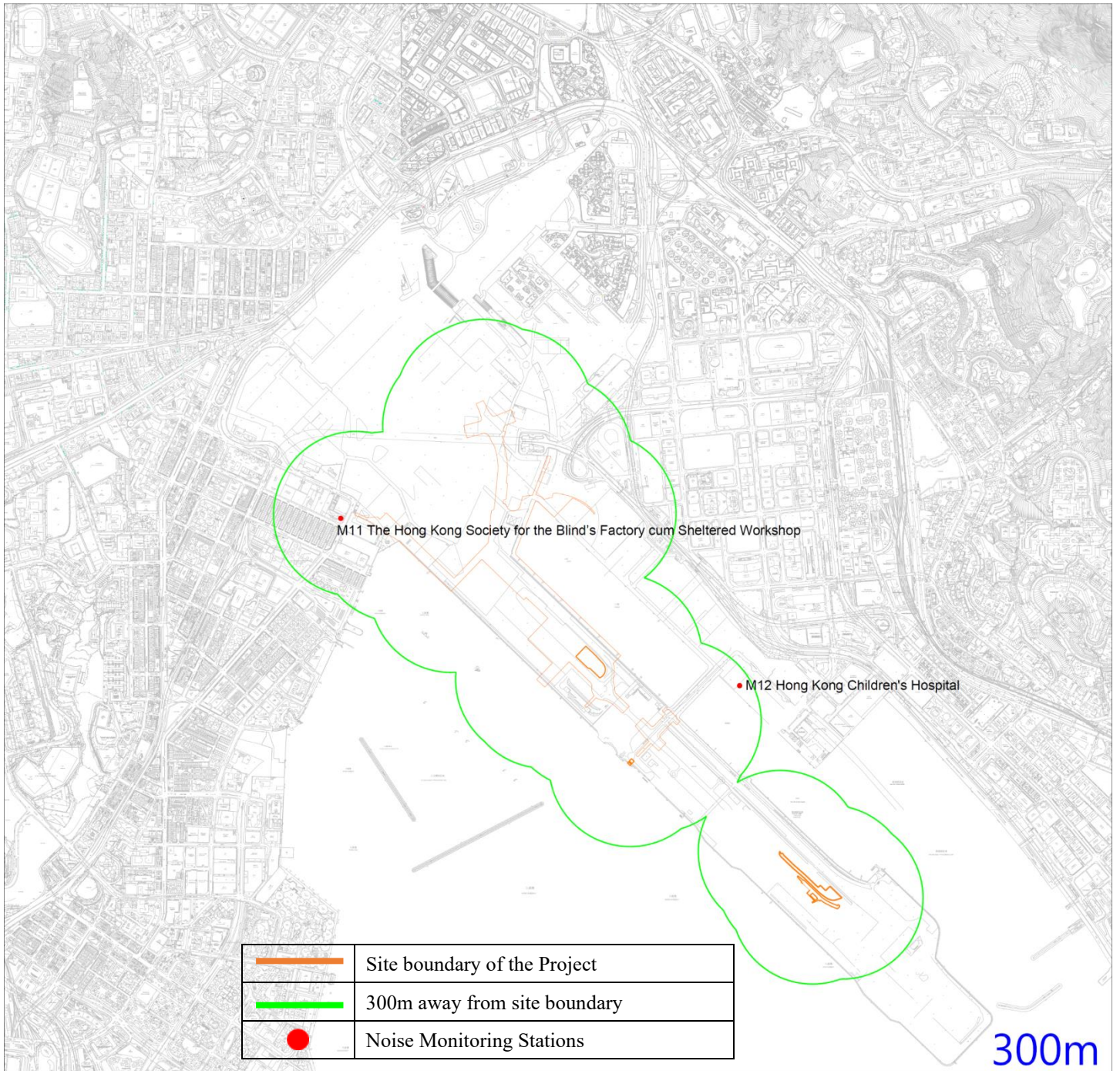
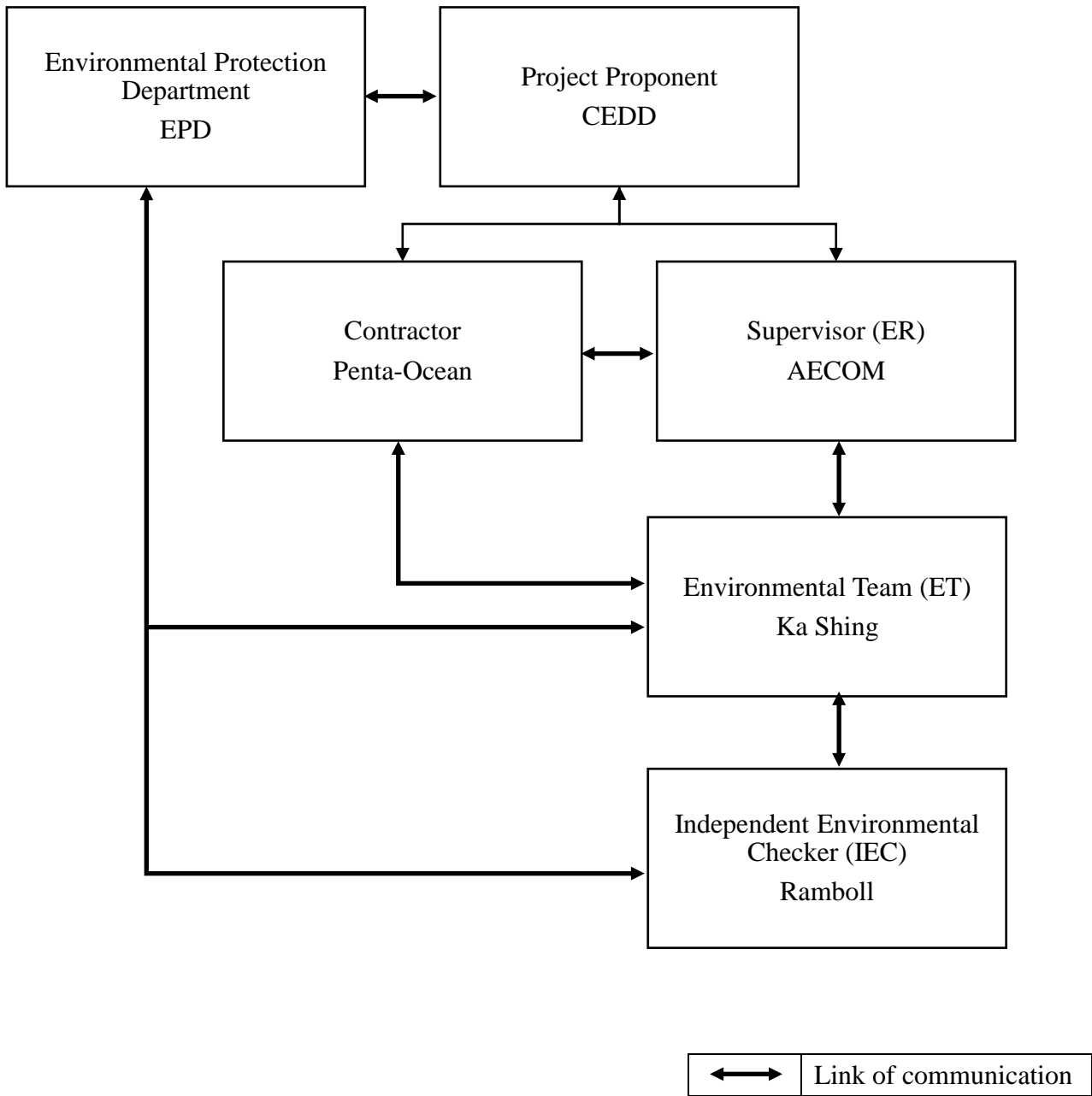


Figure 6 – Noise Monitoring Stations

**Appendix A – Organization Chart of EM&A Team**





# Appendix B – Construction Programme











































Contract No. ED/2018/01 KTD Project

ID	Task Name	Duration	Actual Duration	Remaining Duration	Physical % Complete	Early Start	Early Finish	Actual Start	Actual Finish	Late Start	Late Finish	Total Slack	TRA	Predecessors	2020				2021				2022				2023							
															Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1				
696	Section 6	0 days	0 days	0 days	0%	Thu 18/5/23	Thu 18/5/23	NA	NA	Tue 30/5/23	Tue 30/5/23	12 days	0 days	1357FF,1546FF																				
697	Section 7	0 days	0 days	0 days	0%	Wed 29/5/24	Wed 29/5/24	NA	NA	Wed 29/5/24	Wed 29/5/24	0 days	0 days	1549FF																				
698	Section 8	0 days	0 days	0 days	0%	Wed 24/11/21	Wed 24/11/21	NA	NA	Thu 2/12/21	Thu 2/12/21	8 days	0 days	1144FF																				
699	Section 9	0 days	0 days	0 days	0%	Sat 3/7/21	Sat 3/7/21	NA	NA	Mon 5/7/21	Mon 5/7/21	2 days	0 days	1222																				
700	Section 10	0 days	0 days	0 days	0%	Thu 11/5/23	Thu 11/5/23	NA	NA	Tue 30/5/23	Tue 30/5/23	19 days	0 days	1559FF																				
701	KD1	0 days	0 days	0 days	0%	Tue 11/8/20	Tue 11/8/20	NA	NA	Fri 7/8/20	Fri 7/8/20	-4 days	0 days	758																				
702	KD2	0 days	0 days	0 days	0%	Sat 17/4/21	Sat 17/4/21	NA	NA	Sun 18/4/21	Sun 18/4/21	1 day	0 days	791,821,771,774																				
703	KD3	0 days	0 days	0 days	0%	Mon 26/4/21	Mon 26/4/21	NA	NA	Tue 1/6/21	Tue 1/6/21	36 days	0 days	822,821																				
704	KD4	0 days	0 days	0 days	0%	Fri 28/1/22	Fri 28/1/22	NA	NA	Mon 31/1/22	Mon 31/1/22	3 days	0 days	1255FF																				
705	KD5	0 days	0 days	0 days	0%	Fri 25/6/21	Fri 25/6/21	NA	NA	Fri 17/9/21	Fri 17/9/21	84 days	0 days	1252FF																				
706	KD6	0 days	0 days	0 days	0%	Tue 21/12/21	Tue 21/12/21	NA	NA	Wed 29/12/21	Wed 29/12/21	8 days	0 days	883																				
707	KD7	0 days	0 days	0 days	0%	Thu 19/8/21	Thu 19/8/21	NA	NA	Fri 3/6/22	Fri 3/6/22	288 days	0 days	1254FF																				
708	Construction Works	1499 days	75.67 days	1423.33 days?	0%	Thu 16/5/19	Wed 29/5/24	Thu 16/5/19	NA	Thu 16/5/19	Wed 29/5/24	0 days?																						
709	Procurement of Materials and Equipments	615 days	12.7 days	602.3 days	0%	Thu 8/8/19	Wed 1/9/21	Thu 8/8/19	NA	Thu 8/8/19	Tue 22/2/22	140 days																						
710	Office Accommodation	21 days	21 days	0 days	100%	Thu 8/8/19	Fri 20/12/19	Thu 8/8/19	Fri 20/12/19	Thu 8/8/19	Fri 20/12/19	0 days	1 day																					
711	Lift Submission Preparation	15 days	0 days	15 days	0%	Sat 12/9/20	Sat 26/9/20	NA	NA	Wed 23/9/20	Wed 7/10/20	11 days	0.5 days	173																				
712	Lift Comment & Approval	21 days	0 days	21 days	0%	Sun 27/9/20	Sat 17/10/20	NA	NA	Thu 8/10/20	Wed 28/10/20	11 days	0.5 days	711																				
713	Lifts ((5 nos)	180 days	0 days	180 days	0%	Sun 18/10/20	Thu 15/4/21	NA	NA	Thu 29/10/20	Mon 26/4/21	11 days	30 days	712																				
714	Pumps for Pump Room next to Underpass	150 days	0 days	150 days	0%	Sat 23/5/20	Thu 19/11/20	NA	NA	Wed 8/7/20	Tue 5/1/21	37 days	30 days																					
715	Elevated landscape deck soffit panels	120 days	0 days	120 days	0%	Mon 14/9/20	Sat 6/2/21	NA	NA	Thu 4/2/21	Mon 5/7/21	117 days	30 days																					
716	Underpass & Depressed Rd - facades	120 days	0 days	120 days	0%	Tue 1/12/20	Thu 29/4/21	NA	NA	Wed 12/5/21	Mon 4/10/21	129 days	30 days																					
717	E & M equipment & fittings (for Open space & Promenade)	120 days	0 days	120 days	0%	Tue 6/4/21	Fri 27/8/21	NA	NA	Mon 27/9/21	Tue 22/2/22	144 days	30 days																					
718	Bridge Parapet Fabrication	120 days	0 days	120 days	0%	Mon 16/11/20	Mon 15/3/21	NA	NA	Wed 26/5/21	Wed 22/9/21	191 days	30 days																					
719	Pumps for Salt and Sewage Pumping Stations	150 days	0 days	150 days	0%	Mon 5/4/21	Wed 1/9/21	NA	NA	Sun 19/9/21	Tue 15/2/22	167 days	30 days																					
720	Excavation Permit	300 days	0 days	300 days	0%	Mon 31/8/20	Thu 2/9/21	NA	NA	Mon 23/11/20	Tue 1/3/22	69 days																						
721	TTA Application for Junction Modification Rd L6 & D2	182 days	0 days	182 days	0%	Tue 1/9/20	Mon 1/3/21	NA	NA	Mon 23/11/20	Sun 23/5/21	83 days	2 days																					
722	Interfaced DCS 3 x DN150mm chilled water pipes under contract no. 2852EM17A and 4 nos. of signaling cable along North Approach Ramp and Gate 3B (Agreed)	368 days	0 days	368 days	0%	Mon 31/8/20	Thu 2/9/21	NA	NA	Sat 27/2/21	Tue 1/3/22	180 days	3 day																					
723	Section 1	842 days	107.17 days	734.83 days	0%	Thu 16/5/19	Mon 14/3/22	Thu 16/5/19	NA	Thu 16/5/19	Wed 29/5/24	657 days																						
724	Agree Interface Coordination Plan with CKR & KTSP	14 days	14 days	0 days	100%	Tue 27/8/19	Wed 11/9/19	Tue 27/8/19	Wed 11/9/19	Tue 27/8/19	Wed 11/9/19	0 days	0 days	1225,1226																				
725	Ground Investigation	341 days	193.02 days	147.98 days	0%	Thu 12/9/19	Thu 5/11/20	Thu 12/9/19	NA	Thu 12/9/19	Sat 13/8/22	526 days																						
726	GI Work	318 days	180 days	138 days	57%	Thu 12/9/19	Thu 5/11/20	Thu 12/9/19	NA	Thu 12/9/19	Sat 13/8/22	526 days	0.5 days	724																				
727	Part 1 - Junction Modification Rd L6 & D2	414 days	0 days	414 days	0%	Mon 5/10/20	Fri 25/2/22	NA	NA	Mon 23/11/20	Tue 1/3/22	3 days																						
728	XP Application for Junction Modification Rd L6 & D2	182 days	0 days	182 days	0%	Mon 5/10/20	Sun 4/4/21	NA	NA	Mon 23/11/20	Sun 23/5/21	49 days	1 day																					
729	Stage 1: Trial Pit to locate the existing underground cables and utilities	14 days	0 days	14 days	0%	Thu 20/5/21	Fri 4/6/21	NA	NA	Mon 24/5/21	Tue 8/6/21	3 days	1 day	141,375,721,728																				
730	Stage 2: Trial Pit to locate the existing underground cables and utilities	14 days	0 days	14 days	0%	Sat 5/6/21	Tue 22/6/21	NA	NA	Wed 9/6/21	Fri 25/6/21	3 days	1 day	729																				
731	Stage 3: East Bound + Drop Kerb Modification + Road Marking	76 days	0 days	76 days	0%	Wed 23/6/21	Mon 20/9/21	NA	NA	Sat 26/6/21	Fri 24/9/21	3 days	1 day	730																				
732	Stage 4: TTA for Central Divider	76 days	0 days	76 days	0%	Tue 21/9/21	Tue 21/12/21	NA	NA	Sat 25/9/21	Fri 24/12/21	3 days	1 day	731,113																				
733	Stage 5: Construct 2 Dividers	51 days	0 days	51 days	0%	Wed 22/12/21	Fri 25/2/22	NA	NA	Tue 28/12/21	Tue 1/3/22	3 days	1 day	732																				
734	Bridge D3 (Approach Ramp and Bridge) CH1087-1444.7	812 days	91.74 days	720.26 days	0%	Thu 16/5/19	Mon 7/2/22	Thu 16/5/19	NA	Mon 11/11/19	Wed 29/5/24	687 days																						
735	North Approach Ramp	636 days	66.85 days	569.15 days	0%	Wed 25/12/19	Fri 18/2/22	Wed 25/12/19	NA	Wed 25/12/19	Tue 1/3/22	9 days																						
736	Procurement of Movement Joints for Bridge Works	180 days	0 days	180 days	0%	Tue 11/8/20	Sat 6/2/21	NA	NA	Fri 9/10/20	Tue 6/4/21	59 days	30 days	194,220																				
737	Sheetpile Driven along North, South & East Side ELS Cofferdam (assume 169 long)	4 days	4 days	0 days	100%	Tue 14/1/20	Fri 17/1/20	Tue 14/1/20	Fri 17/1/20	Tue 14/1/20	Fri 17/1/20	0 days	0.5 day																					
738	KTSP Completed Driven H-pile Installation	41 days	41 days	0 days	100%	Wed 25/12/19	Mon 3/2/20	Wed 25/12/19	Mon 3/2/20	Wed 25/12/19	Mon 3/2/20	0 days																						
739	Hoarding Removal along KTSP Site	5 days	5 days	0 days	100%	Tue 4/2/20	Sat 8/2/20	Tue 4/2/20	Sat 8/2/20	Tue 4/2/20	Sat 8/2/20	0 days	0.5 day	738																				

Title: Rev.11 Prog with Progress as of 22-May-20

Task		Summary		Inactive Milestone		Duration-only		Start-only		External Milestone		Critical Split	
Split		Project Summary		Inactive Summary		Manual Summary Rollup		Finish-only		Deadline		Progress	
Milestone		Inactive Task		Manual Task		Manual Summary		External Tasks		Critical		Manual Progress	

























Contract No. ED/2018/01 KTD Project

ID	Task Name	Duration	Actual Duration	Remaining Duration	Physical % Complete	Early Start	Early Finish	Actual Start	Actual Finish	Late Start	Late Finish	Total Slack	TRA	Predecessors	2020				2021				2022				2023			
															Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1138	Sheetpile Installation	25 days	0 days	25 days	0%	Fri 23/4/21	Mon 24/5/21	NA	NA	Mon 3/5/21	Tue 1/6/21	7 days	1 day	1137																
1139	Excavation with Shoring	52 days	0 days	52 days	0%	Tue 25/5/21	Mon 26/7/21	NA	NA	Wed 2/6/21	Tue 3/8/21	7 days	1 day	1138																
1140	Diversion of existing DCS box culvert	26 days	0 days	26 days	0%	Tue 27/7/21	Wed 25/8/21	NA	NA	Wed 4/8/21	Thu 2/9/21	7 days	2 days	1137,410,1139																
1141	Break up existing box culvert (4 walls) + top slab	35 days	0 days	35 days	0%	Thu 26/8/21	Thu 7/10/21	NA	NA	Fri 3/9/21	Sat 16/10/21	7 days	2 days	1140																
1142	Construct new walls at existing box culvert	20 days	0 days	20 days	0%	Fri 8/10/21	Mon 1/11/21	NA	NA	Mon 18/10/21	Tue 9/11/21	7 days	1 days	1141																
1143	Abandon existing DCS box culvert	20 days	0 days	20 days	0%	Tue 2/11/21	Wed 24/11/21	NA	NA	Wed 10/11/21	Thu 2/12/21	7 days	1 days	1142																
1144	Planned Completion for Section 8	0 days	0 days	0 days	0%	Wed 24/11/21	Wed 24/11/21	NA	NA	Thu 2/12/21	Thu 2/12/21	7 days	0 days	1143																
1145	Section 3	729 days	0 days	729 days	0%	Thu 16/5/19	Tue 26/10/21	NA	NA	Tue 2/6/20	Tue 2/11/21	6 days																		
1146	Part 2C - Lift LT3 & LT4	729 days	0 days	729 days	0%	Thu 16/5/19	Tue 26/10/21	NA	NA	Tue 2/6/20	Tue 2/11/21	6 days																		
1147	Access Date - Part 2A,2C	0 days	0 days	0 days	0%	Tue 2/6/20	Tue 2/6/20	NA	NA	Tue 2/6/20	Tue 2/6/20	0 days	0 days	4FS+369 days																
1148	Mobilization of plant and materials	15 days	0 days	15 days	0%	Thu 16/5/19	Sat 1/6/19	NA	NA	Sat 4/7/20	Tue 21/7/20	337 days	1 days																	
1149	TTA implementation	4 days	0 days	4 days	0%	Tue 2/6/20	Fri 5/6/20	NA	NA	Fri 17/7/20	Tue 21/7/20	37 days	1 day	1147																
1150	Carry out Titpit and Identify Underground Utilities location	12 days	0 days	12 days	0%	Mon 15/6/20	Fri 26/6/20	NA	NA	Mon 22/6/20	Fri 3/7/20	7 days																		
1151	Discuss with Relevant Utilities Undertakers	18 days	0 days	18 days	0%	Sat 27/6/20	Tue 14/7/20	NA	NA	Sat 4/7/20	Tue 21/7/20	7 days		1150																
1152	Slew CLP Cable and Abandon Telecom Cable (tentative)	75 days	0 days	75 days	0%	Wed 15/7/20	Mon 12/10/20	NA	NA	Wed 22/7/20	Mon 19/10/20	6 days	4 days	1148,1149,1151																
1153	Lift Tower Foundation - Temp. Works Design and Method Statement Submission	0 days	0 days	0 days	0%	Tue 4/8/20	Tue 4/8/20	NA	NA	Tue 15/9/20	Tue 15/9/20	42 days	1 day																	
1154	Lift Tower Foundation - Temp. Works Design and Method Statement Comment & Approval	35 days	0 days	35 days	0%	Tue 4/8/20	Mon 7/9/20	NA	NA	Tue 15/9/20	Mon 19/10/20	42 days	1 day	1153																
1155	Intall Sheetpile, ELS, Excavation and Temp. Works Installation (Shoring, Drainage & Slope Protection)	38 days	0 days	38 days	0%	Tue 13/10/20	Thu 26/11/20	NA	NA	Tue 20/10/20	Thu 3/12/20	6 days	2 days	1154,1152																
1156	Foundation Construction (Pad Footing include blinding layer, formwork erection, rebar fixing & concreting)	38 days	0 days	38 days	0%	Fri 27/11/20	Wed 13/1/21	NA	NA	Fri 4/12/20	Wed 20/1/21	6 days	2 days	1148,1152,175,1																
1157	Sheepile Extraction & Backfilling	13 days	0 days	13 days	0%	Thu 14/1/21	Thu 28/1/21	NA	NA	Thu 21/1/21	Thu 4/2/21	6 days	1 day	1156																
1158	Lift Tower - Temp. Works Design and Method Statement Submission	0 days	0 days	0 days	0%	Mon 2/11/20	Mon 2/11/20	NA	NA	Fri 1/1/21	Fri 1/1/21	60 days	1 day																	
1159	Lift Tower - Temp. Works Design and Method Statement Comment & Approval	35 days	0 days	35 days	0%	Mon 2/11/20	Sun 6/12/20	NA	NA	Fri 1/1/21	Thu 4/2/21	60 days	1 day	1158																
1160	Lift Shaft Tower: 3 Lifts x 20 day/Lift, Falsework & Formwork Erection, Rebar Fixing & Concreting	63 days	0 days	63 days	0%	Fri 29/1/21	Mon 19/4/21	NA	NA	Fri 5/2/21	Mon 26/4/21	6 days	3 days	1156,1159,1157																
1161	Lift installation (LT3 & LT4)	90 days	0 days	90 days	0%	Tue 20/4/21	Fri 6/8/21	NA	NA	Tue 27/4/21	Fri 13/8/21	6 days	5 days	1160,713																
1162	E & M installation	30 days	0 days	30 days	0%	Sat 7/8/21	Fri 10/9/21	NA	NA	Sat 14/8/21	Fri 17/9/21	6 days	3 days	1161																
1163	Louvers and Glazing Installation	26 days	0 days	26 days	0%	Fri 21/5/21	Mon 21/6/21	NA	NA	Sat 14/8/21	Mon 13/9/21	71 days	2 days	1160FS+25 days																
1164	Parapet Installation and Finishing Works	40 days	0 days	40 days	0%	Tue 22/6/21	Sat 7/8/21	NA	NA	Tue 14/9/21	Tue 2/11/21	71 days	4 days	1163																
1165	CLP Meter Installation	0 days	0 days	0 days	0%	Mon 1/2/21	Mon 1/2/21	NA	NA	Fri 20/8/21	Fri 20/8/21	200 days	0.5 day																	
1166	EMSD Submission Form 5 for Lift Inspection	0 days	0 days	0 days	0%	Mon 1/3/21	Mon 1/3/21	NA	NA	Fri 20/8/21	Fri 20/8/21	172 days	0.5 day	1165																
1167	EMSD Lift Inspection	0 days	0 days	0 days	0%	Sun 14/3/21	Sun 14/3/21	NA	NA	Fri 3/9/21	Fri 3/9/21	172 days	0.5 day	1166FS+14 days																
1168	Issuance of Lift Use Permit	0 days	0 days	0 days	0%	Mon 29/3/21	Mon 29/3/21	NA	NA	Sat 18/9/21	Sat 18/9/21	172 days	0.5 day	1167FS+15 days																
1169	Testing & commissioning with Statutory Inspection	36 days	0 days	36 days	0%	Sat 11/9/21	Tue 26/10/21	NA	NA	Sat 18/9/21	Tue 2/11/21	6 days	1 days	1162,1168																
1170	Footpath	28 days	0 days	28 days	0%	Tue 20/4/21	Mon 24/5/21	NA	NA	Tue 8/6/21	Mon 12/7/21	40 days	1 days	1160																
1171	Open Space within Part 2C	94 days	0 days	94 days	0%	Tue 25/5/21	Mon 13/9/21	NA	NA	Tue 13/7/21	Tue 2/11/21	40 days	4 days	1170,1230																
1172	Planned Completion for Section 3	0 days	0 days	0 days	0%	Tue 26/10/21	Tue 26/10/21	NA	NA	Tue 2/11/21	Tue 2/11/21	6 days	0 days	1171,1168,1169,																
1173	Sections 5 and 9: Noise Barrier Installation	380 days	6.83 days	373.17 days	0%	Fri 20/3/20	Sat 3/7/21	Fri 20/3/20	NA	Fri 20/3/20	Mon 5/7/21	1 day	1 day																	
1174	1.0 Noise Barrier Shop Drawing Preparation, Offsite Fabrication	141 days	20.86 days	120.14 days	0%	Mon 6/4/20	Thu 24/9/20	Mon 6/4/20	NA	Mon 6/4/20	Mon 7/12/20	60 days																		
1175	CNP and TTA available	0 days	0 days	0 days	0%	Wed 24/6/20	Wed 24/6/20	NA	NA	Thu 20/8/20	Thu 20/8/20	47 days	1 day																	
1176	Expose the Existing Noise Barrier Foundation	70 days	25 days	45 days	36%	Mon 6/4/20	Fri 3/7/20	Mon 6/4/20	NA	Mon 6/4/20	Tue 7/7/20	3 days	1 day																	
1177	Implement TTA	2 days	0 days	2 days	0%	Mon 13/7/20	Tue 14/7/20	NA	NA	Wed 18/11/20	Thu 19/11/20	107 days	0.5 day																	
1178	Expose the Existing Noise Barrier Foundation under Existing Footpath	15 days	0 days	15 days	0%	Wed 15/7/20	Fri 31/7/20	NA	NA	Fri 20/11/20	Mon 7/12/20	107 days	1 day	1177																
1179	Carry out the Site Survey for Existing Holding Down Bolt at Existing Landscaped Deck	6 days	0 days	6 days	0%	Wed 24/6/20	Thu 2/7/20	NA	NA	Thu 20/8/20	Wed 26/8/20	47 days	1 day	1175																
1180	Noise Barrier Shop Drawings Preparation	30 days	0 days	30 days	0%	Fri 31/7/20	Thu 3/9/20	NA	NA	Fri 21/8/20	Thu 24/9/20	18 days	0.5 day	1176FF+18 days																
1181	Noise Barrier Shop Drawings Comment by PM	18 days	0 days	18 days	0%	Fri 4/9/20	Thu 24/9/20	NA	NA	Fri 25/9/20	Sat 17/10/20	18 days	0.5 day	1180																
1182	PMAA Panel Material Sample Submission	0 days	0 days	0 days	0%	Sat 2/5/20	Sat 2/5/20	NA	NA	Sat 6/6/20	Sat 6/6/20	30 days	1 days																	

Title: Rev.11 Prog with Progress as of 22-May-20

Task		Summary		Inactive Milestone		Duration-only		Start-only		External Milestone		Critical Split	
Split		Project Summary		Inactive Summary		Manual Summary Rollup		Finish-only		Deadline		Progress	
Milestone		Inactive Task		Manual Task		Manual Summary		External Tasks		Critical		Manual Progress	







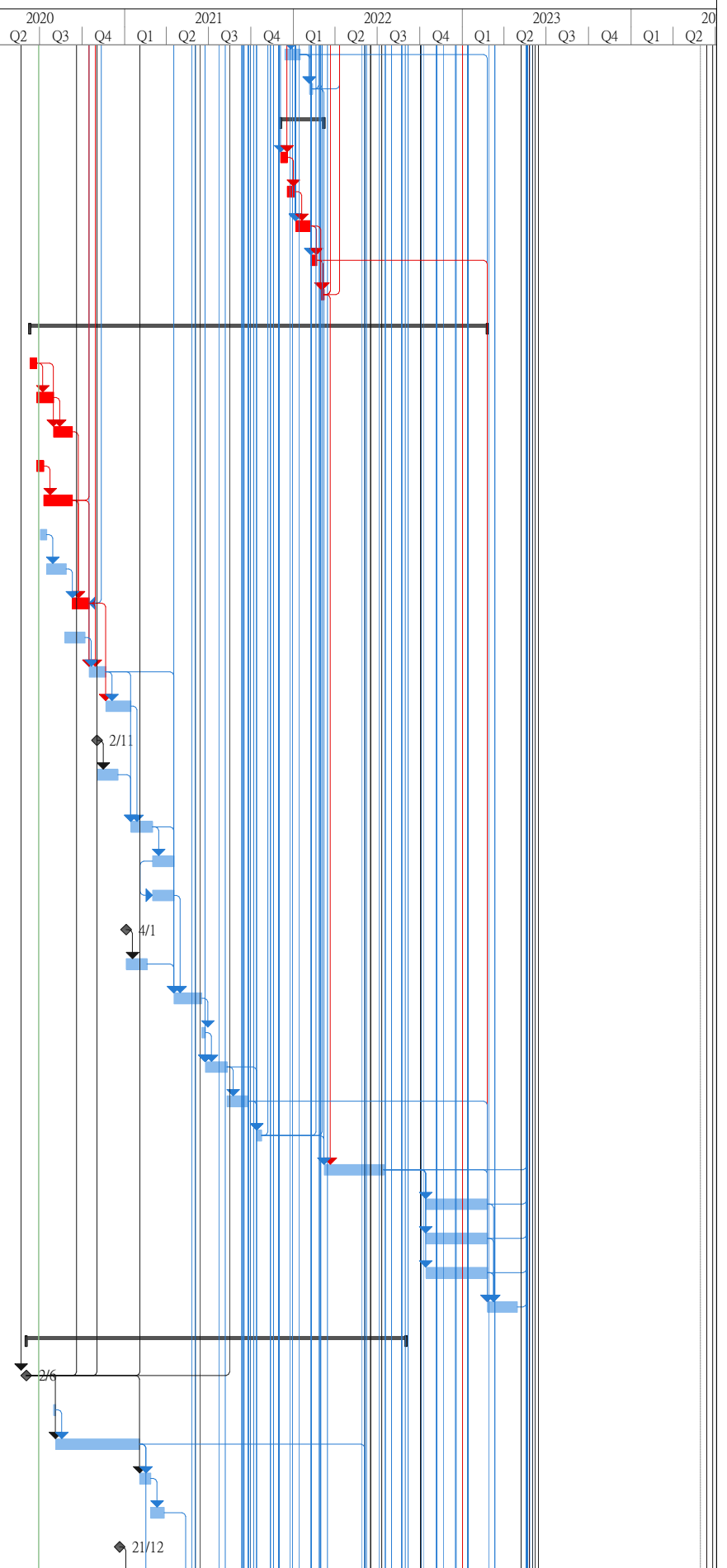






Contract No. ED/2018/01 KTD Project

ID	Task Name	Duration	Actual Duration	Remaining Duration	Physical % Complete	Early Start	Early Finish	Actual Start	Actual Finish	Late Start	Late Finish	Total Slack	TRA	Predecessors	2020				2021				2022				2023			
															Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1407	Secondary Upstand Beam	26 days	0 days	26 days	0%	Mon 13/12/21	Fri 14/1/22	NA	NA	Thu 16/12/21	Tue 18/1/22	3 days	1.5 day	1406																
1408	Dismantle falsework	6 days	0 days	6 days	0%	Fri 4/2/22	Thu 10/2/22	NA	NA	Tue 8/2/22	Mon 14/2/22	3 days	0.5 day	1406FS+14 days																
1409	Part 2A - CH2020-2050 (30m) 3 bays	74 days	0 days	74 days	0%	Sat 4/12/21	Mon 7/3/22	NA	NA	Mon 22/11/21	Tue 22/2/22	-11 days																		
1410	Pier (3sets x 3nos) within CH2007-2090. 1 team	12 days	0 days	12 days	0%	Sat 4/12/21	Fri 17/12/21	NA	NA	Mon 22/11/21	Sat 4/12/21	-11 days	3 day	579,1087																
1411	Falsework erection	12 days	0 days	12 days	0%	Sat 18/12/21	Tue 4/1/22	NA	NA	Mon 6/12/21	Sat 18/12/21	-11 days	3 days	1410																
1412	Deck (3 bays) 12d/bay	25 days	0 days	25 days	0%	Wed 5/1/22	Sat 5/2/22	NA	NA	Mon 20/12/21	Thu 20/1/22	-11 days	3 day	1411,1406,625,6																
1413	Secondary Upstand Beam	12 days	0 days	12 days	0%	Mon 7/2/22	Sat 19/2/22	NA	NA	Fri 21/1/22	Mon 7/2/22	-11 days	1.5 day	1412,1406,1407																
1414	Dismantle falsework	6 days	0 days	6 days	0%	Tue 1/3/22	Mon 7/3/22	NA	NA	Wed 16/2/22	Tue 22/2/22	-11 days	0.5 day	1412,1413FS+7																
1415	Elevated Landscaped Deck CH2090 - Ch2109	989 days	0 days	989 days	0%	Wed 10/6/20	Thu 23/2/23	NA	NA	Wed 10/6/20	Thu 23/3/23	0 days																		
1416	G.I. Works/Predrilling Works for Bored Pile No. LD-BP03	12 days	0 days	12 days	0%	Wed 10/6/20	Tue 23/6/20	NA	NA	Wed 10/6/20	Tue 23/6/20	0 days	1 day																	
1417	Design Verification for Bored Pile No. LD-BP02	30 days	0 days	30 days	0%	Wed 24/6/20	Thu 30/7/20	NA	NA	Wed 24/6/20	Thu 30/7/20	0 days	1 day	1416																
1418	CH2090: Bored Pile No. LD-BP02	34 days	0 days	34 days	0%	Fri 31/7/20	Tue 8/9/20	NA	NA	Fri 31/7/20	Tue 8/9/20	0 days	1 day	1416,1417																
1419	Triplet	12 days	0 days	12 days	0%	Wed 24/6/20	Thu 9/7/20	NA	NA	Wed 24/6/20	Thu 9/7/20	0 days	1 day																	
1420	Diversion of existing watermain and CLP cable (Tentative)	52 days	0 days	52 days	0%	Fri 10/7/20	Tue 8/9/20	NA	NA	Fri 10/7/20	Tue 8/9/20	0 days	15 day	1419																
1421	G.I. Works/Predrilling Works for Bored Pile No. LD-BP03	12 days	0 days	12 days	0%	Thu 2/7/20	Wed 15/7/20	NA	NA	Wed 15/7/20	Tue 28/7/20	11 days	1 day																	
1422	Design Verification for Bored Pile No. LD-BP03	36 days	0 days	36 days	0%	Thu 16/7/20	Wed 26/8/20	NA	NA	Wed 29/7/20	Tue 8/9/20	11 days	1 day	1421																
1423	CH2069: Bored Pile No. LD-BP03	30 days	0 days	30 days	0%	Wed 9/9/20	Thu 15/10/20	NA	NA	Wed 9/9/20	Thu 15/10/20	0 days	1 day	1418,314FF,142																
1424	Design Verification for Bored Pile No. LD-BP01	36 days	0 days	36 days	0%	Mon 24/8/20	Tue 6/10/20	NA	NA	Sat 12/9/20	Tue 27/10/20	17 days	1 day																	
1425	CH2109: Bored Pile No. LD-BP01	30 days	0 days	30 days	0%	Fri 16/10/20	Fri 20/11/20	NA	NA	Wed 28/10/20	Tue 1/12/20	9 days	1 day	1423,314,1420,1																
1426	Pile testing	43 days	0 days	43 days	0%	Sat 21/11/20	Wed 13/1/21	NA	NA	Wed 2/12/20	Sat 23/1/21	9 days	1 day	1423,1425																
1427	Elevated Landscape Deck - Pilecap with ELS Temp. Works Design and Method Statement Submission	0 days	0 days	0 days	0%	Mon 2/11/20	Mon 2/11/20	NA	NA	Fri 11/12/20	Fri 11/12/20	39 days	1.5 day																	
1428	Elevated Landscape Deck - Pilecap with ELS Temp. Works Design and Method Statement Comment & Approval	45 days	0 days	45 days	0%	Mon 2/11/20	Wed 16/12/20	NA	NA	Fri 11/12/20	Sun 24/1/21	39 days	1.5 day	1427																
1429	CH2090: Pilecap with ELS	37 days	0 days	37 days	0%	Thu 14/1/21	Mon 1/3/21	NA	NA	Mon 25/1/21	Thu 11/3/21	9 days	1 day	1425,1426,1428																
1430	CH2069: Pilecap with ELS	37 days	0 days	37 days	0%	Tue 2/3/21	Fri 16/4/21	NA	NA	Fri 12/3/21	Tue 27/4/21	9 days	1 day	1429																
1431	CH2109: Pilecap with ELS	37 days	0 days	37 days	0%	Tue 2/3/21	Fri 16/4/21	NA	NA	Fri 12/3/21	Tue 27/4/21	9 days	1 day	1430SS																
1432	Elevated Landscape Deck - Temp. Works Design and Method Statement Submission	0 days	0 days	0 days	0%	Mon 4/1/21	Mon 4/1/21	NA	NA	Sun 14/3/21	Sun 14/3/21	69 days	0.5 day																	
1433	Elevated Landscape Deck - Temp. Works Design and Method Statement Comment & Approval	45 days	0 days	45 days	0%	Mon 4/1/21	Wed 17/2/21	NA	NA	Sun 14/3/21	Tue 27/4/21	69 days	0.5 day	1432																
1434	Pier (3sets x 3nos) within CH2060-2119. 1 team, 1 no./day	48 days	0 days	48 days	0%	Sat 17/4/21	Tue 15/6/21	NA	NA	Wed 28/4/21	Fri 25/6/21	9 days	3 day	1433,579,1425,1																
1435	Falsework erection	7 days	0 days	7 days	0%	Wed 16/6/21	Wed 23/6/21	NA	NA	Sat 26/6/21	Mon 5/7/21	9 days	0 days	1434																
1436	Deck (3 bays) 12d/bay	39 days	0 days	39 days	0%	Thu 24/6/21	Mon 9/8/21	NA	NA	Tue 6/7/21	Thu 19/8/21	9 days	3 day	1435,715,625,62																
1437	Secondary Upstand Beam	39 days	0 days	39 days	0%	Tue 10/8/21	Fri 24/9/21	NA	NA	Fri 20/8/21	Wed 6/10/21	9 days	1.5 day	1436																
1438	Dismantle falsework	9 days	0 days	9 days	0%	Wed 13/10/21	Sat 23/10/21	NA	NA	Mon 25/10/21	Wed 3/11/21	9 days	1 day	1436FS+14 days																
1439	Install External Cladding	105 days	0 days	105 days	0%	Tue 8/3/22	Thu 14/7/22	NA	NA	Wed 6/4/22	Thu 11/8/22	24 days	5 days	1438,1408,1414																
1440	Elevated Landscaped Deck: Hard Landscaping Works	110 days	0 days	110 days	0%	Fri 14/10/22	Thu 23/2/23	NA	NA	Fri 11/11/22	Thu 23/3/23	24 days	2 days	1439FS+75 days																
1441	Elevated Landscaped Deck: Soft Landscaping Works	110 days	0 days	110 days	0%	Fri 14/10/22	Thu 23/2/23	NA	NA	Fri 11/11/22	Thu 23/3/23	24 days	2 days	1439FS+75 days																
1442	Elevated Landscaped Deck: Planting Works	110 days	0 days	110 days	0%	Fri 14/10/22	Thu 23/2/23	NA	NA	Fri 11/11/22	Thu 23/3/23	24 days	2 days	1439FS+75 days																
1443	Installation of Glass Balustrade	52 days	0 days	52 days	0%	Fri 24/2/23	Sat 29/4/23	NA	NA	Fri 24/3/23	Tue 30/5/23	24 days	6 days	1437,1407,1413,																
1444	Part 2A - Lift LT1 & LT2 (Landscaped Deck)	671 days	0 days	671 days	0%	Tue 2/6/20	Wed 31/8/22	NA	NA	Tue 2/6/20	Tue 30/5/23	0 days																		
1445	Access Date - Part 2A,2C	0 days	0 days	0 days	0%	Tue 2/6/20	Tue 2/6/20	NA	NA	Tue 2/6/20	Tue 2/6/20	0 days	0 days	4FS+369 days																
1446	TTA Implementation	3 days	0 days	3 days	0%	Fri 31/7/20	Mon 3/8/20	NA	NA	Wed 9/6/21	Fri 11/6/21	254 days																		
1447	Utilities Diversion (Towngas and Telecom Cable) (tentative)	150 days	0 days	150 days	0%	Tue 4/8/20	Mon 1/2/21	NA	NA	Sat 12/6/21	Thu 9/12/21	254 days	5 days	1445,1446																
1448	G.I. works	18 days	0 days	18 days	0%	Tue 2/2/21	Thu 25/2/21	NA	NA	Fri 10/12/21	Mon 3/1/22	254 days	1 day	1445,1447																
1449	Design Verification	25 days	0 days	25 days	0%	Fri 26/2/21	Fri 26/3/21	NA	NA	Tue 4/1/22	Fri 4/2/22	254 days	2 days	1448																
1450	Lift Pilecap & ELS- Temp. Works Design and Method Statement Submission	0 days	0 days	0 days	0%	Mon 21/12/20	Mon 21/12/20	NA	NA	Tue 16/11/21	Tue 16/11/21	330 days	0.5 day																	



Title: Rev.11 Prog with Progress as of 22-May-20

Task		Summary		Inactive Milestone		Duration-only		Start-only		External Milestone		Critical Split	
Split		Project Summary		Inactive Summary		Manual Summary Rollup		Finish-only		Deadline		Progress	
Milestone		Inactive Task		Manual Task		Manual Summary		External Tasks		Critical		Manual Progress	









# **Appendix C – Environmental monitoring schedules**

Contract No. EDO 15/2018 Environmental Monitoring at Kai Tak Development Stage 4 Infrastructure at the former runway and south apron  
Environmental Monitoring and Weekly Site Inspection Schedule for June 2022

June 2022

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2 Weekly Site Inspection	3	4 24-hr TSP: AM3, AM4(A), AM7 1-hr X3 TSP: AM3, AM4(A), AM7
5	6	7	8 Weekly Site Inspection + SSMC meeting	9	10 24-hr TSP: AM3, AM4(A), AM7 1-hr X3 TSP: AM3, AM4(A), AM7 30-min Noise: M11, M12	11
12	13	14	15	16 Weekly Site Inspection 24-hr TSP: AM3, AM4(A), AM7 1-hr X3 TSP: AM3, AM4(A), AM7 30-min Noise: M11, M12	17	18
19	20	21	22 24-hr TSP: AM3, AM4(A), AM7 1-hr X3 TSP: AM3, AM4(A), AM7 30-min Noise: M11, M12	23 Weekly Site Inspection	24	25
26	27	28 24-hr TSP: AM3, AM4(A), AM7 1-hr X3 TSP: AM3, AM4(A), AM7 30-min Noise: M11, M12	29	30 Weekly Site Inspection		

**Air Quality Monitoring Station**

AM3 - Sky Tower  
AM4(A) - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop  
AM7 - Hong Kong Children's Hospital

**Noise Quality Monitoring Station**

M11 - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop  
M12 - Hong Kong Children's Hospital



Contract No. EDO 15/2018 Environmental Monitoring at Kai Tak Development Stage 4 Infrastructure at the former runway and south apron  
Tentative Environmental Monitoring and Weekly Site Inspection Schedule for July 2022

July 2022

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4 24-hr TSP: AM3, AM4(A), AM7 1-hr X3 TSP: AM3, AM4(A), AM7 30-min Noise: M11, M12	5	6	7 Weekly Site Inspection	8	9 24-hr TSP: AM3, AM4(A), AM7 1-hr X3 TSP: AM3, AM4(A), AM7
10	11	12 Weekly Site Inspection+ SSMC meeting	13	14	15 24-hr TSP: AM3, AM4(A), AM7 1-hr X3 TSP: AM3, AM4(A), AM7 30-min Noise: M11, M12	16
17	18	19	20	21 Weekly Site Inspection 24-hr TSP: AM3, AM4(A), AM7 1-hr X3 TSP: AM3, AM4(A), AM7 30-min Noise: M11, M12	22	23
24	25	26	27 24-hr TSP: AM3, AM4(A), AM7 1-hr X3 TSP: AM3, AM4(A), AM7 30-min Noise: M11, M12	28 Weekly Site Inspection	29	30
31						

NOTE:

- 1) Site inspection schedule and Impact monitoring schedule may be changed due to unforeseen circumstance (e.g. adverse weather).

**Air Quality Monitoring Station**

AM3 - Sky Tower

AM4(A) - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop

AM7 - Hong Kong Children's Hospital

**Noise Quality Monitoring Station**

M11 - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop

M12 - Hong Kong Children's Hospital

**Appendix D – Photographic records**

Impact Air Quality Monitoring



Measurement setup at AM3



Measurement setup at AM4(A)

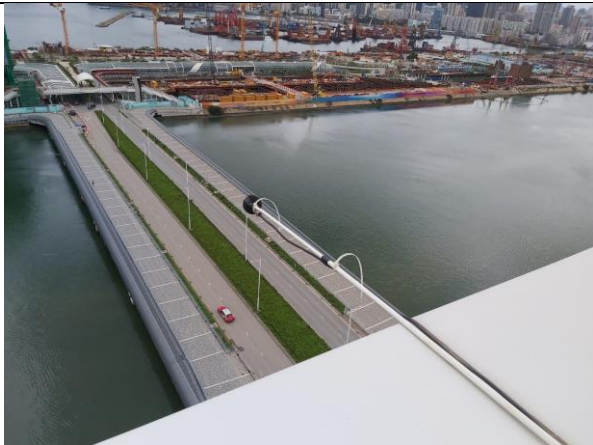


Measurement setup at AM7

Impact Noise Monitoring



Measurement setup at M11



Measurement setup at M12



Weather Station at the rooftop of Hong Kong Children's Hospital

**Appendix E – Calibration certificates, catalogue of air quality  
monitoring equipment**



## Catalogue of High Volume Sampler (HVS)



### TSP MFC

Total Suspended Particulate, Mass Flow Controlled



**MFC TSP**  
Ambient Air Sampler

The TE-5170 is a high volume ambient Total Suspended Particulate (TSP) air sampler featuring a mass flow controller (MFC) for accurate and consistent particulate sampling. The mass flow controller adjust the motor speed as the filter media collects particulate to maintain a constant flow rate throughout the entire sample duration. The system utilizes a stainless steel filter holder for use with standard 8" x 10" filter paper. The anodized aluminum shelter and robust electrical components allow the system to operate a continuous 24 hour sample.

**ABOUT US:** Tisch Environmental Inc. Tisch Environmental is the benchmark for high volume air sampling, particulate, metals, volatiles, and specialty monitoring equipment. Since the company's inception in 1953 as General Metal Works, our product line has expanded from the first high volume air sampler to include high-tech and custom samplers. Our clients are professionals from every sector of the regulatory and industrial markets.

- ✔ Meets EPA CFR, Appendix B to Part 50
- ✔ Total Suspended Particulate(TSP)
- ✔ Mass Flow Controlled
- ✔ 7-Day Mechanical Timer
- ✔ Elapsed Time Indicator
- ✔ Aluminum Outdoor Shelter
- ✔ Brush Style Motor
- ✔ Dickson Chart Recorder, 24 Hour
- ✔ Stainless Steel Filter Holder
- ✔ 36-60 CFM
- ✔ Made In USA

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## TSP MFC

MFC TSP Ambient Air Sampler

### General System Specifications

**Particulate Size:**Total Suspended Particulate (TSP)  
**EPA Designation:** CFR 40 Part 50 Appendix B  
**Flow Controller:** Mass Flow Controller  
**Motor Style:**Brush Style Motor Assembly  
**Pressure Recorder:**Dickson Chart Recorder, 24 hour  
**Timer:**7 Day Mechanical  
**Elapsed Time Indicator:**Mechanical, Hours and Tenths  
**Flow Range:**39-60CFM, 1.09M<sup>3</sup>M-1.68M<sup>3</sup>M  
**Housing:**Anodized Aluminum  
**Filter Holder:**Stainless Steel, 8" x 10"  
**4" Recorder Charts:** Box of 100  
**Filter Holder:** 8" x 10" Stainless Steel with hold down frame

### Applications

US EPA Reference Method Sampling, CFR Appendix J Part 50 Regulatory Compliance  
 Institutional Studies  
 Construction Sites  
 Bridge and Water Tower Painting Sites  
 Fence Line Monitoring  
 Industrial Monitoring  
 Landfill Monitoring  
 Public Health Applications

### Optional Equipment

TE-3000 Filter Holder Cartridge  
 TE-G653 8" x 10" Glass Fiber Filter Media  
 TE-33384 Motor Brush Set (110volt)  
 TE-33378 Motor Brush Set (220volt)  
 TE-116311 Replacement Motor (110volt)  
 TE-116312 Replacement Motor (220volt)  
 TE-106 Recorder Charts  
 TE-160 Recorder Pen Points  
 TE-5018 Gasket 8" x 10"

### Available Models

TE-5170 TSP MFC, 110 Volt 60 Hertz, 8 Amps  
 TE-5170X TSP MFC, 220 Volt 50 Hertz 4 Amps  
 TE-5170XZ TSP MFC, 220 Volts 60 Hertz, 4 Amps

### Calibration Equipment

TE-5028 -Variable Flow Calibration Kit  
 TE-HVC-V Xcalibrator HiVol Calibrator

### Physical Specifications

**Weight:** 75lbs, Shelter  
**Shipping Dimensions:** 46"W x 23"L x 20" H, Shelter  
 19"W x 19"L x 20"H, Lid  
**Assembled Dimensions:** 28"W x 28"L x 61"H

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## Calibration Certificate of HVS

### Air Sampler Calibration Curve Plotting & Calculation (Dickson recorder)

Calibration curve ref. No. : ATSPC-01-2022050401 Date of calibration : 04/05/2022

Location : Sky Tower Sampler : TE-5170X

**Calibration Data**

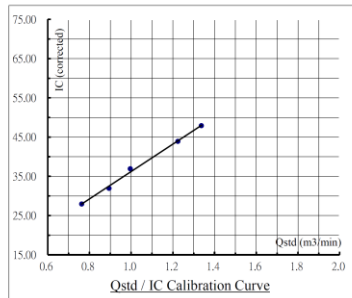
Ambient barometric pressure, Pa = 760.6 ( mmHg ) Ambient temperature, Ta = 299.45 ( deg K )  
Qstd Slope, m = 2.03518 Qstd Intercept, b = -0.005890

**Calibration Curve**

Plate No.	H <sub>2</sub> O ( in )	Qstd ( m <sup>3</sup> / min )	I ( chart )	IC ( corrected )
18	7.40	1.337	48.0	47.90
13	6.20	1.224	44.0	43.91
10	4.10	0.996	37.0	36.92
7	3.30	0.894	32.0	31.93
5	2.40	0.763	28.0	27.94

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1/m [ I ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	34.918	1.3076	0.9980



Calibration curve requirements : (A).  $r > 0.990$  ; (B). At least 3 Qstd numbers are in the TSP range ( 1.1 - 1.7 m<sup>3</sup> / min ).

Remark :  $Qstd ( m^3 / min ) = 1/m [ \text{Sqrt} ( H_2O ( Pa / 760 ) ( 298 / Ta ) ) - b ]$   
 $IC ( corrected ) = I [ \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ]$   
 $FLOW ( corrected ) = \text{Sqrt} ( FLOW ( mano ) ( Pa / 760 ) ( 298 / Ta ) )$

Calibrated by : Poon Tsz Wing Checked by : Wong Yin Tong  
 Name : ( Poon Tsz Wing ) Name : ( Wong Yin Tong )

Form No. INS-HVS-CAL.dtl 16.01.2020

### Air Sampler Calibration Curve Plotting & Calculation (Dickson recorder)

Calibration curve ref. No. : ATSPC-01-2022050402 Date of calibration : 04/05/2022

The Hong Kong Society for the Blind's  
 Location : Factory cum Sheltered Workshop Sampler : TE-5170X

**Calibration Data**

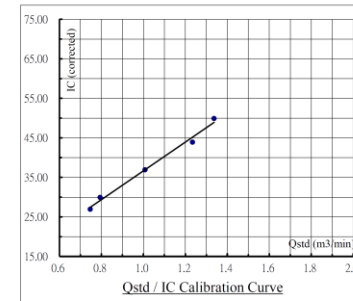
Ambient barometric pressure, Pa = 760.6 ( mmHg ) Ambient temperature, Ta = 299.45 ( deg K )  
 Qstd Slope, m = 2.03518 Qstd Intercept, b = -0.005890

**Calibration Curve**

Plate No.	H <sub>2</sub> O ( in )	Qstd ( m <sup>3</sup> / min )	I ( chart )	IC ( corrected )
18	7.40	1.337	50.0	49.90
13	6.30	1.234	44.0	43.91
10	4.20	1.008	37.0	36.92
7	2.60	0.794	30.0	29.94
5	2.30	0.747	27.0	26.94

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1/m [ I ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	36.405	0.2432	0.9953



Calibration curve requirements : (A).  $r > 0.990$  ; (B). At least 3 Qstd numbers are in the TSP range ( 1.1 - 1.7 m<sup>3</sup> / min ).

Remark :  $Qstd ( m^3 / min ) = 1/m [ \text{Sqrt} ( H_2O ( Pa / 760 ) ( 298 / Ta ) ) - b ]$   
 $IC ( corrected ) = I [ \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ]$   
 $FLOW ( corrected ) = \text{Sqrt} ( FLOW ( mano ) ( Pa / 760 ) ( 298 / Ta ) )$

Calibrated by : Poon Tsz Wing Checked by : Wong Yin Tong  
 Name : ( Poon Tsz Wing ) Name : ( Wong Yin Tong )

Form No. INS-HVS-CAL.dtl 16.01.2020



## Calibration Certificate of HVS

### Air Sampler Calibration Curve Plotting & Calculation (Dickson recorder)

Calibration curve ref. No. : ATSPC-01-2022050403 Date of calibration : 04/05/2022

Location : Hong Kong Children's Hospital Sampler : TE-5170X

**Calibration Data**

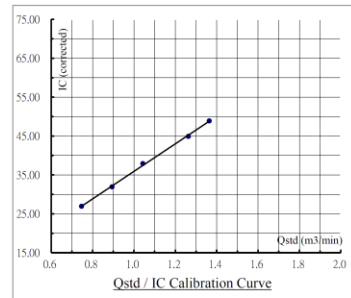
Ambient barometric pressure, Pa = 760.6 ( mmHg ) Ambient temperature, Ta = 299.45 ( deg K )  
 Qstd Slope, m = 2.03518 Qstd Intercept, b = -0.005890

**Calibration Curve**

Plate No.	H <sub>2</sub> O ( in )	Qstd ( m <sup>3</sup> / min )	I ( chart )	IC ( corrected )
18	7.70	1.364	49.0	48.90
13	6.60	1.263	45.0	44.91
10	4.50	1.043	38.0	37.92
7	3.30	0.894	32.0	31.93
5	2.30	0.747	27.0	26.94

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1 / m [ ( I ) ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	35.410	0.5079	0.9994



Calibration curve requirements : (A).  $r > 0.990$  ; (B). At least 3 Qstd numbers are in the TSP range ( 1.1 - 1.7 m<sup>3</sup> / min ).

Remark :  $Qstd ( m^3 / min ) = 1/m [ \text{Sqrt} ( H_2O ( Pa / 760 ) ( 298 / Ta ) ) - b ]$   
 $IC ( corrected ) = I [ \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ]$   
 $FLOW ( corrected ) = \text{Sqrt} ( FLOW ( mano ) ( Pa / 760 ) ( 298 / Ta ) )$

Calibrated by : Poon Tsz Wing Checked by : Wong Yin Tong  
 Name : ( Poon Tsz Wing ) Name : ( Wong Yin Tong )

Form No. INS-HVS-CAL-d1 16 01 2020

### Air Sampler Calibration Curve Plotting & Calculation (Dickson recorder)

Calibration curve ref. No. : ATSPC-01-2021072001 Date of calibration : 20/07/2021

Model no : GS2310 Serial number : 10346

**Calibration Data**

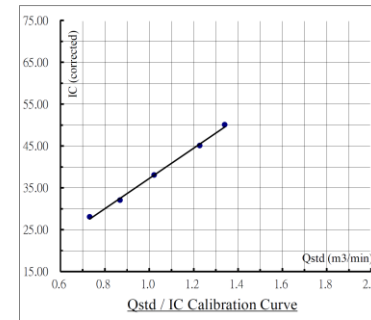
Ambient barometric pressure, Pa = 767.4 ( mmHg ) Ambient temperature, Ta = 300.25 ( deg K )  
 Qstd Slope, m = 2.03518 Qstd Intercept, b = -0.005890

**Calibration Curve**

Plate No.	H <sub>2</sub> O ( in )	Qstd ( m <sup>3</sup> / min )	I ( chart )	IC ( corrected )
18	7.40	1.341	50.0	50.05
13	6.20	1.228	45.0	45.05
10	4.30	1.023	38.0	38.04
7	3.10	0.869	32.0	32.03
5	2.20	0.732	28.0	28.03

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1 / m [ ( I ) ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	36.144	1.1009	0.9987



Calibration curve requirements : (A).  $r > 0.990$  ; (B). At least 3 Qstd numbers are in the TSP range ( 1.1 - 1.7 m<sup>3</sup> / min ).

Remark :  $Qstd ( m^3 / min ) = 1/m [ \text{Sqrt} ( H_2O ( Pa / 760 ) ( 298 / Ta ) ) - b ]$   
 $IC ( corrected ) = I [ \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ]$   
 $FLOW ( corrected ) = \text{Sqrt} ( FLOW ( mano ) ( Pa / 760 ) ( 298 / Ta ) )$

Calibrated by : Poon Tsz Wing Checked by : Wong Yin Tong  
 Name : ( Poon Tsz Wing ) Name : ( Wong Yin Tong )

Form No. INS-HVS-CAL-d1 16 01 2020

## Calibration Certificate for Calibrator



RECALIBRATION DUE DATE: <b>June 1, 2022</b>
---

### Certificate of Calibration

Calibration Certification Information			
Cal. Date: June 1, 2021	Rootsmeter S/N: 438320	Ta: 292	°K
Operator: Jim Tisch		Pa: 754.9	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: 0006		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4370	3.2	2.00
2	3	4	1	1.0130	6.4	4.00
3	5	6	1	0.9060	8.0	5.00
4	7	8	1	0.8590	8.9	5.50
5	9	10	1	0.7110	12.9	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left( \frac{Ta}{Pa} \right)}$ (y-axis)
1.0094	0.7024	1.4239	0.9958	0.6929	0.8796
1.0051	0.9922	2.0136	0.9915	0.9788	1.2439
1.0029	1.1070	2.2513	0.9894	1.0921	1.3907
1.0017	1.1662	2.3612	0.9882	1.1504	1.4586
0.9964	1.4014	2.8477	0.9829	1.3824	1.7591
<b>QSTD</b>	m= 2.03518		<b>QA</b>	m= 1.27440	
	b= -0.00589			b= -0.00364	
	r= 0.99997			r= 0.99997	

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

<b>Standard Conditions</b>
Tstd: 298.15 °K
Pstd: 760 mm Hg
<b>Key</b>
ΔH: calibrator manometer reading (in H2O)
ΔP: rootsmeter manometer reading (mm Hg)
Ta: actual absolute temperature (°K)
Pa: actual barometric pressure (mm Hg)
b: intercept
m: slope

<b>RECALIBRATION</b>
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.  
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Village of Cleves, OH 45002

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



RECALIBRATION DUE DATE: <b>May 16, 2023</b>
---

### Certificate of Calibration

Calibration Certification Information			
Cal. Date: May 16, 2022	Rootsmeter S/N: 438320	Ta: 296	°K
Operator: Jim Tisch		Pa: 746.8	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: 0006		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4050	3.2	2.00
2	3	4	1	1.0020	6.4	4.00
3	5	6	1	0.8930	7.9	5.00
4	7	8	1	0.8550	8.7	5.50
5	9	10	1	0.7030	12.8	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left( \frac{Ta}{Pa} \right)}$ (y-axis)
0.9850	0.7011	1.4066	0.9957	0.7087	0.8904
0.9807	0.9788	1.9892	0.9914	0.9895	1.2592
0.9788	1.0960	2.2240	0.9894	1.1080	1.4078
0.9777	1.1435	2.3325	0.9883	1.1560	1.4765
0.9723	1.3830	2.8131	0.9829	1.3981	1.7807
<b>QSTD</b>	m= 2.06418		<b>QA</b>	m= 1.29255	
	b= -0.03593			b= -0.02274	
	r= 0.99993			r= 0.99993	

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

<b>Standard Conditions</b>
Tstd: 298.15 °K
Pstd: 760 mm Hg
<b>Key</b>
ΔH: calibrator manometer reading (in H2O)
ΔP: rootsmeter manometer reading (mm Hg)
Ta: actual absolute temperature (°K)
Pa: actual barometric pressure (mm Hg)
b: intercept
m: slope

<b>RECALIBRATION</b>
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

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

## Catalogue of Dust Meter (TSI Sidepak AM510)

The SidePak AM510 monitor's easy-to-read display shows your data as both real-time aerosol mass-concentration and 8-hour time-weighted average (TWA). With its convenient data logging and long battery life, the AMS10 is also ideal for extended sampling. The easy-to-use TrakPro Data Analysis Software lets you create effective graphs and reports.

### User Friendly

- + Small, lightweight and quiet to maximize worker acceptance
- + Rugged design with secure belt clip
- + Easy-to-understand user interface with only four keys
- + Lockable keypad prevents tampering while sampling
- + User-adjustable sample flow rate
- + Define, label and store multiple calibration constants
- + Easy-to-read LCD display
- + Convenient, threaded tripod socket accommodates area sampling

### Advanced Features

- + Smart Battery Management System provides precise run time information, maximizes battery capacity and speeds charging
- + Integrated pump allows use of size-selective aerosol inlet conditioners
- + Built-in impactors let you choose "none," 1.0, 2.5 or 10-micron cut off
- + 10-mm Dorr-Oliver cyclone for respirable sampling
- + Display shows real-time concentrations (mg/m<sup>3</sup>) and "on-the-fly" TWA as you data log
- + Display statistics: max, min and average readings, elapsed time and 8-hour TWA

### Quick and Easy Reports

- + Convenient preprogramming for occupational exposure sampling
- + Data log for long periods and store multiple tests
- + Analyze data, print graphs and create reports with TrakPro Data Analysis Software
- + USB port lets you conveniently connect to your computer

### Power to Spare

- + Long-lasting NiMH rechargeable battery packs eliminate "memory" issues
- + Choice of rechargeable NiMH smart battery packs or AA-cell pack

### Model AMS10

#### SidePak Personal Aerosol Monitor

#### Sensitivity

Sensor Type 90° light scattering, 670 nm laser diode  
 Aerosol Concentration Range 0.001 to 20 mg/m<sup>3</sup> (calibrated to respirable fraction of ISO 12103-1, A1 test dust)  
 Particle Size Range 0.1 to 10 micrometer (µm)  
 Minimum Resolution 0.001 mg/m<sup>3</sup>  
 Zero stability ±0.001 mg/m<sup>3</sup> over 24 hours using 10-second time-constant  
 Temperature Coefficient Approximately +0.0005 mg/m<sup>3</sup> per °C (for variations from temperature at which instrument was last zeroed)

#### Flow Rate

Range User-adjustable, 0.7 to 1.8 liters/min (L/min)

#### Temperature Range

Operating Range 32 to 120°F (0 to 50°C)  
 Storage Range -4 to 140°F (-20 to 60°C)

#### Operational Humidity

0 to 95% RH, non-condensing

#### Time Constant (LCD display)

Range User-adjustable, 1 to 60 seconds

#### Data Logging

Data Points Approx. 31,000  
 Logging Interval User-adjustable, 1 second to 1 hour

#### User-Select Calibration Factors

Factory Setting 1.0 (non-adjustable)  
 User-defined Settings 3, with user-defined labels  
 Range 0.1 to 10.0, user-adjustable

#### Physical

External Dimensions 4.2 x 3.7 x 2.8 in. (106 x 92 x 70 mm) with 801723, 801724, 801729 or 801743 battery  
 5.1 x 3.7 x 2.8 in. (130 x 92 x 70 mm) with 801708, 801722, 801728, 801735, or 801736 battery  
 Weight 16 oz (0.46 kg) with 801723, 801724, 801729 or 801743 battery  
 19 oz (0.54 kg) with 801708, 01722, 801728, 801735, or 801736 battery  
 Display 2 line x 12 character LCD  
 Tripod Socket 1/4"-20 female thread

#### Power Supply/Charger (P/N 2613210)

Input Voltage Range 100 to 240 VAC, 50 to 60 Hz  
 Output Voltage 9 VDC @ 1.0 A

### Maintenance

Factory Clean/Calibrate Recommended annually  
 User Zero Calibration Before each use  
 User Flow Calibration As needed

### Communications Interface

Type USB 1.1  
 Connector, Instrument USB Mini-B (socket)

### Minimum Computer Requirements for TrakPro™ Data Analysis Software

Communications Port Universal Serial Bus (USB) v 1.1 or higher  
 Operating System Microsoft Windows® XP, or 7 (32-bit or 64-bit) operating systems

### Battery Performance

Battery Options	Charge Time (hrs)*	Intrinsic Safety Rating	Run Time (hrs @ 1.7 L/min)
1600 mAh NiMH Pack, 4.8 V (P/N 801723)	3.0	No	7.1
1650 mAh NiMH Pack, 4.8V (P/N 801724, 801729 or 801743)	3.5	CSA**	7.5
2700 mAh NiMH Pack, 4.8 V (P/N 801722 or 801728)	5.5	No	12.0
2700 mAh NiMH Pack, 4.8 V (P/N 801735)	5.5	No	12.0
6-Cell AA-size Alkaline Pack*** (P/N 801708 or 801736 with six user-supplied AA cells)	N/A	No	22.5

\*Of a fully depleted battery  
 \*\*All dust plugs and dust gaskets must be installed.  
 \*\*\*Using Energizer AA-size, E91 alkaline batteries.

### Battery Level Indicator

The Smart Battery Management System™ technology utilizes a built-in "gauge" in the SidePak™ battery packs. The gauge monitors battery capacity and calculates run time information by dividing capacity of the battery (mAh) by the instantaneous current consumed by the instrument (mA). This calculation is correct for current operating conditions and can change due to current (mA) consumption or changes in battery capacity.





## Calibration Certificate of Dust Meter (TSI Sidepak AM510)

**CERTIFICATE OF CALIBRATION AND TESTING**  
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
 Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

<b>Environment Conditions</b>			<b>Model</b>	<b>AM510</b>
Temperature	73.83 (23.2)	°F (°C)	<b>Serial Number</b>	<b>11404005</b>
Relative Humidity	26.8	%RH		
Barometric Pressure	28.49 (964.8)	inHg (hPa)		

As Left       In Tolerance  
 As Found       Out of Tolerance

**Concentration Linearity Plot**

CONCENTRATION						Unit: mg/m <sup>3</sup>			
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE		
1	1.261	1.239	1.135-1.387	3	0.046	0.050	0.032-0.060		
2	0.173	0.184	0.147-0.199	4	12.363	12.493	11.127-13.599		

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

<b>Measurement Variable</b>	<b>System ID</b>	<b>Last Cal.</b>	<b>Cal. Due</b>	<b>Measurement Variable</b>	<b>System ID</b>	<b>Last Cal.</b>	<b>Cal. Due</b>
DC Voltage	E003314	01-11-22	01-31-23	Photometer	E003319	02-22-22	08-31-22
Microbalance	M001324	01-29-21	01-31-23	Pressure	E003511	10-26-21	10-31-22
Flowmeter	E005626	03-04-22	03-31-23	DC Voltage	E003315	01-11-22	01-31-23

\_\_\_\_\_  
 Calibrated

April 14, 2022  
 \_\_\_\_\_  
 Date

### Personal Aerosol Monitor Performance check with High Volume Sampler

Performance Check ref. No. AS0220427-1      Report Issue Date 27/04/2022  
 Date of performance check 26/04/2022

**Objective:**

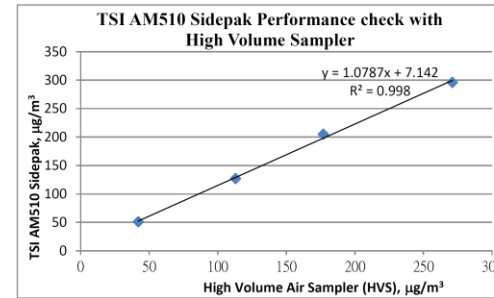
A dust meter and a Total Suspended Particulate High Volume Air Sampler (HVS) were placed together to measure the Total Suspended Particulate (TSP) concentrations simultaneously to check the performance.

**Equipment Used:**

Equipment	Manufacturer and Model	Serial Number
Personal Aerosol Monitor	TSI AM510 Sidepak	11404005
Total Suspended Particulate High Volume Air Sampler	GS2310	10346

**Results:**

Equipment	Measurement Result, µg/m <sup>3</sup>			
TSI AM510 Sidepak	51	127	205	296
High Volume Air Sampler (HVS)	42	113	177	271



Tested by : #  
 Name : ( Poon Tsz Wing )      Checked by :   
 Name : ( Wong Yin Tong )

Form No. ENV CAL SAMPLER CCI 4012/12/2003





# Catalogue of Weather Station

## Cabled Vantage Pro2™ & Vantage Pro2 Plus™ Stations



**6152C  
6162C**  
**Vantage Pro2™**

The Vantage Pro2™ (# 6152C) and Vantage Pro2™ Plus (# 6162C) cabled weather stations include two components: the Integrated Sensor Suite (ISS) and the console. The ISS contains the sensor interface module (SIM), rain collector, an anemometer, and a passive radiation shield. The Vantage Pro2 console provides the user interface, data display, and calculations. The Vantage Pro2 Plus weather station includes two additional sensors that are optional on the Vantage Pro2 and purchased separately: the UV Sensor and the Solar Radiation Sensor. The console and ISS are powered by an AC-power adapter connected to the console. Batteries can be installed in the console to provide a backup power supply. Use WeatherLink® to let your weather station interface with a computer, log data, and upload weather information to the Internet. The 6152C and 6162C models rely on passive shielding to reduce solar-radiation induced temperature errors in the outside temperature sensor readings.

### Integrated Sensor Suite (ISS)

Operating Temperature	-40° to +150°F (-40° to +65°C)
Non-operating Temperature	-40° to +158°F (-40° to +70°C)
Current Draw	5 mA (average) at 4 to 6 VDC for ISS only. 10 mA average for both console and ISS
Connectors, Sensor	Modular RJ-11
Cable Type	4-conductor, 26 AWG
Cable Length, Anemometer	40' (12 m) (included); 240' (73 m) (maximum recommended)

Note: Maximum displayable wind decreases as the length of cable increases. At 140' (42 m) of cable, the maximum wind speed displayed is 135 mph (61 m/s); at 240' (73 m), the maximum wind speed displayed is 100 mph (44 m/s).

Wind Speed Sensor	Solid state magnetic sensor
Wind Direction Sensor	Wind vane with potentiometer
Rain Collector Type	Tipping bucket, 0.01" per tip (0.2 mm with metric rain adapter), 33.2 in <sup>2</sup> (214 cm <sup>2</sup> ) collection area
Temperature Sensor Type	PN Junction Silicon Diode
Relative Humidity Sensor Type	Film capacitor element
Housing Material	UV-resistant ABS, polypropylene
Sensor Inputs	
RF Filtering	RC low-pass filter on each signal line

ISS Dimensions(not including anemometer or bird spikes):

Vantage Pro2 with Standard Rad Shield	14.0" x 9.4" x 14.5" (356 mm x 239 mm x 368 mm)
Vantage Pro2 with Fan-Aspirated Rad Shield	20.8" x 9.4" x 16.0" (528 mm x 239 mm x 406 mm)
Vantage Pro2 Plus with Standard Rad Shield	14.3" x 9.7" x 14.5" (363 mm x 246 mm x 368 mm)
Vantage Pro2 Plus with Fan-Aspirated Rad Shield	21.1" x 9.7" x 16.0" (536 mm x 246 mm x 406 mm)

**DAVIS** **® Davis Instruments** 3465 Diablo Ave., Hayward, CA 94545-2778 USA  
(510) 732-9229 • FAX (510) 670-0589 • sales@davisinstruments.com • www.davisinstruments.com

DS6152C, 6162C Rev. W 12/7/18

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7  
Vantage Pro2™

### Ultra Violet (UV) Radiation Index (requires UV sensor)

Resolution and Units	0.1 Index
Range	0 to 16 Index
Accuracy	±5% of full scale (Reference: Yankee UVB-1 at UV index 10 (Extremely High))
Cosine Response	±4% FS (0° to 90° zenith angle)
Update Interval	50 seconds to 1 minute (5 minutes when dark)
Current Graph Data	Instant Reading and Hourly Average; Daily, Monthly High
Historical Graph Data	Hourly Average, Daily, Monthly Highs
Alarm	High Threshold from Instant Calculation

### Wind

<b>Wind Chill (Calculated)</b>	
Resolution and Units	1°F or 1°C (user-selectable); °C is converted from °F and rounded to the nearest 1°C
Range	-110° to +135°F (-79° to +57°C)
Accuracy	±2°F (±1°C) (typical)
Update Interval	10 to 12 seconds
Source	United States National Weather Service (NWS)/NOAA
Equation Used	Osczevski (1995) (adopted by US NWS in 2001)
Variables Used	Instant Outside Temperature and 10-min. Avg. Wind Speed
Current Display Data	Instant Calculation
Current Graph Data	Instant Calculation; Hourly, Daily and Monthly Low
Historical Graph Data	Hourly, Daily and Monthly Lows
Alarm	Low Threshold from Instant Calculation
<b>Wind Direction</b>	
Range	1 - 360°
Display Resolution	16 points (22.5°) on compass rose, 1° in numeric display
Accuracy	±3°
Update Interval	2.5 to 3 seconds
Current Graph Data	Instant Reading (user adjustable); 10-min. Dominant; Hourly, Daily, Monthly Dominant
Historical Graph Data	Past 6 10-min. Dominants on compass rose only; Hourly, Daily, Monthly Dominants
<b>Wind Speed</b>	
Resolution and Units	1 mph, 1 km/h, 0.4 m/s, or 1 knot (user-selectable) Measured in mph; other units are converted from mph and rounded to nearest 1 km/hr, 0.1 m/s, or 1 knot.
Range	0 to 200 mph, 0 to 173 knots, 0 to 89 m/s, 0 to 322 km/h
Update Interval	Instant Reading: 2.5 to 3 seconds, 10-minute Average: 1 minute
Accuracy	±2 mph (2 kts, 3.2 km/h, 0.9 m/s) or ±5%, whichever is greater
Maximum Cable Length	540' (165 m) (Note that maximum wind speed reading decreases as length of cable from anemometer to ISS increases.)
Current Display Data	Instant
Current Graph Data	Instant Reading; 10-minute and Hourly Average; Hourly High; Daily, Monthly and Yearly High with Direction of High
Historical Graph Data	10-min. and Hourly Averages; Hourly Highs; Daily, Monthly and Yearly Highs with Direction of Highs
Alarms	High Thresholds from Instant Reading and 10-minute Average



# Calibration Certificate of Weather Station

*Actual calibration date: 10 Mar 2022*



**Cal Lab Limited 校正實驗室有限公司**  
 Room 2103, Technology Plaza, 29-35 Sha Tsui Road,  
 Tsuen Wan, NT, Hong Kong  
 Tel: +852 25680106 Email: info@callab.com.hk  
 Fax: +852 30116194 Website: www.callab.com.hk

**Calibration Certificate No.: CC0012203**

**Customer Information**

Customer: Castco Testing Centre Limited  
 Address: 33, On Kui Street, Fanling, N.T.

**Equipment Identification**

Equipment Description	Manufacturer	Model No.	Serial No.	Assigned equipment No.:
Weather Station	Davis Vantage PRO 2	6152CEU	AZ170710016	N/A

**Certificate Information**

Date of Receipt:	1 March 2022	Calibration Condition:	24.8°C, 55%RH, 1006hPa
Date of Calibration:	16 March 2022	Adjustment:	N/A
Due Date of Calibration:	N/A	Appearance:	Good
Calibration Procedure:	JJF 1183-2007, JJF 1076-2001, SOP-116	Remark:	N/A

**Reference Equipment Identification**

Equipment Description	Model	Serial No.	Expiration Date
Platinum resistance thermometer	KPPRHT-A-1	KCI I-1095, KCI P-1095	28 June 2023
Humidity sensor	KPPRHT-A-1	KCI I-1095, KCI P-1095	4 March 2022
Hot Wire Anemometer	9535	T95351316004	11 July 2022

- Note1: The estimated expanded uncertainties have been calculated in "Evaluation and expression of uncertainty in measurement" and give an internal estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.
- Note2: The standard (s) and instrument used in the calibration are traceable to national or international recognized standard and are calibrated on a schedule to maintain the accuracy and good condition.
- Note3: The result 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.
- Note4: The result shows in this calibration certificate relate only to the item calibrated, and the result only applies to the calibration item as received.

Approved By:

Rex Tse

Company Chop:



Certificate Issue Date: 18 March 2022

CF-BEG-03

1. The certificate shall not be reproduced except in full, without written approval of Cal Lab Calibration CC0012203  
 2. The certificate is issued subject to the latest Terms and Conditions, available at our web site Page 1 of 2

**Appendix F – Weather information**

General Information

Date	Absolute Daily Min Temperature (°C)	Absolute Daily Max Temperature (°C)	Total Rainfall (mm)
01/06/2022	27	30.9	1.2
02/06/2022	26	31	11.9
03/06/2022	28	31.2	1.6
04/06/2022	28.6	32	Trace
05/06/2022	28.7	32	Trace
06/06/2022	27.6	30.6	2.5
07/06/2022	24.6	29.6	33.8
08/06/2022	24.7	28	66
09/06/2022	25	27.9	28.7
10/06/2022	25	27.3	25.8
11/06/2022	25.3	29.1	47.5
12/06/2022	25.6	30.3	2.6
13/06/2022	28.1	30.6	0
14/06/2022	24.8	29.3	42.8
15/06/2022	24	30.5	11
16/06/2022	24.3	30.5	2.6
17/06/2022	28	31	1
18/06/2022	27.5	29.8	1.3
19/06/2022	28	30.9	0.1
20/06/2022	27.6	30.4	2.8
21/06/2022	28.6	30.5	Trace
22/06/2022	28.1	31.8	0
23/06/2022	27.9	33.8	0
24/06/2022	27.8	33.4	0
25/06/2022	27.7	32.8	0
26/06/2022	26.8	33.9	0.3
27/06/2022	27.8	33.4	0.1
28/06/2022	28.2	34.4	0
29/06/2022	28.1	33.9	0.7
30/06/2022	25.9	29.6	64.9

NOTE1: The above weather information was obtained from manned weather station of Hong Kong Observatory.

NOTE2: Trace means rainfall less than 0.05 mm

<https://www.hko.gov.hk/en/cis/dailyExtract.htm?y=2022&m=06>

Mean Wind Speed and Wind Direction recorded by the weather station setup at the rooftop of Hong Kong Children's Hospital

Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction
01/06/2022	0:00	0.4	202.5	02/06/2022	0:00	0.9	247.5	03/06/2022	0:00	0.4	112.5	04/06/2022	0:00	0.4	112.5
01/06/2022	1:00	0.9	202.5	02/06/2022	1:00	0.9	247.5	03/06/2022	1:00	0.4	112.5	04/06/2022	1:00	0.4	112.5
01/06/2022	2:00	0.4	112.5	02/06/2022	2:00	0.9	270	03/06/2022	2:00	0.4	135	04/06/2022	2:00	0.4	112.5
01/06/2022	3:00	0.4	112.5	02/06/2022	3:00	0.4	247.5	03/06/2022	3:00	0.4	135	04/06/2022	3:00	0.4	90
01/06/2022	4:00	0.4	112.5	02/06/2022	4:00	0.4	270	03/06/2022	4:00	0.4	112.5	04/06/2022	4:00	0.9	112.5
01/06/2022	5:00	0.4	112.5	02/06/2022	5:00	0.9	270	03/06/2022	5:00	0.4	112.5	04/06/2022	5:00	0.4	112.5
01/06/2022	6:00	0.4	112.5	02/06/2022	6:00	0.9	112.5	03/06/2022	6:00	0.4	90	04/06/2022	6:00	0.4	67.5
01/06/2022	7:00	0.4	112.5	02/06/2022	7:00	0.4	112.5	03/06/2022	7:00	0.4	90	04/06/2022	7:00	0.4	112.5
01/06/2022	8:00	0.4	112.5	02/06/2022	8:00	0.9	135	03/06/2022	8:00	0.4	112.5	04/06/2022	8:00	0.9	112.5
01/06/2022	9:00	0.4	135	02/06/2022	9:00	0.4	90	03/06/2022	9:00	0.9	112.5	04/06/2022	9:00	0.9	45
01/06/2022	10:00	0.4	135	02/06/2022	10:00	0.9	90	03/06/2022	10:00	0.4	112.5	04/06/2022	10:00	0.9	112.5
01/06/2022	11:00	0.9	90	02/06/2022	11:00	0.9	90	03/06/2022	11:00	0.4	112.5	04/06/2022	11:00	1.3	112.5
01/06/2022	12:00	0.9	90	02/06/2022	12:00	0.4	112.5	03/06/2022	12:00	0.4	112.5	04/06/2022	12:00	1.3	315
01/06/2022	13:00	0.9	112.5	02/06/2022	13:00	0.4	22.5	03/06/2022	13:00	0.9	90	04/06/2022	13:00	0.9	270
01/06/2022	14:00	0.9	112.5	02/06/2022	14:00	0.4	90	03/06/2022	14:00	0.9	180	04/06/2022	14:00	1.3	270
01/06/2022	15:00	0.9	112.5	02/06/2022	15:00	0.4	90	03/06/2022	15:00	0.4	247.5	04/06/2022	15:00	0.9	247.5
01/06/2022	16:00	0.9	135	02/06/2022	16:00	0.4	112.5	03/06/2022	16:00	0.4	225	04/06/2022	16:00	0.9	45
01/06/2022	17:00	0.9	135	02/06/2022	17:00	0.9	112.5	03/06/2022	17:00	0.9	225	04/06/2022	17:00	1.3	67.5
01/06/2022	18:00	0.9	112.5	02/06/2022	18:00	0.9	90	03/06/2022	18:00	1.3	247.5	04/06/2022	18:00	0.9	135
01/06/2022	19:00	0.9	112.5	02/06/2022	19:00	1.3	112.5	03/06/2022	19:00	1.3	247.5	04/06/2022	19:00	1.3	90
01/06/2022	20:00	0.4	180	02/06/2022	20:00	1.3	112.5	03/06/2022	20:00	0.9	247.5	04/06/2022	20:00	0.9	112.5
01/06/2022	21:00	0.4	135	02/06/2022	21:00	2.7	135	03/06/2022	21:00	1.3	315	04/06/2022	21:00	0.9	90
01/06/2022	22:00	0.4	112.5	02/06/2022	22:00	3.6	135	03/06/2022	22:00	0.9	270	04/06/2022	22:00	1.3	112.5
01/06/2022	23:00	0.4	112.5	02/06/2022	23:00	2.2	135	03/06/2022	23:00	0.4	247.5	04/06/2022	23:00	0.9	90

Mean Wind Speed and Wind Direction recorded by the weather station setup at the rooftop of Hong Kong Children's Hospital

Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction
05/06/2022	0:00	0.9	112.5	06/06/2022	0:00	0.4	225	07/06/2022	0:00	0.9	135	08/06/2022	0:00	1.8	90
05/06/2022	1:00	0.4	112.5	06/06/2022	1:00	0.9	247.5	07/06/2022	1:00	0.4	135	08/06/2022	1:00	1.3	225
05/06/2022	2:00	0.4	135	06/06/2022	2:00	0.9	225	07/06/2022	2:00	0.4	225	08/06/2022	2:00	2.2	270
05/06/2022	3:00	0.4	112.5	06/06/2022	3:00	0.9	180	07/06/2022	3:00	0.4	247.5	08/06/2022	3:00	2.7	225
05/06/2022	4:00	0.4	90	06/06/2022	4:00	1.3	202.5	07/06/2022	4:00	0.4	247.5	08/06/2022	4:00	2.2	157.5
05/06/2022	5:00	0.4	135	06/06/2022	5:00	0.9	202.5	07/06/2022	5:00	0.4	270	08/06/2022	5:00	1.8	67.5
05/06/2022	6:00	0.4	112.5	06/06/2022	6:00	0.4	225	07/06/2022	6:00	0.9	225	08/06/2022	6:00	2.2	135
05/06/2022	7:00	0.4	112.5	06/06/2022	7:00	0.9	247.5	07/06/2022	7:00	0.4	247.5	08/06/2022	7:00	2.2	292.5
05/06/2022	8:00	0.9	112.5	06/06/2022	8:00	0.9	270	07/06/2022	8:00	0.4	247.5	08/06/2022	8:00	1.8	112.5
05/06/2022	9:00	2.2	112.5	06/06/2022	9:00	0.9	315	07/06/2022	9:00	0.4	225	08/06/2022	9:00	1.3	157.5
05/06/2022	10:00	1.3	135	06/06/2022	10:00	0.9	67.5	07/06/2022	10:00	0.4	202.5	08/06/2022	10:00	0.9	247.5
05/06/2022	11:00	1.3	135	06/06/2022	11:00	0.9	67.5	07/06/2022	11:00	0.4	247.5	08/06/2022	11:00	0.4	135
05/06/2022	12:00	1.3	135	06/06/2022	12:00	0.9	67.5	07/06/2022	12:00	0.4	225	08/06/2022	12:00	0.4	247.5
05/06/2022	13:00	0.9	112.5	06/06/2022	13:00	0.4	112.5	07/06/2022	13:00	0.9	247.5	08/06/2022	13:00	0.4	247.5
05/06/2022	14:00	0.9	270	06/06/2022	14:00	0.9	112.5	07/06/2022	14:00	0.9	225	08/06/2022	14:00	0.4	225
05/06/2022	15:00	0.4	270	06/06/2022	15:00	0.9	112.5	07/06/2022	15:00	0.9	112.5	08/06/2022	15:00	0.4	270
05/06/2022	16:00	0.4	202.5	06/06/2022	16:00	0.4	135	07/06/2022	16:00	0.4	112.5	08/06/2022	16:00	0.4	247.5
05/06/2022	17:00	0.4	180	06/06/2022	17:00	0.4	112.5	07/06/2022	17:00	0.4	90	08/06/2022	17:00	0.9	270
05/06/2022	18:00	0.9	202.5	06/06/2022	18:00	0.4	112.5	07/06/2022	18:00	0.9	157.5	08/06/2022	18:00	0.9	247.5
05/06/2022	19:00	0.9	292.5	06/06/2022	19:00	0.4	112.5	07/06/2022	19:00	0.9	247.5	08/06/2022	19:00	0.9	270
05/06/2022	20:00	0.4	225	06/06/2022	20:00	0.4	112.5	07/06/2022	20:00	1.3	247.5	08/06/2022	20:00	0.9	247.5
05/06/2022	21:00	0.4	135	06/06/2022	21:00	0.4	112.5	07/06/2022	21:00	0.4	270	08/06/2022	21:00	0.9	225
05/06/2022	22:00	0.4	225	06/06/2022	22:00	1.3	90	07/06/2022	22:00	0.9	270	08/06/2022	22:00	0.9	247.5
05/06/2022	23:00	0.4	180	06/06/2022	23:00	1.8	157.5	07/06/2022	23:00	0.4	180	08/06/2022	23:00	0.9	247.5

Mean Wind Speed and Wind Direction recorded by the weather station setup at the rooftop of Hong Kong Children's Hospital

Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction
09/06/2022	0:00	0.4	225	10/06/2022	0:00	0.9	247.5	11/06/2022	0:00	2.2	112.5	12/06/2022	0:00	0.9	247.5
09/06/2022	1:00	0.4	225	10/06/2022	1:00	0.4	247.5	11/06/2022	1:00	1.8	270	12/06/2022	1:00	1.8	225
09/06/2022	2:00	0.4	135	10/06/2022	2:00	0.4	247.5	11/06/2022	2:00	1.8	157.5	12/06/2022	2:00	2.7	270
09/06/2022	3:00	0.9	135	10/06/2022	3:00	0.9	225	11/06/2022	3:00	2.2	202.5	12/06/2022	3:00	3.6	270
09/06/2022	4:00	0.9	135	10/06/2022	4:00	0.9	225	11/06/2022	4:00	2.2	270	12/06/2022	4:00	3.1	157.5
09/06/2022	5:00	0.9	225	10/06/2022	5:00	0.9	247.5	11/06/2022	5:00	1.8	247.5	12/06/2022	5:00	3.1	202.5
09/06/2022	6:00	0.9	247.5	10/06/2022	6:00	0.9	247.5	11/06/2022	6:00	2.2	90	12/06/2022	6:00	3.6	270
09/06/2022	7:00	0.9	247.5	10/06/2022	7:00	0.9	247.5	11/06/2022	7:00	1.8	270	12/06/2022	7:00	1.8	247.5
09/06/2022	8:00	0.9	270	10/06/2022	8:00	0.9	247.5	11/06/2022	8:00	1.3	270	12/06/2022	8:00	0.9	90
09/06/2022	9:00	0.9	225	10/06/2022	9:00	1.3	225	11/06/2022	9:00	1.3	270	12/06/2022	9:00	0.9	270
09/06/2022	10:00	0.9	247.5	10/06/2022	10:00	1.8	247.5	11/06/2022	10:00	1.3	247.5	12/06/2022	10:00	0.4	270
09/06/2022	11:00	0.9	247.5	10/06/2022	11:00	1.8	225	11/06/2022	11:00	1.3	270	12/06/2022	11:00	0.9	270
09/06/2022	12:00	0.4	225	10/06/2022	12:00	1.8	270	11/06/2022	12:00	1.3	247.5	12/06/2022	12:00	1.3	247.5
09/06/2022	13:00	1.3	202.5	10/06/2022	13:00	1.8	247.5	11/06/2022	13:00	1.8	225	12/06/2022	13:00	0.9	270
09/06/2022	14:00	0.9	112.5	10/06/2022	14:00	2.2	270	11/06/2022	14:00	1.3	225	12/06/2022	14:00	0.4	247.5
09/06/2022	15:00	0.4	112.5	10/06/2022	15:00	2.2	247.5	11/06/2022	15:00	1.8	247.5	12/06/2022	15:00	0.4	225
09/06/2022	16:00	0.9	112.5	10/06/2022	16:00	1.8	225	11/06/2022	16:00	2.2	225	12/06/2022	16:00	0.4	225
09/06/2022	17:00	0.4	112.5	10/06/2022	17:00	1.8	247.5	11/06/2022	17:00	2.2	225	12/06/2022	17:00	0.4	247.5
09/06/2022	18:00	0.9	135	10/06/2022	18:00	1.8	270	11/06/2022	18:00	2.2	247.5	12/06/2022	18:00	1.3	225
09/06/2022	19:00	0.4	112.5	10/06/2022	19:00	0.9	247.5	11/06/2022	19:00	1.3	247.5	12/06/2022	19:00	0.4	225
09/06/2022	20:00	0.4	112.5	10/06/2022	20:00	1.3	270	11/06/2022	20:00	1.8	292.5	12/06/2022	20:00	0.4	225
09/06/2022	21:00	0.9	112.5	10/06/2022	21:00	1.8	90	11/06/2022	21:00	1.3	225	12/06/2022	21:00	1.3	247.5
09/06/2022	22:00	0.9	112.5	10/06/2022	22:00	2.2	202.5	11/06/2022	22:00	1.3	225	12/06/2022	22:00	0.4	247.5
09/06/2022	23:00	0.4	112.5	10/06/2022	23:00	1.8	202.5	11/06/2022	23:00	1.8	225	12/06/2022	23:00	0.9	225



Mean Wind Speed and Wind Direction recorded by the weather station setup at the rooftop of Hong Kong Children's Hospital

Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction
13/06/2022	0:00	0.4	225	14/06/2022	0:00	1.3	225	15/06/2022	0:00	0.4	225	16/06/2022	0:00	1.3	90
13/06/2022	1:00	0.4	135	14/06/2022	1:00	1.3	270	15/06/2022	1:00	0.4	270	16/06/2022	1:00	1.3	135
13/06/2022	2:00	0.4	45	14/06/2022	2:00	1.3	247.5	15/06/2022	2:00	0.9	112.5	16/06/2022	2:00	1.3	90
13/06/2022	3:00	0.9	135	14/06/2022	3:00	0.9	112.5	15/06/2022	3:00	0.4	270	16/06/2022	3:00	0.9	90
13/06/2022	4:00	0.9	112.5	14/06/2022	4:00	0.4	112.5	15/06/2022	4:00	0.9	135	16/06/2022	4:00	0.9	90
13/06/2022	5:00	0.4	202.5	14/06/2022	5:00	0.4	247.5	15/06/2022	5:00	0.4	225	16/06/2022	5:00	1.3	135
13/06/2022	6:00	0.4	112.5	14/06/2022	6:00	0.4	247.5	15/06/2022	6:00	0.4	67.5	16/06/2022	6:00	0.4	90
13/06/2022	7:00	0.9	135	14/06/2022	7:00	0.4	270	15/06/2022	7:00	0.4	45	16/06/2022	7:00	0.9	112.5
13/06/2022	8:00	0.9	135	14/06/2022	8:00	0.9	270	15/06/2022	8:00	0.4	315	16/06/2022	8:00	1.3	112.5
13/06/2022	9:00	0.4	112.5	14/06/2022	9:00	0.9	112.5	15/06/2022	9:00	0.4	22.5	16/06/2022	9:00	1.3	112.5
13/06/2022	10:00	0.4	247.5	14/06/2022	10:00	0.9	247.5	15/06/2022	10:00	0.9	67.5	16/06/2022	10:00	1.3	112.5
13/06/2022	11:00	0.9	247.5	14/06/2022	11:00	0.4	225	15/06/2022	11:00	1.3	112.5	16/06/2022	11:00	1.3	112.5
13/06/2022	12:00	0.4	135	14/06/2022	12:00	0.9	247.5	15/06/2022	12:00	1.3	247.5	16/06/2022	12:00	0.9	112.5
13/06/2022	13:00	0.4	135	14/06/2022	13:00	0.9	247.5	15/06/2022	13:00	1.3	225	16/06/2022	13:00	0.9	90
13/06/2022	14:00	0.9	135	14/06/2022	14:00	0.9	67.5	15/06/2022	14:00	0.9	202.5	16/06/2022	14:00	0.9	135
13/06/2022	15:00	0.4	135	14/06/2022	15:00	0.9	202.5	15/06/2022	15:00	0.9	90	16/06/2022	15:00	1.3	112.5
13/06/2022	16:00	1.8	90	14/06/2022	16:00	0.4	247.5	15/06/2022	16:00	0.4	22.5	16/06/2022	16:00	0.9	157.5
13/06/2022	17:00	2.7	90	14/06/2022	17:00	0.4	270	15/06/2022	17:00	0.9	90	16/06/2022	17:00	0.4	90
13/06/2022	18:00	1.3	22.5	14/06/2022	18:00	0.9	247.5	15/06/2022	18:00	0.4	225	16/06/2022	18:00	0.9	135
13/06/2022	19:00	0.9	247.5	14/06/2022	19:00	0.9	270	15/06/2022	19:00	0.9	247.5	16/06/2022	19:00	1.3	135
13/06/2022	20:00	0.4	270	14/06/2022	20:00	0.9	90	15/06/2022	20:00	1.3	247.5	16/06/2022	20:00	0.9	90
13/06/2022	21:00	0.4	67.5	14/06/2022	21:00	0.4	45	15/06/2022	21:00	0.9	112.5	16/06/2022	21:00	0.9	112.5
13/06/2022	22:00	0.4	225	14/06/2022	22:00	0.9	112.5	15/06/2022	22:00	0.4	45	16/06/2022	22:00	0.9	247.5
13/06/2022	23:00	0.4	225	14/06/2022	23:00	0.4	135	15/06/2022	23:00	0.9	90	16/06/2022	23:00	0.4	225

Mean Wind Speed and Wind Direction recorded by the weather station setup at the rooftop of Hong Kong Children's Hospital

Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction
17/06/2022	0:00	0.9	135	18/06/2022	0:00	0.9	135	19/06/2022	0:00	0.9	90	20/06/2022	0:00	1.3	112.5
17/06/2022	1:00	0.9	112.5	18/06/2022	1:00	0.4	270	19/06/2022	1:00	0.9	45	20/06/2022	1:00	0.9	112.5
17/06/2022	2:00	0.9	112.5	18/06/2022	2:00	0.4	157.5	19/06/2022	2:00	1.3	270	20/06/2022	2:00	0.4	270
17/06/2022	3:00	1.3	112.5	18/06/2022	3:00	0.4	67.5	19/06/2022	3:00	1.3	22.5	20/06/2022	3:00	0.9	112.5
17/06/2022	4:00	0.9	135	18/06/2022	4:00	0.9	270	19/06/2022	4:00	1.3	22.5	20/06/2022	4:00	1.3	112.5
17/06/2022	5:00	0.9	135	18/06/2022	5:00	0.9	270	19/06/2022	5:00	1.3	247.5	20/06/2022	5:00	0.9	112.5
17/06/2022	6:00	1.3	135	18/06/2022	6:00	0.9	90	19/06/2022	6:00	1.3	157.5	20/06/2022	6:00	0.9	112.5
17/06/2022	7:00	0.9	90	18/06/2022	7:00	0.9	157.5	19/06/2022	7:00	1.3	135	20/06/2022	7:00	0.9	112.5
17/06/2022	8:00	0.9	90	18/06/2022	8:00	0.4	270	19/06/2022	8:00	1.3	90	20/06/2022	8:00	0.4	90
17/06/2022	9:00	0.9	67.5	18/06/2022	9:00	0.4	112.5	19/06/2022	9:00	1.3	112.5	20/06/2022	9:00	0.4	135
17/06/2022	10:00	0.4	112.5	18/06/2022	10:00	0.4	112.5	19/06/2022	10:00	1.3	112.5	20/06/2022	10:00	0.9	135
17/06/2022	11:00	0.9	112.5	18/06/2022	11:00	0.9	112.5	19/06/2022	11:00	0.4	135	20/06/2022	11:00	0.9	135
17/06/2022	12:00	0.9	90	18/06/2022	12:00	0.4	112.5	19/06/2022	12:00	0.4	112.5	20/06/2022	12:00	0.4	112.5
17/06/2022	13:00	0.9	112.5	18/06/2022	13:00	0.9	90	19/06/2022	13:00	0.4	112.5	20/06/2022	13:00	0.4	112.5
17/06/2022	14:00	1.3	112.5	18/06/2022	14:00	0.4	157.5	19/06/2022	14:00	0.4	90	20/06/2022	14:00	0.4	112.5
17/06/2022	15:00	0.9	90	18/06/2022	15:00	0.9	112.5	19/06/2022	15:00	0.9	112.5	20/06/2022	15:00	0.4	270
17/06/2022	16:00	1.3	112.5	18/06/2022	16:00	0.4	90	19/06/2022	16:00	1.3	112.5	20/06/2022	16:00	0.4	270
17/06/2022	17:00	0.9	90	18/06/2022	17:00	0.9	90	19/06/2022	17:00	1.3	90	20/06/2022	17:00	0.4	270
17/06/2022	18:00	0.9	112.5	18/06/2022	18:00	0.9	90	19/06/2022	18:00	1.3	90	20/06/2022	18:00	0.4	180
17/06/2022	19:00	1.3	112.5	18/06/2022	19:00	0.9	67.5	19/06/2022	19:00	0.9	135	20/06/2022	19:00	0.9	112.5
17/06/2022	20:00	1.3	90	18/06/2022	20:00	0.9	112.5	19/06/2022	20:00	0.9	135	20/06/2022	20:00	0.9	112.5
17/06/2022	21:00	1.8	90	18/06/2022	21:00	1.3	112.5	19/06/2022	21:00	0.9	112.5	20/06/2022	21:00	0.9	112.5
17/06/2022	22:00	2.2	112.5	18/06/2022	22:00	1.3	112.5	19/06/2022	22:00	0.9	112.5	20/06/2022	22:00	1.3	90
17/06/2022	23:00	1.8	112.5	18/06/2022	23:00	1.3	135	19/06/2022	23:00	0.4	112.5	20/06/2022	23:00	0.9	67.5

Mean Wind Speed and Wind Direction recorded by the weather station setup at the rooftop of Hong Kong Children's Hospital

Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction
21/06/2022	0:00	0.4	45	22/06/2022	0:00	0.4	270	23/06/2022	0:00	0.4	135	24/06/2022	0:00	0.9	112.5
21/06/2022	1:00	0.4	90	22/06/2022	1:00	0.4	247.5	23/06/2022	1:00	0.9	157.5	24/06/2022	1:00	1.3	112.5
21/06/2022	2:00	0.4	135	22/06/2022	2:00	0.4	270	23/06/2022	2:00	0.9	112.5	24/06/2022	2:00	0.4	90
21/06/2022	3:00	0.9	90	22/06/2022	3:00	0.4	270	23/06/2022	3:00	1.3	112.5	24/06/2022	3:00	0.4	157.5
21/06/2022	4:00	0.4	135	22/06/2022	4:00	0.9	180	23/06/2022	4:00	0.9	270	24/06/2022	4:00	0.4	112.5
21/06/2022	5:00	0.4	112.5	22/06/2022	5:00	1.3	247.5	23/06/2022	5:00	0.9	270	24/06/2022	5:00	0.9	112.5
21/06/2022	6:00	0.4	157.5	22/06/2022	6:00	1.3	270	23/06/2022	6:00	0.9	247.5	24/06/2022	6:00	0.9	112.5
21/06/2022	7:00	0.9	180	22/06/2022	7:00	1.3	180	23/06/2022	7:00	0.9	247.5	24/06/2022	7:00	0.9	90
21/06/2022	8:00	0.4	225	22/06/2022	8:00	1.3	135	23/06/2022	8:00	0.9	270	24/06/2022	8:00	0.9	112.5
21/06/2022	9:00	0.4	270	22/06/2022	9:00	0.9	247.5	23/06/2022	9:00	0.9	270	24/06/2022	9:00	0.9	135
21/06/2022	10:00	0.4	112.5	22/06/2022	10:00	0.9	247.5	23/06/2022	10:00	0.4	247.5	24/06/2022	10:00	0.4	135
21/06/2022	11:00	0.4	270	22/06/2022	11:00	1.3	270	23/06/2022	11:00	0.9	247.5	24/06/2022	11:00	0.4	90
21/06/2022	12:00	0.4	247.5	22/06/2022	12:00	0.9	270	23/06/2022	12:00	0.9	247.5	24/06/2022	12:00	0.9	90
21/06/2022	13:00	0.4	247.5	22/06/2022	13:00	0.9	225	23/06/2022	13:00	0.9	135	24/06/2022	13:00	0.4	135
21/06/2022	14:00	0.4	247.5	22/06/2022	14:00	0.4	112.5	23/06/2022	14:00	0.9	112.5	24/06/2022	14:00	0.4	135
21/06/2022	15:00	0.4	247.5	22/06/2022	15:00	0.9	112.5	23/06/2022	15:00	0.9	112.5	24/06/2022	15:00	0.9	112.5
21/06/2022	16:00	0.4	247.5	22/06/2022	16:00	0.4	112.5	23/06/2022	16:00	1.3	112.5	24/06/2022	16:00	0.9	315
21/06/2022	17:00	1.3	247.5	22/06/2022	17:00	0.9	135	23/06/2022	17:00	1.3	112.5	24/06/2022	17:00	1.3	247.5
21/06/2022	18:00	2.2	247.5	22/06/2022	18:00	0.4	135	23/06/2022	18:00	0.4	90	24/06/2022	18:00	0.9	247.5
21/06/2022	19:00	1.8	270	22/06/2022	19:00	0.9	22.5	23/06/2022	19:00	0.4	112.5	24/06/2022	19:00	0.9	202.5
21/06/2022	20:00	1.8	270	22/06/2022	20:00	1.3	247.5	23/06/2022	20:00	0.4	112.5	24/06/2022	20:00	0.9	135
21/06/2022	21:00	0.9	270	22/06/2022	21:00	0.9	270	23/06/2022	21:00	0.9	112.5	24/06/2022	21:00	0.9	67.5
21/06/2022	22:00	0.9	247.5	22/06/2022	22:00	0.9	157.5	23/06/2022	22:00	0.9	225	24/06/2022	22:00	1.3	90
21/06/2022	23:00	0.9	202.5	22/06/2022	23:00	0.9	157.5	23/06/2022	23:00	0.9	225	24/06/2022	23:00	0.9	135

Mean Wind Speed and Wind Direction recorded by the weather station setup at the rooftop of Hong Kong Children's Hospital

Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction
25/06/2022	0:00	0.9	112.5	26/06/2022	0:00	1.3	112.5	27/06/2022	0:00	0.9	90	28/06/2022	0:00	1.8	112.5
25/06/2022	1:00	0.4	90	26/06/2022	1:00	1.3	112.5	27/06/2022	1:00	0.4	112.5	28/06/2022	1:00	2.2	22.5
25/06/2022	2:00	0.4	270	26/06/2022	2:00	1.3	135	27/06/2022	2:00	1.8	135	28/06/2022	2:00	2.2	270
25/06/2022	3:00	0.4	135	26/06/2022	3:00	0.9	112.5	27/06/2022	3:00	1.3	22.5	28/06/2022	3:00	2.7	112.5
25/06/2022	4:00	0.9	135	26/06/2022	4:00	0.9	90	27/06/2022	4:00	0.9	112.5	28/06/2022	4:00	2.2	112.5
25/06/2022	5:00	0.4	112.5	26/06/2022	5:00	1.3	112.5	27/06/2022	5:00	1.8	112.5	28/06/2022	5:00	2.7	135
25/06/2022	6:00	0.9	112.5	26/06/2022	6:00	0.9	112.5	27/06/2022	6:00	1.8	112.5	28/06/2022	6:00	2.2	112.5
25/06/2022	7:00	0.4	135	26/06/2022	7:00	1.3	112.5	27/06/2022	7:00	1.8	135	28/06/2022	7:00	2.2	112.5
25/06/2022	8:00	0.4	112.5	26/06/2022	8:00	1.3	90	27/06/2022	8:00	1.8	90	28/06/2022	8:00	1.8	90
25/06/2022	9:00	0.9	225	26/06/2022	9:00	0.9	112.5	27/06/2022	9:00	1.8	90	28/06/2022	9:00	2.2	90
25/06/2022	10:00	0.9	247.5	26/06/2022	10:00	0.9	135	27/06/2022	10:00	1.3	112.5	28/06/2022	10:00	2.7	90
25/06/2022	11:00	1.3	135	26/06/2022	11:00	0.9	112.5	27/06/2022	11:00	1.3	90	28/06/2022	11:00	2.7	157.5
25/06/2022	12:00	1.3	90	26/06/2022	12:00	0.9	112.5	27/06/2022	12:00	0.9	112.5	28/06/2022	12:00	1.8	67.5
25/06/2022	13:00	0.9	292.5	26/06/2022	13:00	1.3	112.5	27/06/2022	13:00	1.3	22.5	28/06/2022	13:00	2.7	45
25/06/2022	14:00	1.3	292.5	26/06/2022	14:00	0.9	112.5	27/06/2022	14:00	0.9	90	28/06/2022	14:00	2.7	67.5
25/06/2022	15:00	1.3	112.5	26/06/2022	15:00	1.3	90	27/06/2022	15:00	2.2	112.5	28/06/2022	15:00	2.7	135
25/06/2022	16:00	1.3	112.5	26/06/2022	16:00	0.9	292.5	27/06/2022	16:00	1.3	90	28/06/2022	16:00	2.7	337.5
25/06/2022	17:00	0.9	270	26/06/2022	17:00	0.9	337.5	27/06/2022	17:00	1.3	112.5	28/06/2022	17:00	2.7	315
25/06/2022	18:00	1.3	180	26/06/2022	18:00	0.9	270	27/06/2022	18:00	0.9	112.5	28/06/2022	18:00	2.7	90
25/06/2022	19:00	1.3	135	26/06/2022	19:00	0.9	292.5	27/06/2022	19:00	0.9	90	28/06/2022	19:00	3.1	112.5
25/06/2022	20:00	0.4	135	26/06/2022	20:00	0.9	337.5	27/06/2022	20:00	1.3	90	28/06/2022	20:00	2.7	112.5
25/06/2022	21:00	0.4	157.5	26/06/2022	21:00	1.3	135	27/06/2022	21:00	1.3	112.5	28/06/2022	21:00	3.1	45
25/06/2022	22:00	0.9	112.5	26/06/2022	22:00	1.3	67.5	27/06/2022	22:00	3.6	337.5	28/06/2022	22:00	3.1	90
25/06/2022	23:00	0.4	112.5	26/06/2022	23:00	1.8	45	27/06/2022	23:00	2.7	67.5	28/06/2022	23:00	2.7	67.5

Mean Wind Speed and Wind Direction recorded by the weather station setup at the rooftop of Hong Kong Children's Hospital

Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction
29/06/2022	0:00	3.6	90	30/06/2022	0:00	5.8	90								
29/06/2022	1:00	3.6	90	30/06/2022	1:00	4.5	112.5								
29/06/2022	2:00	3.6	112.5	30/06/2022	2:00	4	90								
29/06/2022	3:00	3.1	112.5	30/06/2022	3:00	4	90								
29/06/2022	4:00	3.6	67.5	30/06/2022	4:00	3.6	112.5								
29/06/2022	5:00	3.6	90	30/06/2022	5:00	1.8	90								
29/06/2022	6:00	3.6	135	30/06/2022	6:00	2.7	90								
29/06/2022	7:00	3.6	67.5	30/06/2022	7:00	3.1	90								
29/06/2022	8:00	3.1	90	30/06/2022	8:00	3.1	90								
29/06/2022	9:00	4	90	30/06/2022	9:00	4	90								
29/06/2022	10:00	3.1	45	30/06/2022	10:00	4	90								
29/06/2022	11:00	2.7	67.5	30/06/2022	11:00	3.1	90								
29/06/2022	12:00	4	112.5	30/06/2022	12:00	3.1	90								
29/06/2022	13:00	5.4	90	30/06/2022	13:00	3.6	90								
29/06/2022	14:00	3.6	135	30/06/2022	14:00	2.7	90								
29/06/2022	15:00	4	90	30/06/2022	15:00	2.2	90								
29/06/2022	16:00	3.1	67.5	30/06/2022	16:00	1.8	67.5								
29/06/2022	17:00	2.7	90	30/06/2022	17:00	3.1	67.5								
29/06/2022	18:00	2.7	90	30/06/2022	18:00	3.1	45								
29/06/2022	19:00	2.7	90	30/06/2022	19:00	3.1	67.5								
29/06/2022	20:00	3.6	112.5	30/06/2022	20:00	2.2	67.5								
29/06/2022	21:00	4.9	90	30/06/2022	21:00	2.2	67.5								
29/06/2022	22:00	4	90	30/06/2022	22:00	1.8	67.5								
29/06/2022	23:00	4	90	30/06/2022	23:00	2.7	45								

# **Appendix G – 24-hr TSP monitoring results and graphical presentation**



Location: AM3 – Sky Tower

Start Date	Weather	Air Temp. (°C)	Atmospheric Pressure (hPa)	Filter weight (g)		Particulate weight (g)	Elapse Time		Sampling Time (min)	Flow Rate (cfm)		Av. Flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
				Initial	Final		Initial	Final		Initial	Final			
04/06/2022	Cloudy	31.1	1005.8	15.2214	15.3069	0.0855	2022/6/4 13:05	2022/6/5 13:05	1440	48	48	1.32	1898	45
10/06/2022	Cloudy	27.3	1005.4	18.2608	18.3381	0.0773	2022/6/10 13:05	2022/6/11 13:05	1440	48	48	1.33	1910	40
16/06/2022	Cloudy	30.9	1008.9	14.9613	15.0307	0.0694	2022/6/16 10:05	2022/6/17 10:05	1440	52	52	1.43	2065	34
22/06/2022	Sunny	30.5	1009.6	18.9507	19.1065	0.1558	2022/6/22 13:08	2022/6/23 13:08	1440	52	52	1.44	2067	75
28/06/2022	Sunny	32.9	1005.1	18.3337	18.3865	0.0528	2022/6/28 9:12	2022/6/29 9:12	1440	50	50	1.37	1973	27
													Maximum	75
													Minimum	27
													Average	44
													Action Level	182
													Limit Level	260

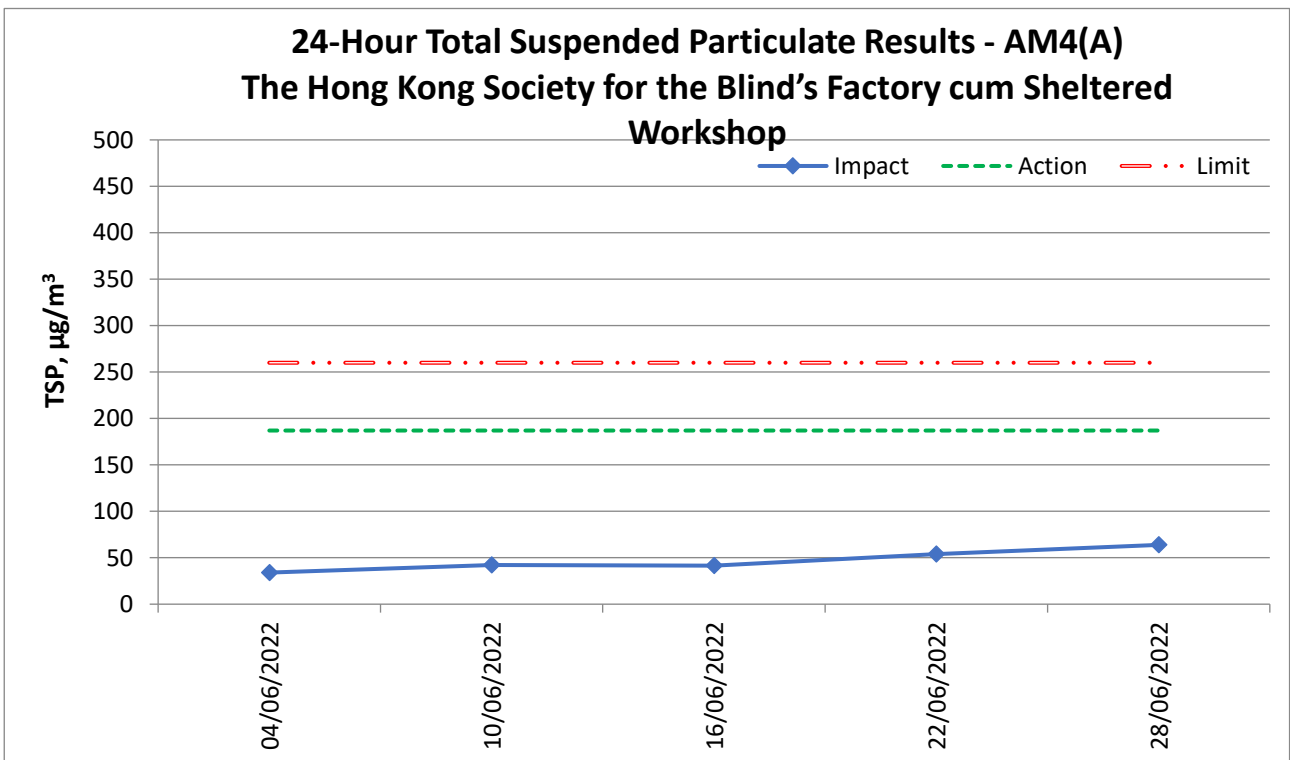
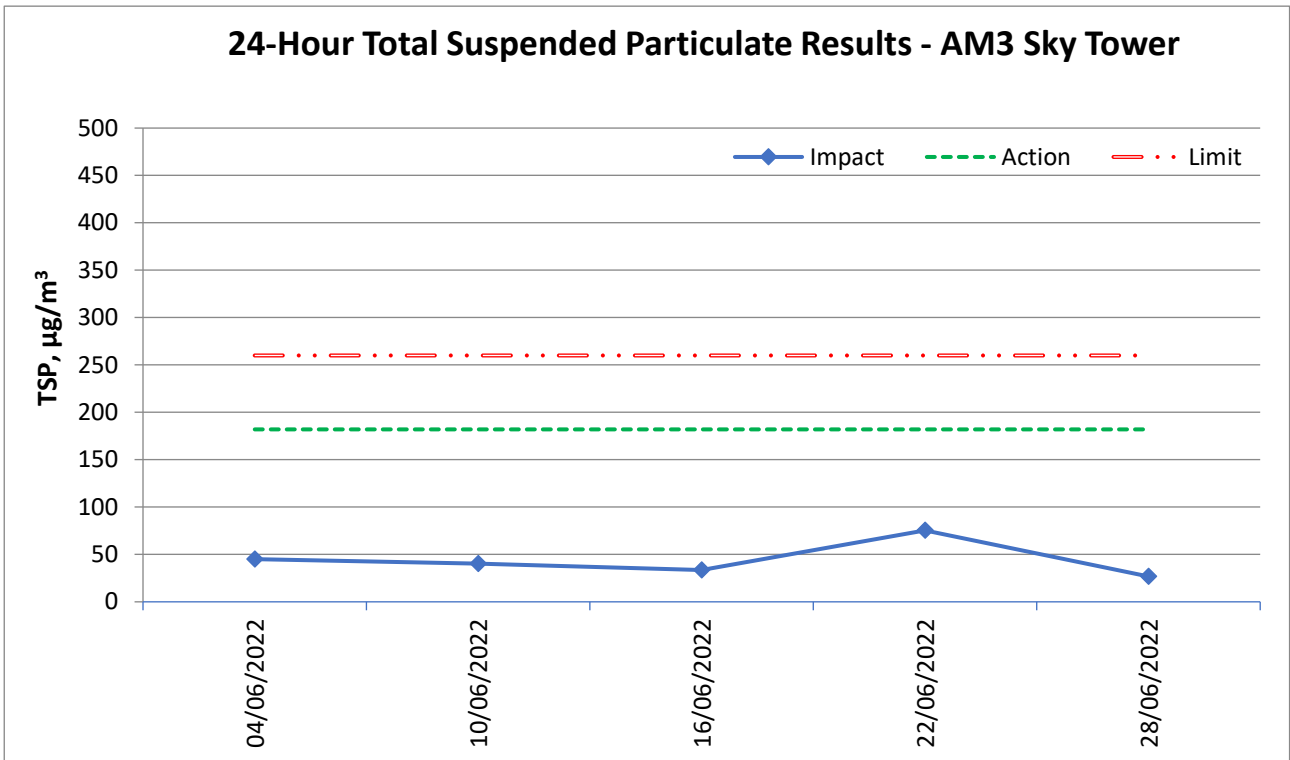
Location: AM4(A) – The Hong Kong Society for the Blind’s Factory cum Sheltered Workshop

Start Date	Weather	Air Temp. (°C)	Atmospheric Pressure (hPa)	Filter weight (g)		Particulate weight (g)	Elapse Time		Sampling Time (min)	Flow Rate (cfm)		Av. Flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
				Initial	Final		Initial	Final		Initial	Final			
04/06/2022	Cloudy	31.1	1005.8	15.2185	15.2846	0.0661	3932.77	3956.79	1441	50	50	1.35	1943	34
10/06/2022	Cloudy	27.3	1005.4	18.5221	18.6045	0.0824	3957.37	3981.39	1441	50	50	1.36	1954	42
16/06/2022	Cloudy	30.9	1008.9	15.1744	15.2552	0.0808	3982.12	4006.13	1441	50	50	1.35	1945	42
22/06/2022	Sunny	30.5	1009.6	15.5383	15.6433	0.1050	4007.82	4031.83	1441	50	50	1.35	1947	54
28/06/2022	Sunny	32.9	1005.1	15.7714	15.8950	0.1236	4032.22	4056.24	1441	50	50	1.34	1936	64
													Maximum	64
													Minimum	34
													Average	47
													Action Level	187
													Limit Level	260

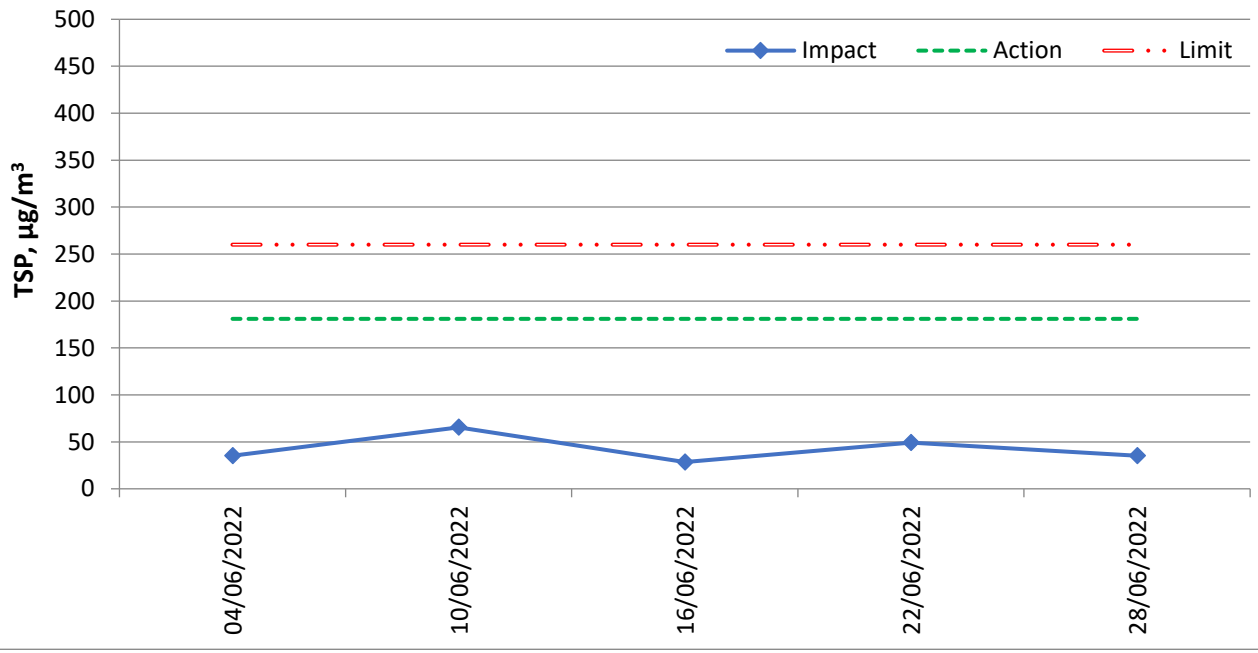
Location: AM7 – Hong Kong Children’s Hospital

Start Date	Weather	Air Temp. (°C)	Atmospheric Pressure (hPa)	Filter weight (g)		Particulate weight (g)	Elapse Time		Sampling Time (min)	Flow Rate (cfm)		Av. Flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
				Initial	Final		Initial	Final		Initial	Final			
04/06/2022	Cloudy	31.1	1005.8	19.1672	19.2371	0.0699	9137.31	9161.32	1441	50	50	1.38	1986	35
10/06/2022	Cloudy	27.3	1005.4	18.2069	18.3376	0.1307	9161.46	9185.47	1441	50	50	1.39	1998	65
16/06/2022	Cloudy	30.9	1008.9	15.2169	15.2736	0.0567	9185.61	9209.62	1441	50	50	1.38	1989	29
22/06/2022	Sunny	30.5	1009.6	18.4345	18.5328	0.0983	9210.78	9234.79	1441	50	50	1.38	1991	49
28/06/2022	Sunny	32.9	1005.1	15.2216	15.2912	0.0696	9235.15	9259.17	1441	50	50	1.37	1980	35
												Maximum	65	
												Minimum	29	
												Average	43	
												Action Level	181	
												Limit Level	260	

24-hour average TSP



### 24-Hour Total Suspended Particulate Results - AM7 Hong Kong Children's Hospital



**Appendix H – 1-hr TSP monitoring results and graphical presentation**

Location:  
**AM3 -  
 Sky Tower**

Date	Measurement Period			1-hr TSP concentration, $\mu\text{g}/\text{m}^3$	Weather
04/06/2022	13:00	-	14:00	37	Cloudy
	14:00	-	15:00	38	
	15:00	-	16:00	37	
10/06/2022	13:00	-	14:00	27	Cloudy
	14:00	-	15:00	32	
	15:00	-	16:00	33	
16/06/2022	9:00	-	10:00	25	Cloudy
	10:00	-	11:00	28	
	11:00	-	12:00	28	
22/06/2022	13:00	-	14:00	80	Sunny
	14:00	-	15:00	84	
	15:00	-	16:00	86	
28/06/2022	9:00	-	10:00	41	Sunny
	10:00	-	11:00	43	
	11:00	-	12:00	44	
Maximum				86	
Minimum				25	
Average				44	
Action Level				297	
Limit Level				500	



Location:  
**AM4(A) -  
The Hong Kong  
Society for the  
Blind's Factory  
cum Sheltered  
Workshop**

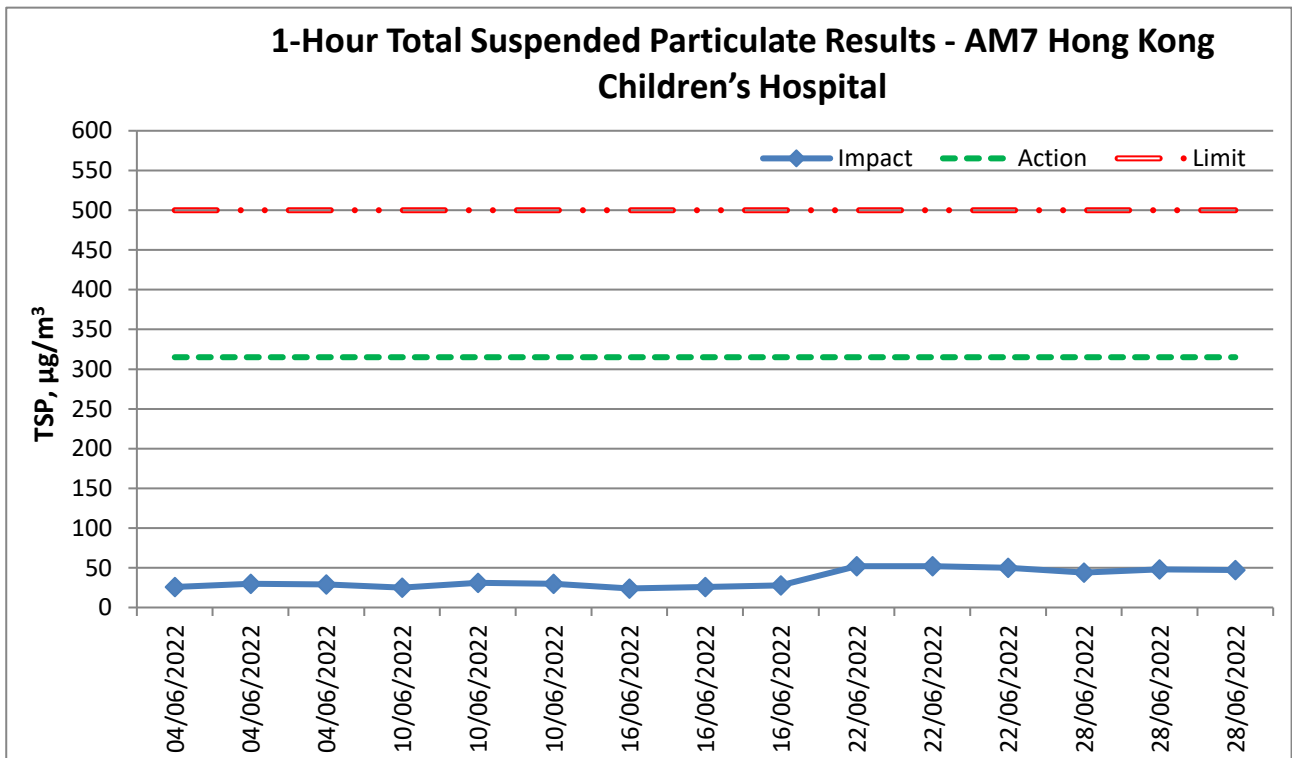
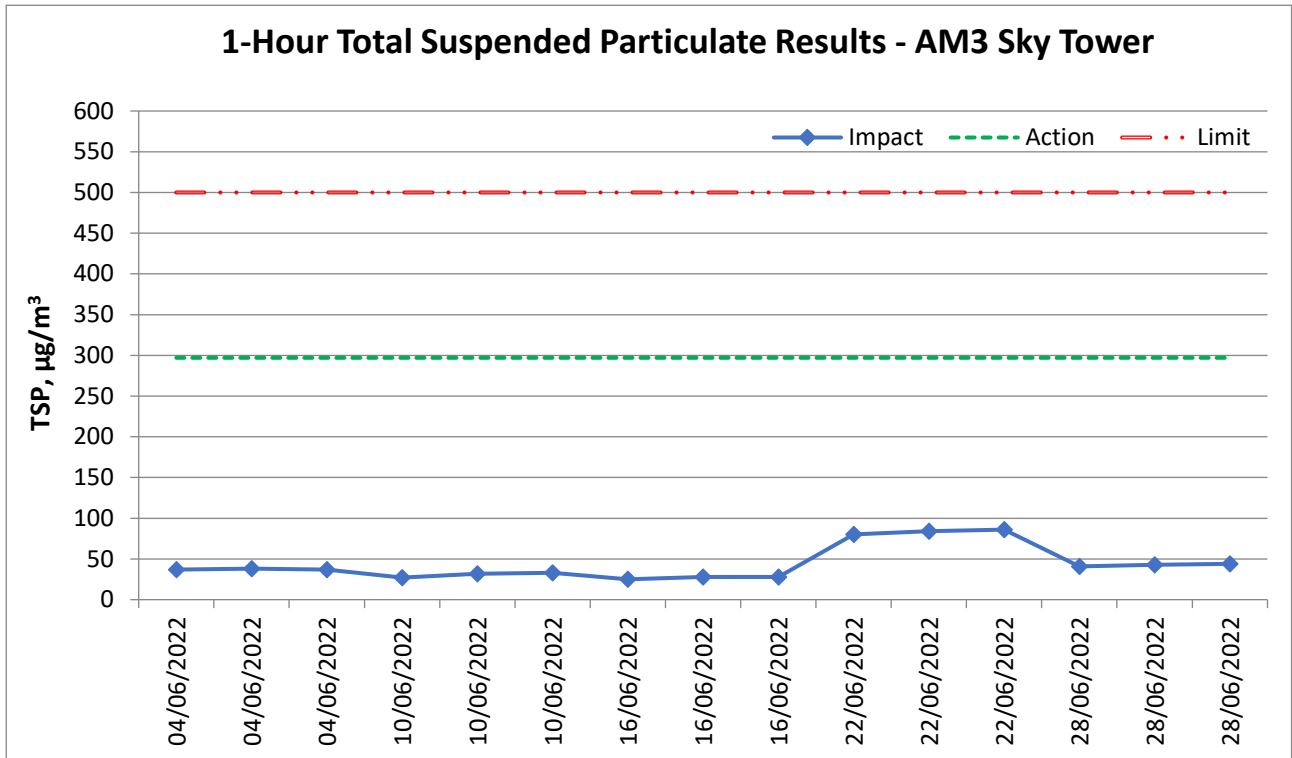
Date	Measurement Period			1-hr TSP concentration, $\mu\text{g}/\text{m}^3$	Weather
		-			
04/06/2022	9:00	-	10:00	31	Cloudy
	10:00	-	11:00	33	
	11:00	-	12:00	33	
10/06/2022	9:00	-	10:00	29	Cloudy
	10:00	-	11:00	34	
	11:00	-	12:00	32	
16/06/2022	13:00	-	14:00	34	Cloudy
	14:00	-	15:00	37	
	15:00	-	16:00	37	
22/06/2022	13:00	-	14:00	73	Sunny
	14:00	-	15:00	76	
	15:00	-	16:00	73	
28/06/2022	9:00	-	10:00	58	Sunny
	10:00	-	11:00	60	
	11:00	-	12:00	62	
Maximum				76	
Minimum				29	
Average				47	
Action Level				326	
Limit Level				500	

Location:  
**AM7 -  
 Hong  
 Children's  
 Hospital**

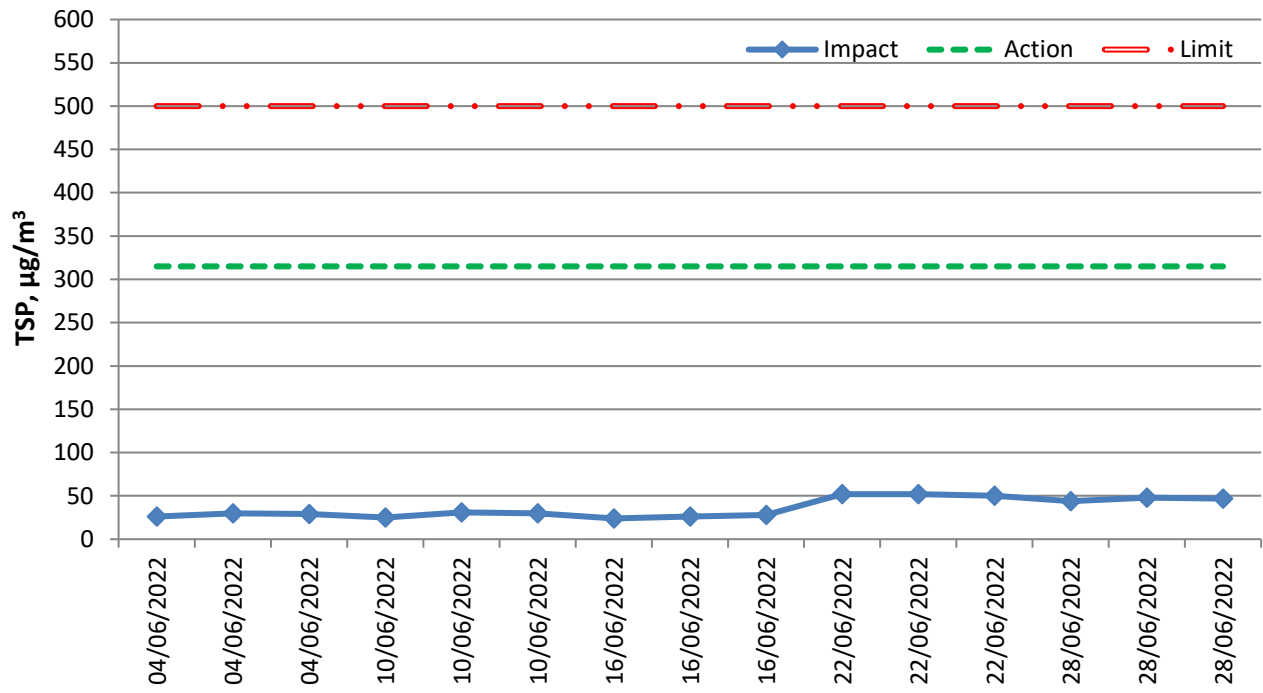
**Kong**

Date	Measurement Period			1-hr TSP concentration, μg/m <sup>3</sup>	Weather
		-			
04/06/2022	13:00	-	14:00	26	Sunny
	14:00	-	15:00	30	
	15:00	-	16:00	29	
10/06/2022	13:00	-	14:00	25	Cloudy
	14:00	-	15:00	31	
	15:00	-	16:00	30	
16/06/2022	9:00	-	10:00	24	Sunny
	10:00	-	11:00	26	
	11:00	-	12:00	28	
22/06/2022	9:00	-	10:00	52	Cloudy
	10:00	-	11:00	52	
	11:00	-	12:00	50	
28/06/2022	13:00	-	14:00	44	Cloudy
	14:00	-	15:00	48	
	15:00	-	16:00	47	
Maximum				52	
Minimum				24	
Average				36	
Action Level				315	
Limit Level				500	

**1-hour average TSP**



### 1-Hour Total Suspended Particulate Results - AM7 Hong Kong Children's Hospital



**Appendix I – Event and Action Plan for air quality**

Event	Action			
	ET	IEC	Supervisor / ER	Contractor
Action Level being exceeded by one sampling	<ol style="list-style-type: none"> <li>1. Identify source and investigate the causes of exceedance;</li> <li>2. Inform Contractor, IEC and Supervisor /ER;</li> <li>3. Repeat measurement to confirm finding.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Rectify any unacceptable practice;</li> <li>2. Amend working methods if appropriate.</li> </ol>
Action Level being exceeded by two or more consecutive sampling	<ol style="list-style-type: none"> <li>1. Identify source and investigate the causes of exceedance;</li> <li>2. Inform Contractor, IEC and Supervisor /ER;</li> <li>3. Increase monitoring frequency to daily;</li> <li>4. Discuss with IEC and Contractor on remedial actions required;</li> <li>5. Assess the effectiveness of Contractor's remedial actions;</li> <li>6. If exceedance continues, arrange meeting with IEC and Supervisor /ER;</li> <li>7. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss with ET and Contractor on possible remedial measures;</li> <li>4. Advise the Supervisor /ER on the effectiveness of the proposed remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>4. Supervise implementation of remedial measures;</li> <li>5. Conduct meeting with ET and IEC if exceedance continues.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with ET and IEC on proper remedial actions;</li> <li>2. Submit proposals for remedial actions to Supervisor /ER and IEC within three working day of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Amend proposal if appropriate.</li> </ol>
Limit Level being exceeded by one sampling	<ol style="list-style-type: none"> <li>1. Identify source and investigate the causes of exceedance;</li> <li>2. Inform Contractor, IEC, Supervisor /ER, and EPD;</li> <li>3. Repeat measurement to confirm finding;</li> <li>4. Assess effectiveness of</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss possible remedial measures with ET and Contractor;</li> <li>4. Advise the Supervisor /ER</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Discuss with ET and IEC on proper remedial actions;</li> <li>3. Submit proposal for remedial actions to Supervisor /ER and IEC</li> </ol>



Event	Action			
	ET	IEC	Supervisor / ER	Contractor
	Contractor's remedial actions and keep EPD, IEC and Supervisor /ER informed of the results.	on the effectiveness of the proposed remedial measures.	4. Supervise implementation of remedial measures; 5. Conduct meeting with ET and IEC if exceedance continues.	within three working days of notification; 4. Implement the agreed proposals.
Limit Level being exceeded by two or more consecutive sampling	<ol style="list-style-type: none"> <li>1. Notify IEC, Supervisor /ER, Contractor and EPD;</li> <li>2. Repeat measurement to confirm findings;</li> <li>3. Carry out analysis of Contractor's working procedures to identify source and investigate the causes of exceedance;</li> <li>4. Increase monitoring frequency to daily;</li> <li>5. Arrange meeting with IEC, Supervisor /ER and Contractor to discuss the remedial action to be taken;</li> <li>6. Assess effectiveness of Contractor's remedial actions and keep EPD, IEC and Supervisor /ER informed of the results;</li> <li>7. If exceedance stop, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss with Supervisor /ER, ET, and Contractor on the potential remedial actions;</li> <li>4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the Supervisor /ER accordingly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>4. Supervise implementation of remedial measures;</li> <li>5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Discuss with ET and IEC on proper remedial actions;</li> <li>3. Submit proposal for remedial actions to Supervisor /ER and IEC within three working days of notification;</li> <li>4. Implement the agreed proposals;</li> <li>5. Submit further remedial actions if problem still not under control;</li> <li>6. Stop the relevant portion of works as instructed by the Supervisor /ER until the exceedance is abated.</li> </ol>

# **Appendix J – Calibration certificates, catalogue of noise monitoring equipment**

# Catalogue of Sound Level Meter

## Specifications

	NL-52	NL-42
Applicable standards	IEC 61672-1: 2002 Class 1 ANSI S1.4-1983 Type 1 ANSI S1.4A-1985 Type 1 ANSI S1.43-1997 Type 1 JIS C 1509-1: 2005 Class 1	IEC 61672-1: 2002 Class 2 ANSI S1.4-1983 Type 2 ANSI S1.4A-1985 Type 2 ANSI S1.43-1997 Type 2 JIS C 1509-1: 2005 Class 2
Measurement functions	Simultaneous measurement of the following items, with selected time weighting and frequency weighting WEEE Directives, Chinese RoHS (export model for China only)	
Processing (main ch)	Instantaneous sound pressure level: $L_p$ Equivalent continuous sound pressure level: $L_{eq}$ Sound exposure level: $L_E$ Maximum sound pressure level: $L_{max}$ Minimum sound pressure level: $L_{min}$ Percentage sound levels: $L_N$ (0.1 to 99.9%, 0.1-increment steps, max. 5 values)	
Processing (sub ch)	Instantaneous sound pressure level: $L_p$	
Additional processing	In addition to main processing items, one of the following can be selected for simultaneous processing: C-weighted equivalent continuous sound level: $L_{Ceq}$ C-weighted peak sound level: $L_{Cpeak}$ Z-weighted peak sound level: $L_{Zpeak}$ 1-time-weighted equivalent continuous sound level: $L_{A1eq}^{*2}$ Maximum 1-time-weighted equivalent continuous sound level: $L_{A1max}^{*2}$ The power average of the maximum level of each 5 second interval: $L_{A1a5}$ The frequency weighting for the additional processing synchronizes with the frequency weighting of the sub-channel, so when the sub-channel has A-weighting, $L_{A1a5}$ can be selected. When C-weighting (Z-weighting) is selected, the additional processing $L_{Ceq}$ and $L_{Cpeak}$ ( $L_{Zpeak}$ ) are selectable.	
Measuring time	10 s, 1, 5, 10, 15, 30 m, 1, 8, 24 h, and manual (maximum 24 h)	
Microphone	Type UC-59 UC-52 Sensitivity level -27 dB -33 dB	
Measurement range	A-weighting: 25 dB to 138 dB C-weighting: 33 dB to 138 dB Z-weighting: 38 dB to 138 dB C-weighting peak sound level: 55 dB to 141 dB Z-weighting peak sound level: 60 dB to 141 dB	
Inherent noise	A-weighting 17 dB or less C-weighting 25 dB or less Z-weighting 30 dB or less	19 dB or less 27 dB or less 32 dB or less
Frequency range	20 Hz to 20 kHz	20 Hz to 8 kHz
Frequency weighting	A, C, and Z	
Time weighting	F (Fast) and S (Slow)	
Level range	Single range (Linearity range: 113 dB) Bar graph display range max. Max. 110 dB (20 to 130 dB) Switching of bar graph display Set the upper/lower limit in 10 dB increments.	
RMS detection circuit	Digital processing method	
Sampling cycle	20.8 $\mu$ s ( $L_p$ , $L_{eq}$ , $L_E$ , $L_{max}$ , $L_{min}$ , $L_{peak}$ : sampling frequency: 48 kHz) 100 ms ( $L_N$ )	
Calibration	Measurement Law: electrical calibration performed according to IEC and JIS standards, using internally generated signals; acoustic calibration performed with the NC-74.	
Correction functions	Windscreen correction: Compliant with IEC 61672-1 and JIS C 1509-1 standards when the windscreen is installed. Diffuse sound field correction: Correction of frequency characteristics in order to comply with standards (ANSI S1.4) in diffuse sound field.	
Delay time	The meter can be set to start measuring a specified time (OFF, 1, 3, 5 or 10 s) after the start button has been pressed or when a user-set trigger is exceeded.	
Back erase function	When the PAUSE key is pressed to pause measurement, the preceding (user selectable) 0, 1, 3 or 5 s data are excluded from processing.	
Display	Backlit semitransparent color TFT LCD display WQVGA (400 x 240 dots) * LCD with touch panel (Capacitive Touch Panel) Numerical display update frequency: 1 s Bar graph update frequency: 100 ms	
Store	Manual Number of data Internal memory: max. 1000 sets SD Card: depends on the capacity of the SD Card*1	Auto*2 Instantaneous values ( $L_p$ mode) and processed values ( $L_{eq}$ mode) are stored continuously and automatically at preset intervals. LP sampling cycle 100 ms, 200 ms, 1 s, $L_{eq}$ 1s Leq sampling cycle 10 s, 1, 5, 10, 15, 30 ms, 1, 8, 24 h Measurement Time Max. 1000 h (depends on the capacity of the SD Card)*1

\* Windows is a trademark of Microsoft Corporation.  
\* Specifications subject to change without notice.

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1011-4 212 P.D

Data recall	Allows viewing of stored data
Setup memory	Up to five setup configurations can be saved in internal memory, for later recall Start up via file settings previously stored on SD card possible
Waveform recording*3	
File format	Uncompressed waveform WAVE file
Sampling frequency	Select 48 kHz, 24 kHz or 12 kHz
Data length	Select 24 bit or 16 bit
Outputs	
DC output	Output DC signals using a frequency weighting characteristic selected by processing
Output voltage	2.5 V, 25 mV / dB at bar graph display full scale
AC output	Output AC signals using a frequency weighting characteristic selected by processing or by A, C, Z-weighting.
Output voltage	1 V (rms values) at bar graph display full scale
Comparator output*2	Turns on when the open-collector output exceeds the set value (max. applied voltage 24 V, max. current 60 mA, allowable dissipation 300 mW).
USB*2	Allows USB to be connected to a computer and recognized as a removable disk Allows USB to be controlled via communication commands
RS-232C communication	Allows for RS-232C communication via use of a dedicated cable
Data continuous output*2	
Type of data	Instantaneous value $L_p$ Processed value $L_{eq}$ , $L_{max}$ , $L_{min}$ , $L_{peak}$
Output interval	100 ms
Print out	Printing of measurement results on dedicated printer DPU-414
Power requirements	Four IEC R6 (size AA) batteries (alkaline or rechargeable batteries) or external power supply
Battery life (23 °C)	Alkaline battery LR6 (AA): 26 h Ni-MH secondary battery: 25 h At the maximum: * Depends on the setting
AC adapter	NC-98C (NC-34 for previous models cannot be used)
External power voltage	5 to 7 V (rated voltage: 6 V)
Current consumption	Approximately 90 mA (normal operation, rated voltage)
Ambient conditions	Temperature: -10 to +50 °C Humidity: 10 to 90% RH (non-condensing)
Dustproof / water-resistant performance*4	IP code: IP54 (except for microphone) See precautions regarding waterproofing
Dimensions, weight	Approx. 250 (H) x 76 (W) x 33 mm(D), approx. 400 g (with batteries)
Supplied accessories	Storage case x 1, Windscreen WS-10 x 1, Windscreen fall prevention rubber x 1, Hand strap x 1, LR6 (AA) alkaline batteries x 4, SD card 512 MB x 1 (NX-42EX preinstalled model only)

## Options

	Product name	Product number
Extended function program (Inst. on 512 MB SD card)		NX-42EX
Waveform recording program*2 (Inst. on 2 GB SD card)		NX-42WR
Octave, 1/3 octave real-time analysis program*2 (Inst. on 512 MB SD card)		NX-42RT
FFT analysis program*2 (Inst. on 512 MB SD card)		NX-42FT
Data management software for environmental measurement		AS-60
Data management software for environmental measurement (Includes the octave and 1/3 octave data management software)		AS-60RT
Data management software for environmental measurement (Includes the vibration level data management software)		AS-60VM
Waveform analysis software		CAT-WAVE
SD Card 512 MB		SD-512M
SD Card 2 GB		SD-2G
AC adapter (100 V to 240 V)		NC-98C
Battery pack		BP-21
Microphone extension cables		EC-04 (from 2 m)
BNC-Pin output code		CC-24
Comparator output cable		CC-42C
Printer		DPU-414
Printer cable		CC-42P
RS 232C serial I/O cable		CC-42R
USB cable		—
Sound calibrator		NC-74
All-weather windscreen		WS-15
Windscreen mounting adapter		WS-15006
Rain-protection windscreen		WS-16
Sound level meter tripod		ST-80
All-weather windscreen tripod		ST-81

\*1 Use Rion fully guaranteed products. \*2 NX-42EX required (sold separately). \*3 NX-42WR required (sold separately).  
\*4 Protection against harmful dust and water splashing from any direction.

### Precautions regarding waterproofing

Before use, verify that the rubber bottom cover and the battery compartment lid are firmly closed.  
To maintain the water and dust proof rating, internal packing replacement is required every two years (at cost).



**RION CO., LTD.**  
http://www.rion.co.jp/english/

3-20-41, Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan  
Tel: +81-42-359-7888 Fax: +81-42-359-7442

# Calibration Certificate of Sound Level Meter

AAST-SLM-10  
Cal Cert: 2021/7/19



**中国赛宝实验室计量检测中心**  
(工业和信息化部电子第五研究所计量检测中心)  
CHINA CEPREI LABORATORY CALIBRATION & TESTING CENTRE

## 校准证书 CALIBRATION CERTIFICATE

证书编号: 2HB21001383-0001  
Certificate No.



委托单位: Client	Castco Testing Centre Limited	
仪器名称: Description	Sound Level Meter	
型号规格: Model/Type	NL-52	
制造商: Manufacturer	RION	
机身号: Serial No.	00976203	
管理号: Asset No.	AAST-SLM-10	
接收日期: Rec. Date	2021-07-08	校准日期: Cal. Date
签发日期: App. Date	2021-07-19	建议校准周期: Reference Cal. Period
结论: Conclusion	所校准项目合格(Passed at Calibration Items)	

校准:  
Calibrated by **陈卓辉**

签发:  
Approved by **郑木力**

检验:  
Inspected by **张毅**

印章:  
Stamp

赛宝计量检测中心  
广州总部地址: 广州市增城区朱村街朱村大道西78号  
客服电话: 020-87237633 传真: 020-87236189  
投诉电话: 020-87236896  
邮件: cal@ceprei.com  
网址: www.ceprei-cal.com

CEPREI Calibration and Testing Centre  
HQ Addr: No.78.Zhucun Avenue West,Zengcheng District,Guangzhou,China  
Service Tel: 020-87237633 Fax: 020-87236189  
Complaint Tel: 020-87236896  
Email: cal@ceprei.com  
Website: www.ceprei-cal.com

证书编号(Certificate No.): 2HB21001383-0001

## 说明 DIRECTIONS

1. 本机构质量管理体系符合ISO/IEC 17025:2017标准的要求, 获得中国合格评定国家认可委员会(CNAS) 认可, 认可证书号为: CNAS L13344.  
This laboratory quality management system meets the ISO/IEC 17025:2017 and is accredited by the China National Accreditation Service for Conformity Assessment, No. CNAS L13344.
2. 本次校准的技术依据及CNAS认可范围(Reference documents and CNAS accredited scopes):  
\* JJG 188-2017 声级计检定规程; Sound pressure level; (20~130)dB; Frequency Weighting: (20~130)dB@(10 Hz~20kHz).  
\* 详细内容请查看CNAS网站中注册编号为L13344的证书附件, 超出范围的内容未被认可, 其结果/结论所依据的合格评定活动不在认可范围内。(Please see the attachment of certificate No. L13344 at CNAS website for details, beyond which is not accredited, the conformity assessment activities on which the results/conclusions are based are outside the scope of accreditation.)
3. 本次校准所使用的主要测量标准(The main measurement standards used during the calibration):  

名称 (Description)	证书号/有效期/溯源单位 (Certificate No./Due Date/Traceability to)	技术指标 (Specification)	测量范围 (Measuring Range)
正弦信号发生器	4GC20000427-0010/2021-11-04/赛宝(广州)	f: ±1mHz; 失真度 Distortion: <-70dB	f: 0.001Hz~200kHz; ; 100μV~5Vrms
数字多用表	4GC20000358-0060/2021-09-09/赛宝(广州)	DCV: ±0.035%; ACV: ± 0.06%; DCI: ±0.05%; ACI : ±0.1%; R: ±0.01%; f: ±0.001%	DCV: 40~1000V; ACV (0.001~750V@(3Hz~ 300kHz); DCI: 40~3A ; ACI: 40~3A@(3Hz~ 5kHz); R: 40~100)MΩ ; E3Hz~300kHz
步进衰减器	4GC21000155-0024/2022-04-29/赛宝(广州)	±3dB	(0~110) dB/10dB step @DC~1GHz
PULSE分析系统	GFJGJL1001210202725/2022-03-03/航空 304所	频率: U <sub>rel</sub> =0.001%, k=2; 电压: U <sub>rel</sub> =0.04%, k=2	频率: 0.001Hz~51.2kHz; 电压: 1×10 <sup>-3</sup> ~30V
标准声声器	LSsx2021-13180/2022-04-24/中国计量院	U=(0.05~0.20)dB (k=2)	20Hz~20kHz
前置放大器	LSsx2021-11346/2022-03-07/中国计量院	U=0.34dB (k=2)	(10~20000) Hz
功率放大器	4GC20000457-0065/2021-11-17/赛宝(广州)	频率响应: ±1dB, 失真度 : ≤0.2%	20Hz~20kHz
多功能声学校准器	4EC20000091-0005/2021-11-05/赛宝(广州)	1级	31.5Hz~16kHz
4. 校准地点(The calibration place):  
广州市增城区朱村街朱村大道西78号9栋110室
5. 环境条件(Environmental conditions):  
温度(Temperature): 23.4°C 相对湿度(Relative Humidity): 55.8%
6. 本证书中给出的扩展不确定度依据JJF1059.1-2012《测量不确定度的评定与表示》评定, 由合成标准不确定度乘以包含概率约为95%时对应的包含因子k得到。  
The extended uncertainty given in this certificate is evaluated according to JJF1059.1-2012 "Evaluation and Expression of Uncertainty in Measurement", and is calculated by multiplying the combined standard uncertainty by the coverage factor k which corresponding to the coverage probability about 95%.
7. 证书中"P"、"合格"代表"测量结果在允许范围内", "F"、"不合格"代表"测量结果不在允许范围内", "N/A"代表"不适用或技术指标暂时无法确认等"。本证书报告的结论仅供参考, 使用人员应结合实际测量的要求合理使用, 如考虑测量结果测量不确定度的影响等。  
"P" and "Pass" in this certificate stand for "Low Limit: the measured value ≤ High Limit", "F" and "Fail" stand for "the measured value < Low Limit or the measured value > High Limit", "N/A" stands for "Not Applicable or the technical specification has not been confirmed etc". The conclusions of this certificate are for reference only. Users should use them reasonably according to the actual measurement requirements, such as considering the impact of measurement uncertainty, etc.
8. 建议校准周期是依据本证书报告的技术依据和仪器设备常规使用条件给出的建议, 供委托方参考。委托方可以根据实际使用情况自行决定样品的校准周期。



# Calibration Certificate of Sound Level Meter



证书编号(Certificate No.): 2HB21001383-0001

### 1 外观与工作正常性检查 (Appearance and Function Check)

无影响证书中测量结果准确度的因素和缺陷。

There are no factor and defect that affect the measurement result accuracy of the certificate.

### 2 指示声级调整 (Indication SPL Calibration)

频率(Frequency)=1000Hz

传声器型号 (Microphone Type)	传声器编号 (Microphone SN.)	放大器型号 (Preamplifier Type)	放大器编号 (Preamplifier SN.)
UC-59	15764	NH-25	76321

声校准器型号 (Calibrator Type)	标准声压级 (Reference SPL) (dB)	校准前示值 (Before Calibration) (dB)	校准后示值 (After Calibration) (dB)	U (k=2) (dB)
4226	94.0	94.1	94.1	0.2

### 3 级线性 (Level Linearity)

#### 3.1 参考级量程 (Reference Range)

频率(Frequency): 8000Hz

起始点指示声级(Sound Level Indication of Start Point):	90.0 dB
起始点以上间隔10dB点的最大误差(Maximum Error for each 10dB above Start Point):	-0.2 dB
U (k=2)	0.6 dB
上限以下5dB间隔1dB点的最大误差(Maximum Error for each 1dB below Upper Limit 5dB):	-0.2 dB
U (k=2)	0.6 dB
起始点以下间隔10dB点的最大误差(Maximum Error for each 10dB below Start Point):	-0.2 dB
U (k=2)	0.6 dB
下限以上5dB间隔1dB点的最大误差(Maximum Error for each 1dB above Lower Limit 5dB):	-0.2 dB
U (k=2)	0.6 dB

#### 3.2 其它级量程 (Other Range)

频率(Frequency): 1000Hz

起始点指示声级(Sound Level Indication of Start Point):	90.0 dB
起始点以上间隔10dB点的最大误差(Maximum Error for each 10dB above Start Point):	-0.1 dB
U (k=2)	0.4 dB
上限以下5dB间隔1dB点的最大误差(Maximum Error for each 1dB below Upper Limit 5dB):	-0.1 dB
U (k=2)	0.4 dB
起始点以下间隔10dB点的最大误差(Maximum Error for each 10dB below Start Point):	-0.1 dB
U (k=2)	0.4 dB
下限以上5dB间隔1dB点的最大误差(Maximum Error for each 1dB above Lower Limit 5dB):	-0.1 dB
U (k=2)	0.4 dB

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证书编号(Certificate No.): 2HB21001383-0001

### 4 A计权特性(A-Weighting Characteristic)

频率 (Frequency) (Hz)	实测值 (Actual) (dB)	理论值 (Theoretical value) (dB)	误差 (Error) (dB)	允许误差 (Limit) (dB)	结论 (Pass/Fail) (P/F)	U (k=2) (dB)
20	-49.2	-50.5	1.3	±2.0	P	0.5
25	-44.2	-44.7	0.5	+2.0 ~ -1.5	P	0.5
31.5	-39.4	-39.4	0.0	±1.5	P	0.5
40	-34.4	-34.6	0.2	±1.0	P	0.5
50	-30.3	-30.2	-0.1	±1.0	P	0.5
63	-26.0	-26.2	0.2	±1.0	P	0.5
80	-22.4	-22.5	0.1	±1.0	P	0.5
100	-19.1	-19.1	0.0	±1.0	P	0.5
125	-16.0	-16.1	0.1	±1.0	P	0.5
160	-13.2	-13.4	0.2	±1.0	P	0.5
200	-10.8	-10.9	0.1	±1.0	P	0.5
250	-8.6	-8.6	0.0	±1.0	P	0.5
315	-6.6	-6.6	0.0	±1.0	P	0.4
400	-4.7	-4.8	0.1	±1.0	P	0.4
500	-3.3	-3.2	-0.1	±1.0	P	0.4
630	-1.9	-1.9	0.0	±1.0	P	0.4
800	-0.8	-0.8	0.0	±1.0	P	0.4
1000(Ref.)	0.0	0.0	0.0	±0.7	P	0.4
1250	0.5	0.6	-0.1	±1.0	P	0.6
1600	0.9	1.0	-0.1	±1.0	P	0.6
2000	1.1	1.2	-0.1	±1.0	P	0.6
2500	1.0	1.3	-0.3	±1.0	P	0.6
3150	0.9	1.2	-0.3	±1.0	P	0.6
4000	1.2	1.0	0.2	±1.0	P	0.6
5000	0.3	0.5	-0.2	±1.5	P	0.6
6300	-0.3	-0.1	-0.2	+1.5 ~ -2.0	P	0.6
8000	-0.6	-1.1	0.5	+1.5 ~ -2.5	P	0.6
10000	-2.4	-2.5	0.1	+2.0 ~ -3.0	P	0.6
12500	-4.3	-4.3	0.0	+2.0 ~ -5.0	P	1.0
16000	-8.5	-6.6	-1.9	+2.5 ~ -16.0	P	1.0
20000	-18.5	-9.3	-9.2	+3.0 ~ -∞	P	1.0

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## Calibration Certificate of Sound Level Meter



证书编号(Certificate No.): 2HB21001383-0001

### 5 计权特性(C-Weighting Characteristic)

频率 (Frequency)	实测值 (Actual)	理论值 (Theoretical value)	误差 (Error)	允许误差 (Limit)	结论 (Pass/Fail)	U (dB)
20	-6.6	-6.2	-0.4	±2.0	P	0.5
25	-4.5	-4.4	-0.1	+2.0 ~ -1.5	P	0.5
31.5	-2.9	-3.0	0.1	±1.5	P	0.5
40	-1.9	-2.0	0.1	±1.0	P	0.5
50	-1.3	-1.3	0.0	±1.0	P	0.5
63	-0.7	-0.8	0.1	±1.0	P	0.5
80	-0.5	-0.5	0.0	±1.0	P	0.5
100	-0.2	-0.3	0.1	±1.0	P	0.5
125	-0.1	-0.2	0.1	±1.0	P	0.5
160	-0.1	-0.1	0.0	±1.0	P	0.5
200	0.0	0.0	0.0	±1.0	P	0.5
250	0.0	0.0	0.0	±1.0	P	0.5
315	0.0	0.0	0.0	±1.0	P	0.4
400	0.1	0.0	0.1	±1.0	P	0.4
500	0.0	0.0	0.0	±1.0	P	0.4
630	0.0	0.0	0.0	±1.0	P	0.4
800	0.0	0.0	0.0	±1.0	P	0.4
1000(Ref.)	0.0	0.0	0.0	±0.7	P	0.4
1250	-0.1	0.0	-0.1	±1.0	P	0.6
1600	-0.2	-0.1	-0.1	±1.0	P	0.6
2000	-0.3	-0.2	-0.1	±1.0	P	0.6
2500	-0.6	-0.3	-0.3	±1.0	P	0.6
3150	-0.8	-0.5	-0.3	±1.0	P	0.6
4000	-0.6	-0.8	0.2	±1.0	P	0.6
5000	-1.6	-1.3	-0.3	±1.5	P	0.6
6300	-2.1	-2.0	-0.1	+1.5 ~ -2.0	P	0.6
8000	-2.5	-3.0	0.5	+1.5 ~ -2.5	P	0.6
10000	-4.3	-4.4	0.1	+2.0 ~ -3.0	P	0.6
12500	-6.3	-6.2	-0.1	+2.0 ~ -5.0	P	1.0
16000	-10.5	-8.5	-2.0	+2.5 ~ -16.0	P	1.0
20000	-20.4	-11.2	-9.2	+3.0 ~ -∞	P	1.0

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证书编号(Certificate No.): 2HB21001383-0001

### 6 自生噪声 (Autogenous noise)

计权 (Weighting)	实测值 (Actual)
A	15.3

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# Calibration Certificate of Sound Level Meter


证书编号(Certificate No.): 2HB20001172-0004

1 外观与工作正常性检查 (Appearance and Function Check)  
 无影响证书中校准结果准确度的因素和缺陷。  
 There are no factor and defect that affect the calibration result accuracy of the certificate.

2 指示声级调整 (Indication SPL Calibration) 频率(Frequency)=1000Hz

传声器型号 (Microphone Type)	传声器编号 (Microphone SN.)	放大器型号 (Preamplifier Type)	放大器编号 (Preamplifier SN.)
UC-59	12133	NH-25	76321

声校准器型号 (Calibrator Type)	标准声压级 (Reference SPL) (dB)	校准前示值 (Before Calibration) (dB)	校准后示值 (After Calibration) (dB)	U (k=2) (dB)
4231	94.0	93.9	94.0	0.2

3 级线性 (Level Linearity)

3.1 参考级量程 (Reference Range) 频率(Frequency): 8000Hz

起始点指示声级(Sound Level Indication of Start Point): 90.0 dB

起始点以上间隔10dB点的最大误差(Maximum Error for each 10dB above Start Point): -0.1 dB  
 $U (k=2)$  0.6 dB

上限以下5dB间隔1dB点的最大误差(Maximum Error for each 1dB below Upper Limit 5dB): -0.1 dB  
 $U (k=2)$  0.6 dB

起始点以下间隔10dB点的最大误差(Maximum Error for each 10dB below Start Point): -0.1 dB  
 $U (k=2)$  0.6 dB

下限以上5dB间隔1dB点的最大误差(Maximum Error for each 1dB above Lower Limit 5dB): -0.1 dB  
 $U (k=2)$  0.6 dB

3.2 其它级量程 (Other Range) 频率(Frequency): 1000Hz

起始点指示声级(Sound Level Indication of Start Point): 90.0 dB


起始点以上间隔10dB点的最大误差(Maximum Error for each 10dB above Start Point): -0.2 dB  
 $U (k=2)$  0.4 dB

上限以下5dB间隔1dB点的最大误差(Maximum Error for each 1dB below Upper Limit 5dB): -0.2 dB  
 $U (k=2)$  0.4 dB

起始点以下间隔10dB点的最大误差(Maximum Error for each 10dB below Start Point): -0.1 dB  
 $U (k=2)$  0.4 dB

下限以上5dB间隔1dB点的最大误差(Maximum Error for each 1dB above Lower Limit 5dB): -0.1 dB  
 $U (k=2)$  0.4 dB

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证书编号(Certificate No.): 2HB20001302-0001

4 A计权特性(A-Weighting Characteristic)

频率 (Frequency) (Hz)	实测值 (Actual) (dB)	理论值 (Theoretical value) (dB)	误差 (Error) (dB)	允许误差 (Limit) (dB)	结论 (Pass/Fail) (P/F)	U (k=2) (dB)
20	-48.8	-50.5	1.7	±2.0	P	0.5
25	-44.1	-44.7	0.6	+2.0 ~ -1.5	P	0.5
31.5	-39.3	-39.4	0.1	±1.5	P	0.5
40	-34.4	-34.6	0.2	±1.0	P	0.5
50	-30.2	-30.2	0.0	±1.0	P	0.5
63	-26.2	-26.2	0.0	±1.0	P	0.5
80	-22.4	-22.5	0.1	±1.0	P	0.5
100	-19.1	-19.1	0.0	±1.0	P	0.5
125	-16.2	-16.1	-0.1	±1.0	P	0.5
160	-13.2	-13.4	0.2	±1.0	P	0.5
200	-10.8	-10.9	0.1	±1.0	P	0.5
250	-8.7	-8.6	-0.1	±1.0	P	0.5
315	-6.6	-6.6	0.0	±1.0	P	0.4
400	-4.8	-4.8	0.0	±1.0	P	0.4
500	-3.2	-3.2	0.0	±1.0	P	0.4
630	-1.9	-1.9	0.0	±1.0	P	0.4
800	-0.8	-0.8	0.0	±1.0	P	0.4
1000(Ref)	0.0	0.0	0.0	±0.7	P	0.4
1250	0.6	0.6	0.0	±1.0	P	0.6
1600	1.0	1.0	0.0	±1.0	P	0.6
2000	1.2	1.2	0.0	±1.0	P	0.6
2500	1.3	1.3	0.0	±1.0	P	0.6
3150	1.2	1.2	0.0	±1.0	P	0.6
4000	1.0	1.0	0.0	±1.0	P	0.6
5000	0.6	0.5	0.1	±1.5	P	0.6
6300	0.0	-0.1	0.1	+1.5 ~ -2.0	P	0.6
8000	-1.0	-1.1	0.1	+1.5 ~ -2.5	P	0.6
10000	-2.4	-2.5	0.1	+2.0 ~ -3.0	P	0.6
12500	-4.4	-4.3	-0.1	+2.0 ~ -5.0	P	1.0
16000	-8.0	-6.6	-1.4	+2.5 ~ -16.0	P	1.0
20000	-14.2	-9.3	-4.9	+3.0 ~ ∞	P	1.0

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数据页(Data sheet) ID: U071288

## Calibration Certificate of Sound Level Meter



证书编号(Certificate No.): 2HB20001302-0001

### 5 C计权特性(C-Weighting Characteristic)

频率 (Frequency) (Hz)	实测值 (Actual) (dB)	理论值 (Theoretical value) (dB)	误差 (Error) (dB)	允许误差 (Limit) (dB)	结论 (Pass/Fail) (P/F)	U (dB)
20	-6.3	-6.2	-0.1	±2.0	P	0.5
25	-4.5	-4.4	-0.1	+2.0 ~ -1.5	P	0.5
31.5	-3.2	-3.0	-0.2	±1.5	P	0.5
40	-2.0	-2.0	0.0	±1.0	P	0.5
50	-1.4	-1.3	-0.1	±1.0	P	0.5
63	-0.8	-0.8	0.0	±1.0	P	0.5
80	-0.5	-0.5	0.0	±1.0	P	0.5
100	-0.3	-0.3	0.0	±1.0	P	0.5
125	-0.2	-0.2	0.0	±1.0	P	0.5
160	-0.1	-0.1	0.0	±1.0	P	0.5
200	0.0	0.0	0.0	±1.0	P	0.5
250	0.0	0.0	0.0	±1.0	P	0.5
315	0.0	0.0	0.0	±1.0	P	0.4
400	0.0	0.0	0.0	±1.0	P	0.4
500	0.0	0.0	0.0	±1.0	P	0.4
630	0.0	0.0	0.0	±1.0	P	0.4
800	0.0	0.0	0.0	±1.0	P	0.4
1000(Ref.)	0.0	0.0	0.0	±0.7	P	0.4
1250	0.0	0.0	0.0	±1.0	P	0.6
1600	-0.1	-0.1	0.0	±1.0	P	0.6
2000	-0.2	-0.2	0.0	±1.0	P	0.6
2500	-0.3	-0.3	0.0	±1.0	P	0.6
3150	-0.5	-0.5	0.0	±1.0	P	0.6
4000	-0.8	-0.8	0.0	±1.0	P	0.6
5000	-1.2	-1.3	0.1	±1.5	P	0.6
6300	-1.9	-2.0	0.1	+1.5 ~ -2.0	P	0.6
8000	-2.9	-3.0	0.1	+1.5 ~ -2.5	P	0.6
10000	-4.3	-4.4	0.1	+2.0 ~ -3.0	P	0.6
12500	-6.4	-6.2	-0.2	+2.0 ~ -5.0	P	1.0
16000	-9.9	-8.5	-1.4	+2.5 ~ -16.0	P	1.0
20000	-16.2	-11.2	-5.0	+3.0 ~ ∞	P	1.0

数据页(Data sheet) ID: U071288

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Page of



证书编号(Certificate No.): 2HB20001302-0001

### 6 自生噪声 (Autogenous noise)

计权 (Weighting)	实测值 (Actual) (dB)
A	18.3

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Page of

数据页(Data sheet) ID: U071288

## Catalogue of Sound Calibrator

Sound Calibrator NC-75



Compact and lightweight sound calibrator allows highly reliable and accurate measurement anywhere

# Sound Calibrator NC-75

Patent pending



■ Integrated newly developed reference microphone enables feedback control that completely eliminates the need for atmospheric pressure and coupler volume correction, resulting in highly accurate and reliable calibration.

■ Effective coupler sound insulation (30 dB or higher\*) permits calibration also in relatively noisy environments.

\* A-weighted sound level insulation performance measured with pink noise

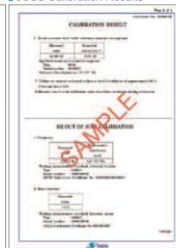
■ Each product comes standard with a JCSS Calibration Certificate, demonstrating high quality.

- Conforming with IEC 60942: 2017 class 1 and JIS C 1515: 2004 (Also complies with IEC 60942 Version 4 currently under revision)
- Supports calibration of RION sound level meters compliant with IEC 61672-1: 2013, JIS C 1509-1: 2017 and JIS C 1516: 2014.
- Supports calibration of RION microphones and microphones of other manufacturers meeting the size specifications of IEC 61094-4.
- Supports 1-inch, 1/2-inch, and 1/4-inch microphones (1/4 inch with optional adapter)

JCSS Calibration Certificate



JCSS Calibration Results



## Catalogue of Sound Calibrator



### How to use the adapter

#### ■ 1-inch microphones

To use the sound calibrator with 1-inch diameter microphones, remove the 1/2-inch microphone adapter.



#### ■ 1/2-inch microphones

To use the sound calibrator with 1/2-inch diameter microphones, the supplied 1/2-inch microphone adapter must be in place.



Make sure the 1/2-inch adapter is locked.

#### ■ 1/4-inch microphones

To use the sound calibrator with 1/4-inch diameter microphones, use the supplied 1/2-inch microphone adapter together with the optional 1/4-inch adapter.



Usage example

### Specifications (under standard ambient conditions\*)

Applicable standards	IEC 60942: 2017 class 1, ANSI/ASA S1.40-2008 class 1, JIS C 1515: 2004 class 1, CE marking, WEEE directive, Chinese RoHS
Supported microphones	Microphones made by RION and microphones made by other manufacturers that meet the IEC 61094-4 size specifications 1-inch microphones 1/2-inch microphones (with supplied adapter) 1/4-inch microphones (with optional adapter)
Nominal sound pressure level	94 dB
Sound pressure level tolerance	Max. ±0.20 dB
Nominal frequency	1,000 Hz
Frequency tolerance	Max. ±0.1%
THD + noise	Max. 1.0% (22.4 Hz to 22.4 kHz)
Dimensions and weight	Approx. 42 mm (H) x 77 mm (W) x 70 mm (D), approx. 200 g
Power supply	IEC LR6 (size AA) alkaline battery x 2 IEC LR6 (size AA) nickel-hydrate rechargeable battery ("enloop pro" supported) x 2
Battery life	50 hours or more (using two alkaline batteries, continuous use) 50 hours or more (using two nickel-hydrate rechargeable batteries [enloop pro], continuous use)
Supplied accessories	Soft case x 1, 1/2-inch microphone adapter x 1, IEC LR6 (size AA) alkaline battery x 2, hand strap x 1, JCSS Calibration Certificate x 1
Optional accessories	1/4-inch microphone adapter NC-75-S11

\* RION standard ambient conditions: static pressure 101.325 kPa, ambient temperature 23 °C, relative humidity 50 %

### Strap



Securely carry the unit with the supplied hand strap

### Soft case



Calibration can be performed with the calibrator inserted in the soft case

### PISTONPHONE NC-72A



### Specifications (under standard ambient conditions\*)

Applicable standards	IEC 60942: 2017 class L5/M, class 1/M, JIS C 1515: 2004 class L5/C, class 1/C
Nominal sound pressure level	114 dB, Sound pressure level tolerance ±0.10 dB



JCSS  
JCSS 6197

RION CO., LTD. is recognized by the JCSS which uses ISO/IEC 17025 as an accreditation standard and bases its accreditation scheme on ISO/IEC 17031. JCSS is operated by the accreditation body (A. Japan which is a signatory) (ILAC). The Quality Assurance Section of RION CO., LTD. is an international MRA compliant JCSS operator with the accreditation number JCSS 6197.

\* Windows is a trademark of Microsoft Corporation. \* Specifications subject to change without notice.

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**RION CO., LTD.**  
https://rion-sv.com/

3-20-41, Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan  
Tel: +81-42-359-7888 Fax: +81-42-359-7442



ISO 14001 RION CO., LTD.  
ISO 9001 RION CO., LTD.



# Catalogue of Sound Calibrator

For microphone calibration **NC-74**

### How to use

Carefully insert the microphone all the way into the coupler of the NC-74. Then simply turn the power on to apply a constant sound pressure level to the diaphragm of the microphone.

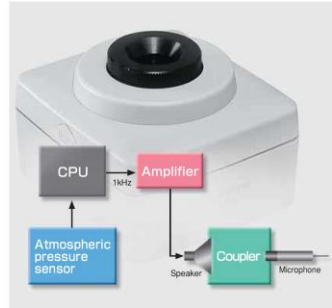


Usage example (NL series)

The performance of the NC-74 is suitable for calibration of high-precision sound level meters. The unit is compact, lightweight, and easy to use. Two IEC LR6 (size AA) alkaline batteries will power the unit for more than 30 hours of continuous use at room temperature.

### Atmospheric pressure compensation principle

The NC-74 incorporates a sensor that detects atmospheric pressure. Based on the information provided by the sensor, the CPU controls the signal amplitude. This allows the unit to always provide the correct output for achieving constant sound pressure level, regardless of fluctuations in atmospheric pressure.



### Using the 1/2-inch adapter

To allow calibration of sound level meter microphones with 1 inch diameter, the 1/2-inch microphone adapter can be removed. 1/2-inch microphones are calibrated with the adapter in place.



### Specifications

Applicable standards	IEC 60942:2003 Class 1 JIS C1615:2004 Class 1	
Suitable microphones	1-inch microphones	IEC 61094-1 Type LS1P UC-27 UC-25 UC-34
	1/2-inch microphones	IEC 61094-1 Type LS2aP UC-59 UC-57 UC-58A UC-56 UC-26 UC-30 UC-31 UC-33P
Nominal sound pressure level	94 dB	
Sound pressure level tolerance	±0.3 dB	
Nominal frequency	1 kHz	
Frequency tolerance	±1.0 % or less	
Power requirements	IEC LR6 (size AA) alkaline battery × 2	
Dimensions, mass	Approx. 49 (H) × 80 (W) × 74 (D) mm Approx. 200 g (including batteries)	
Supplied accessories	Class X 1	
	IEC LR6 (size AA) alkaline battery × 2 1/2-inch microphone adapter NC-74-002 × 1	

\* Specification subject to change without notice.

**RION CO., LTD.**  
3-20-41, Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan  
Tel: +81-42-359-7888 Fax: +81-42-359-7442  
<http://www.rion.co.jp/english/>

Distributed by:



ISO 14001 RION CO., LTD.  
ISO 9001 RION CO., LTD.

Printed in Japan 0510-1 0807.P.MP

# Calibration Certificate of Sound Calibrator



中国赛宝实验室计量检测中心  
(工业和信息化部电子第五研究所计量检测中心)  
CHINA CEPREI LABORATORY CALIBRATION & TESTING CENTRE

## 校准证书 CALIBRATION CERTIFICATE

证书编号: 2HB21001749-0002  
Certificate No.



委托单位: Castco Testing Centre Limited  
Client  
仪器名称: Sound Level Calibrator  
Description  
型号规格: NC-75  
Model/Type  
制造商: RION  
Manufacturer  
机身号: 34280310  
Serial No.  
管理号: AAST-SLC-07  
Asset No.  
接收日期: 2021-08-05  
Rec. Date  
校准日期: 2021-08-17  
Cal. Date  
签发日期: 2021-08-18  
App. Date  
建议校准周期: 12个月(12 months)  
Reference Cal. Period  
结论: 所校准项目合格(Passed at Calibration Items)  
Conclusion

校准: 赵文钰  
Calibrated by

核校: 张毅  
Inspected by

签发: 郑木方  
Approved by

印章: Stamp

赛宝计量检测中心  
广州总部地址: 广州市增城区朱村街朱村大道西78号  
客服电话: 020-87237633 传真: 020-87236189  
投诉电话: 020-87236896  
邮件: cal@ceprei.com  
网址: www.ceprei-cal.com

CEPREI Calibration and Testing Centre  
HQ Addr: No.78,Zhucun Avenue West,Zengcheng District,Guangzhou,China  
Service Tel: 020-87237633 Fax: 020-87236189  
Complaint Tel: 020-87236896  
Email: cal@ceprei.com  
Website: www.ceprei-cal.com

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# Calibration Certificate of Sound Calibrator

证书编号(Certificate No.): 2HB21001749-0002

## 说明 DIRECTIONS

1. 本机构质量管理体系符合ISO/IEC 17025:2017标准的要求, 获得中国合格评定国家认可委员会 (CNAS) 认可, 认可证书号为: CNAS L13344。  
This laboratory quality management system meets the ISO/IEC 17025:2017 and is accredited by the China National Accreditation Service for Conformity Assessment, No. CNAS L13344.
2. 本次校准的技术依据及CNAS认可范围(Reference documents and CNAS accredited scopes):
  - JJG 176-2005 声校准器检定规程: Sound Pressure Level: 94dB、104dB、114dB、124dB(63Hz~8kHz); 94dB、104dB、114dB(31.5Hz~16kHz); Frequency: 31.5Hz~16kHz; Harmonic Distortion: 0~10%。(20Hz~20kHz)。
  - 详细内容请查看CNAS网站中注册编号为L13344的证书附件, 超出范围的内容未被认可, 其结果结论所依据的合格评定活动不在认可范围内。(Please see the attachment of certificate No. L13344 at CNAS website for details, beyond which is not accredited, the conformity assessment activities on which the results/conclusions are based are outside the scope of accreditation.)
3. 本次校准所使用的主要测量标准(The main measurement standards used during the calibration):
 

名称 (Description)	证书号/有效期/溯源单位 (Certificate No./Due Date/Traceability to)	技术指标 (Specification)	测量范围 (Measuring Range)
标准传声器	LSs2021-13180/2022-04-24/中国计量院	$U=(0.05-0.20)$ dB ( $k=2$ )	10Hz~20kHz
PULSE分析系统	4GC21000026-0375/2022-01-21/赛宝(广州)	频率: $U_{cp}=0.001\%$ $k=2$ ;电压: $U_{cp}=0.04\%$ $k=2$	频率:0.001Hz~51.2kHz
前置放大器	LSs2021-13000/2022-04-19/中国计量院	$U=0.3$ dB ( $k=2$ )	(10~50000) Hz
4. 校准地点(The calibration place):  
广州市增城区朱村街朱村大道西78号9栋110室
5. 环境条件(Environmental conditions):  
温度(Temperature): 22.9°C 相对湿度(Relative Humidity): 59.5%
6. 本证书中给出的扩展不确定度依据JJF1059.1-2012《测量不确定度的评定与表示》评定, 由合成标准不确定度乘以包含概率约为95%时对应的包含因子 $k$ 得到。  
The extended uncertainty given in this certificate is evaluated according to JJF1059.1-2012 "Evaluation and Expression of Uncertainty in Measurement", and is calculated by multiplying the combined standard uncertainty by the coverage factor  $k$  which corresponding to the coverage probability about 95%.
7. 证书中"P"、"合格"代表"测量结果在允许范围内", "F"、"不合格"代表"测量结果不在允许范围内", "N/A"代表"不适用或技术指标暂时无法确认等"。本证书报告的结论仅供参考, 使用人员应结合实际测量的要求合理使用, 如考虑测量结果测量不确定度的影响等。  
"P" and "Pass" in this certificate stand for "Low Limit<the measured value <High Limit", "F" and "Fail" stand for "the measured value >Low Limit or the measured value >High Limit", "N/A" stands for "Not Applicable or The technical specification has not been confirmed etc".The conclusions of this certificate are for reference only. Users should use them reasonably according to the actual measurement requirements, such as considering the impact of measurement uncertainty, etc.
8. 建议校准周期是本实验室依据本证书报告的技术依据和仪器设备常规使用条件给出的建议, 供委托方参考。委托方可以根据实际使用情况自行决定样品的校准周期。  
The reference calibration period is based on the reference documents and normal operating conditions of the calibrated instrument. It is only for reference. The client may decide the calibration period of the instrument according to the actual use.

注: 1. 本证书未经本机构书面授权, 不得部分复制。(The certificate shall not be partly reproduced without written approval of the laboratory.)

2. 本次校准结果仅与被校物有关。(The results are only related to the items calibrated.)

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证书编号(Certificate No.): 2HB21001749-0002

### 1 外观与工作正常性检查 (Appearance and Function Check)

无影响证书中校准结果准确度的因素和缺陷。

There are no factor and defect that affect the calibration result accuracy of the certificate.

### 2 声压级 (Sound Pressure Level)

规定声压级 (Prescribed SPL)	测量声压级 (Measured SPL)	声压级差的绝对值 (Absolute value of SPL)	允许范围 (Limit)	结论 (Pass/Fail)	$U$ (dB)
94	94.12	0.12	$\leq 0.40$	P	0.10

### 3 频率 (Frequency)

规定频率 (Prescribed Fre.)	测量频率 (Measured Fre.)	频率误差的绝对值 (Absolute value of Fre.)	允许范围 (Limit)	结论 (Pass/Fail)	$U_{rel}$ (%)
1000	1000.0	0.00	$\leq 1.00$	P	0.10

### 4 总失真 (Distortion)

规定声压级 (Prescribed SPL)	规定频率 (Measured Fre.)	总失真 (Distortion)	允许范围 (Limit)	结论 (Pass/Fail)	$U_{rel}$ (%)
94	1000	0.15	$\leq 3.00$	P	5.0

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ID: 013393

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# Calibration Certificate of Sound Calibrator

AAST-SLC-05  
Cal Cert: 2021/07/19



**中国赛宝实验室计量检测中心**  
(工业和信息化部电子第五研究所计量检测中心)  
**CHINA CEPREI LABORATORY CALIBRATION & TESTING CENTRE**

## 校准证书 CALIBRATION CERTIFICATE

证书编号: 2HB21001370-0004  
Certificate No.



委托单位: Client	Castco Testing Centre Limited	
仪器名称: Description	Sound Level Calibrator	
型号规格: Model/Type	NC-74	
制造商: Manufacturer	RION	
机身号: Serial No.	34178129	
管理号: Asset No.	AAST-SLC-05	
接收日期: Rec. Date	2021-07-08	校准日期: Cal. Date
签发日期: App. Date	2021-07-19	建议校准周期: Reference Cal. Period
结论: Conclusion	所校准项目合格(Passed at Calibration Items)	

校准:  
Calibrated by

签发:  
Approved by

核验:  
Inspected by

印章:  
Stamp

赛宝计量检测中心  
广州总部地址: 广州市增城区朱村街朱村大道西78号  
客服电话: 020-87237633 传真: 020-87236189  
投诉电话: 020-87236896  
邮件: cal@ceprei.com  
网址: www.ceprei-cal.com

CEPREI Calibration and Testing Centre  
HQ Addr: No.78,Zhuicun Avenue West,Zengcheng District,Guangzhou,China  
Service Tel: 020-87237633 Fax: 020-87236189  
Complaint Tel: 020-87236896  
Email: cal@ceprei.com  
Website: www.ceprei-cal.com

证书编号(Certificate No.): 2HB21001370-0004

## 说明 DIRECTIONS

1. 本机构质量管理体系符合ISO/IEC 17025:2017标准的要求, 获得中国合格评定国家认可委员会(CNAS) 认可, 认可证书号为: CNAS L13344。  
This laboratory quality management system meets the ISO/IEC 17025:2017 and is accredited by the China National Accreditation Service for Conformity Assessment, No. CNAS L13344.

2. 本次校准的技术依据及CNAS认可范围(Reference documents and CNAS accredited scopes):  
 \* JJG 176-2005 声校准器检定规程: Sound Pressure Level: 94dB、104dB、114dB、124dB(63Hz~8kHz); 94dB、104dB、114dB(31.5Hz~16kHz); Frequency: 31.5Hz~16kHz; Harmonic Distortion: 0~10%, (20Hz~20kHz).  
 \* 详细内容请查看CNAS网站中注册编号为L13344的证书附件, 超出范围的内容未被认可, 其结果/结论所依据的合格评定活动不在认可范围内。(Please see the attachment of certificate No. L13344 at CNAS website for details, beyond which is not accredited, the conformity assessment activities on which the results/conclusions are based are outside the scope of accreditation.)

3. 本次校准所使用的主要测量标准(The main measurement standards used during the calibration):

名称 (Description)	证书号/有效期/溯源单位 (Certificate No./Due Date/Traceability to)	技术指标 (Specification)	测量范围 (Measuring Range)
PULSE分析系统	4GC21000026-0375/2023-01-21/赛宝(广州)	频率: $U_{10} = 0.001\%$ , $k=2$ ; 电压: $U_{10} = 0.04\%$ , $k=2$	频率: 0.001Hz~51.2kHz, 电压: $(1 \times 10^{-3} \sim 30)$ V
标准传声器	LSsx2021-13180/2022-04-24/中国计量院	$U = (0.05 \sim 0.20)$ dB ( $k=2$ )	20Hz~20kHz
前置放大器	LSsx2021-13000/2022-04-19/中国计量院	$U = 0.3$ dB ( $k=2$ )	(10~50000) Hz

4. 校准地点(The calibration place):  
广州市增城区朱村街朱村大道西78号9栋110室

5. 环境条件(Environmental conditions):  
温度(Temperature): 23.3°C 相对湿度(Relative Humidity): 59.6%

6. 本证书中给出的扩展不确定度依据JJF1059.1-2012《测量不确定度的评定与表示》评定, 由合成标准不确定度乘以包含概率约为95%时对应的包含因子 $k$ 得到。  
The extended uncertainty given in this certificate is evaluated according to JJF1059.1-2012 "Evaluation and Expression of Uncertainty in Measurement", and is calculated by multiplying the combined standard uncertainty by the coverage factor  $k$  which corresponding to the coverage probability about 95%.

7. 证书中"P"、"合格"代表"测量结果在允许范围内", "F"、"不合格"代表"测量结果不在允许范围内", "N/A"代表"不适用或技术指标暂时无法确认等"。本证书报告的结论仅供参考, 使用人员应结合实际测量的要求合理使用, 如考虑测量结果测量不确定度的影响等。  
"P" and "Pass" in this certificate stand for "Low Limit ≤ the measured value ≤ High Limit", "F" and "Fail" stand for "the measured value < Low Limit or the measured value > High Limit", "N/A" stands for "Not Applicable or the technical specification has not been confirmed etc". The conclusions of this certificate are for reference only. Users should use them reasonably according to the actual measurement requirements, such as considering the impact of measurement uncertainty, etc.

8. 建议校准周期是本实验室依据本证书报告的技术依据和仪器设备常规使用条件给出的建议, 供委托方参考。委托方可以根据实际使用情况自行决定样品的校准周期。  
The reference calibration period is based on the reference documents and normal operating conditions of the calibrated instrument. It is only for reference. The client may decide the calibration period of the instrument according to the actual use.

注: 1. 本证书未经本机构书面授权, 不得部分复制。(The certificate shall not be partly reproduced without written approval of the laboratory.)  
2. 本次校准结果仅与被校物有关。(The results are only related to the items calibrated.)



# Calibration Certificate of Sound Calibrator



证书编号(Certificate No.): 2HB21001370-0004

## 1 外观与工作正常性检查 (Appearance and Function Check)

无影响证书中校准结果准确度的因素和缺陷。

There are no factor and defect that affect the calibration result accuracy of the certificate.

## 2 声压级 (Sound Pressure Level)

规定声压级 (Prescribed SPL)	测量声压级 (Measured SPL)	声压级差的绝对值 (Absolute value of SPL)	允许范围 (Limit)	结论 (Pass/Fail)	$U$ (k=2)
(dB)	(dB)	(dB)	(dB)		(dB)
94	94.29	0.29	≤0.40	P	0.10

## 3 频率 (Frequency)

规定频率 (Prescribed Fre.)	测量频率 (Measured Fre.)	频率误差的绝对值 (Absolute value of Fre.)	允许范围 (Limit)	结论 (Pass/Fail)	$U_{rel}$ (k=2)
(Hz)	(Hz)	(%)	(%)		(%)
1000	1002.1	0.21	≤1.00	P	0.10

## 4 总失真 (Distortion)

规定声压级 (Prescribed SPL)	规定频率 (Measured Fre.)	总失真 (Distortion)	允许范围 (Limit)	结论 (Pass/Fail)	$U_{rel}$ (k=2)
(dB)	(Hz)	(%)	(%)		(%)
94	1000	1.34	≤3.00	P	5.0

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数据页(Data sheet) ID: 013393

第 5 页,共 5 页  
Page of

# Catalogue of Air Flow Meter (TSI TA440)

## SPECIFICATIONS

### THERMAL ANEMOMETERS MODELS TA410, TA430 AND TA440

#### Velocity

Range (TA410)	0 to 20 m/s (0 to 4,000 ft/min)
Range (TA430, TA440)	0 to 30 m/s (0 to 6,000 ft/min)
Accuracy (TA410) <sup>1a2</sup>	±5% of reading or ±0.025 m/s (±5 ft/min), whichever is greater
Accuracy (TA430, TA440) <sup>1a2</sup>	±3% of reading or ±0.015 m/s (±3 ft/min), whichever is greater
Resolution	0.01 m/s (1 ft/min)

#### Duct Size (TA430, TA440)

Dimensions	1 to 635 cm in increments of 0.1 cm (1 to 250 inches in increments of 0.1 in.)
------------	--

#### Volumetric Flow Rate (TA430, TA440)

Range	Actual range is a function of velocity, and duct size
-------	---

#### Temperature

Range (TA410, TA430)	-18 to 93°C (0 to 200°F)
Range (TA440)	-10 to 60°C (14 to 140°F)
Accuracy <sup>3</sup>	±0.3°C (±0.5°F)
Resolution	0.1°C (0.1°F)

#### Relative Humidity (TA440 only)

Range	5 to 95% RH
Accuracy <sup>4</sup>	±3% RH
Resolution	0.1% RH

#### Wet Bulb Temperature (TA440 only)

Range	5 to 60°C (40 to 140°F)
Resolution	0.1°C (0.1°F)

#### Dew Point (TA440 only)

Range	-15 to 49°C (5 to 120°F)
Resolution	0.1°C (0.1°F)

#### Instrument Temperature Range

Operating (Electronics)	5 to 45°C (40 to 113°F)
Model TA410, TA430 Operating (Probe)	-18 to 93°C (0 to 200°F)
Model TA440 Operating (Probe)	-10 to 60°C (14 to 140°F)
Storage	-20 to 60°C (-4 to 140°F)

#### Data Storage Capabilities (TA430, TA440)

Range	12,700+ samples and 100 test IDs
-------	----------------------------------

#### Logging Interval (TA430, TA440)

Range	1 second to 1 hour
-------	--------------------

Specifications subject to change without notice.

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Visit our website at [www.airflowinstruments.co.uk](http://www.airflowinstruments.co.uk) for more information.

UK Tel: +44 149 4 459200 Germany Tel: +49 241 523030  
France Tel: +33 491 11 87 64

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#### Time Constant (TA430, TA440)

User selectable

#### External Meter Dimensions

8.4 cm x 17.8 cm x 4.4 cm (3.3 in. x 7.0 in. x 1.8 in.)

#### Meter Weight with Batteries

0.27 kg (0.6 lbs.)

#### Meter Probe Dimensions

Probe Length	101.6 cm (40 in.)
Probe Diameter of Tip	7.0 mm (0.28 in.)
Probe Diameter of Base	13.0 mm (0.51 in.)

#### Articulating Probe Dimensions

Articulating Section Length	19.7 cm (7.8 in.)
Diameter of Articulating Knuckle	9.5 mm (0.38 in.)

#### Power Requirements

Four AA-size batteries or AC adapter

	TA410	TA430 TA430-A	TA440 TA440-A
Velocity range 0 to 20.00 m/s (0 to 4000 ft/min)	+		
Velocity range 0 to 30.00 m/s (0 to 6000 ft/min)		+	+
Temperature	+	+	+
Flow		+	+
Humidity, wet bulb, dew point			+
Probe	Straight	Straight or -A articulated	Straight or -A articulated
Variable time constant		+	+
Manual data logging		+	+
Auto save data logging		+	+
Statistics		+	+
Review data		+	+
LogDat2 downloading software		+	+
Free Certificate of Calibration	+	+	+

<sup>1</sup> Temperature compensated over an air temperature range of 5 to 65°C (40 to 150°F).

<sup>2</sup> The accuracy statement begins at 30 ft/min through 4000 ft/min (0.15 m/s through 20 m/s) for the Model TA410, and 30 ft/min through 6000 ft/min (0.15 m/s through 30 m/s) for Models TA430 and TA440.

<sup>3</sup> Accuracy with instrument case at 25°C (77°F), add uncertainty of 0.03°C (0.05°F) for change in instrument temperature.

<sup>4</sup> Accuracy with probe at 25°C (77°F). Add uncertainty of 0.2% RH/°C (0.1% RH/°F) for change in probe temperature. Includes 1% hysteresis.

## Calibration Certificate of Air Flow Meter



**Cal Lab Limited 校正實驗室有限公司**

Room 2103, Technology Plaza, 29-35 Sha Tsui Road,  
Tsuen Wan, NT, Hong Kong  
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Fax: +852 30116194 Website: www.callab.com.hk



**Calibration Certificate No.: CC0322201**

**Customer Information**

Customer: Castco Testing Centre Limited  
Address: 33 On Kui Street, Fanling, N.T., Hong Kong

**Equipment Identification**

Equipment Description	Manufacturer	Model No.	Serial No.	Assigned equipment No.:
Air Velocity Meter	TSI	TA440	TA4401232005	AAST-FLOW-02

**Certificate Information**

Date of Receipt:	21 January 2022	Calibration Condition:	24.3°C, 53%RH, 1008hPa
Date of Calibration:	25 January 2022	Adjustment:	N/A
Due Date of Calibration:	N/A	Appearance:	Good
Calibration Procedure:	SOP-116	Remark:	N/A

**Reference Equipment Identification**

Equipment Description	Model	Serial No.	Expiration Date
Hot Wire Anemometer	9535	T95351316004	11 July 2022

**Result of Calibration**

Air Flow Rate					
Reference Reading (m/s)	Measured Reading (m/s)	Error (%)	Uncertainty (%FS)	Technical Requirement	Technical Reference Doc.
0.00	0.00	N/A	3.6	± 3%	Mfr's Spec.
0.51	0.50	-2.0	3.6	± 3%	Mfr's Spec.
5.02	4.89	-2.6	3.6	± 3%	Mfr's Spec.
10.03	9.74	-2.9	3.6	± 3%	Mfr's Spec.

CT-AFR-01

- Note1: The estimated expanded uncertainties have been calculated in "Evaluation and expression of uncertainty in measurement" and give an internal estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.  
 Note2: The standard (s) and instrument used in the calibration are traceable to national or international recognized standard and are calibrated on a schedule to maintain the accuracy and good condition.  
 Note3: The result 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.  
 Note4: The result shows in this calibration certificate relate only to the item calibrated, and the result only applies to the calibration item as received.

Calibrated By:

*Rex Tse*  
Rex Tse

Checked and Approved By:

*Warren Yeung*  
Warren Yeung

Company Chop:



Certificate Issue Date: 25 January 2022

CT-BEG-03

\*\*\* End of Certificate \*\*\*

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 2. The certificate is issued subject to the latest Terms and Conditions, available at our web site

CC0322201  
Page 1 of 1



**Cal Lab Limited 校正實驗室有限公司**

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Tsuen Wan, NT, Hong Kong  
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Fax: +852 30116194 Website: www.callab.com.hk



**Calibration Certificate No.: CC0322201**

**Customer Information**

Customer: Castco Testing Centre Limited  
Address: 33 On Kui Street, Fanling, N.T., Hong Kong

**Equipment Identification**

Equipment Description	Manufacturer	Model No.	Serial No.	Assigned equipment No.:
Air Velocity Meter	TSI	TA440	TA4401706003	AAST-FLOW-03

**Certificate Information**

Date of Receipt:	21 January 2022	Calibration Condition:	24.3°C, 53%RH, 1008hPa
Date of Calibration:	25 January 2022	Adjustment:	N/A
Due Date of Calibration:	N/A	Appearance:	Good
Calibration Procedure:	SOP-116	Remark:	N/A

**Reference Equipment Identification**

Equipment Description	Model	Serial No.	Expiration Date
Hot Wire Anemometer	9535	T95351316004	11 July 2022

**Result of Calibration**

Air Flow Rate					
Reference Reading (m/s)	Measured Reading (m/s)	Error (%)	Uncertainty (%FS)	Technical Requirement	Technical Reference Doc.
0.00	0.00	N/A	3.6	± 3%	Mfr's Spec.
0.51	0.50	-2.0	3.6	± 3%	Mfr's Spec.
5.02	4.89	-2.6	3.6	± 3%	Mfr's Spec.
10.03	10.05	2.0	3.6	± 3%	Mfr's Spec.

CT-AFR-01

- Note1: The estimated expanded uncertainties have been calculated in "Evaluation and expression of uncertainty in measurement" and give an internal estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.  
 Note2: The standard (s) and instrument used in the calibration are traceable to national or international recognized standard and are calibrated on a schedule to maintain the accuracy and good condition.  
 Note3: The result 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.  
 Note4: The result shows in this calibration certificate relate only to the item calibrated, and the result only applies to the calibration item as received.

Calibrated By:

*Rex Tse*  
Rex Tse

Checked and Approved By:

*Warren Yeung*  
Warren Yeung

Company Chop:



Certificate Issue Date: 25 January 2022

CT-BEG-03

\*\*\* End of Certificate \*\*\*

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 2. The certificate is issued subject to the latest Terms and Conditions, available at our web site

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**Appendix K – Noise monitoring results and graphical presentation**

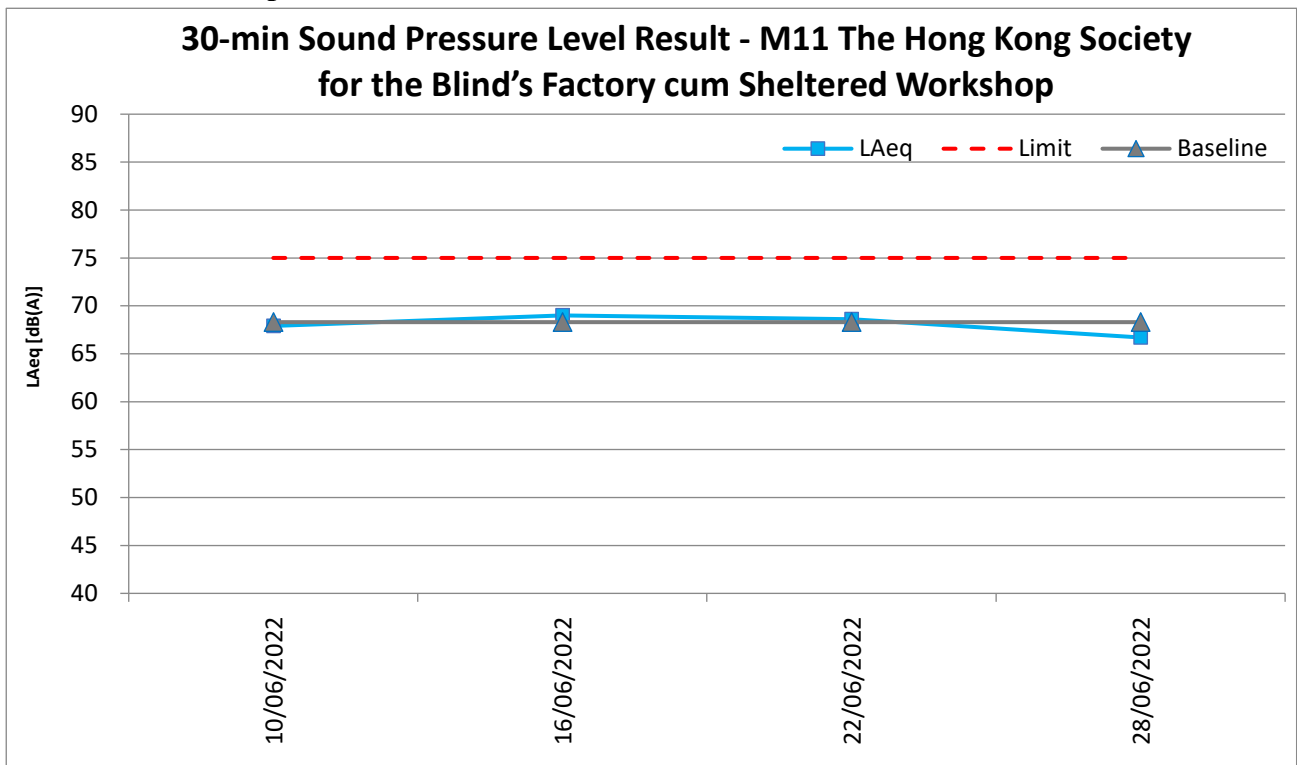
**M11 - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop**

Date	Temp (°C)	Weather	Measured Noise Level at M11, dB(A)							Limit
			Time		Baseline	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>		
10/06/2022	27.3	Cloudy	10:55	-	11:25	68.3	67.9	70.6	62.2	75
16/06/2022	30.9	Cloudy	13:43	-	14:13	68.3	69.0	73.1	60.3	75
22/06/2022	30.5	Sunny	14:23	-	14:53	68.3	68.6	70.9	62.2	75
28/06/2022	32.9	Sunny	11:10	-	11:40	68.3	66.7	69.7	59.7	75
							Maximum	69.0		
							Minimum	66.7		
							Average	68.1		

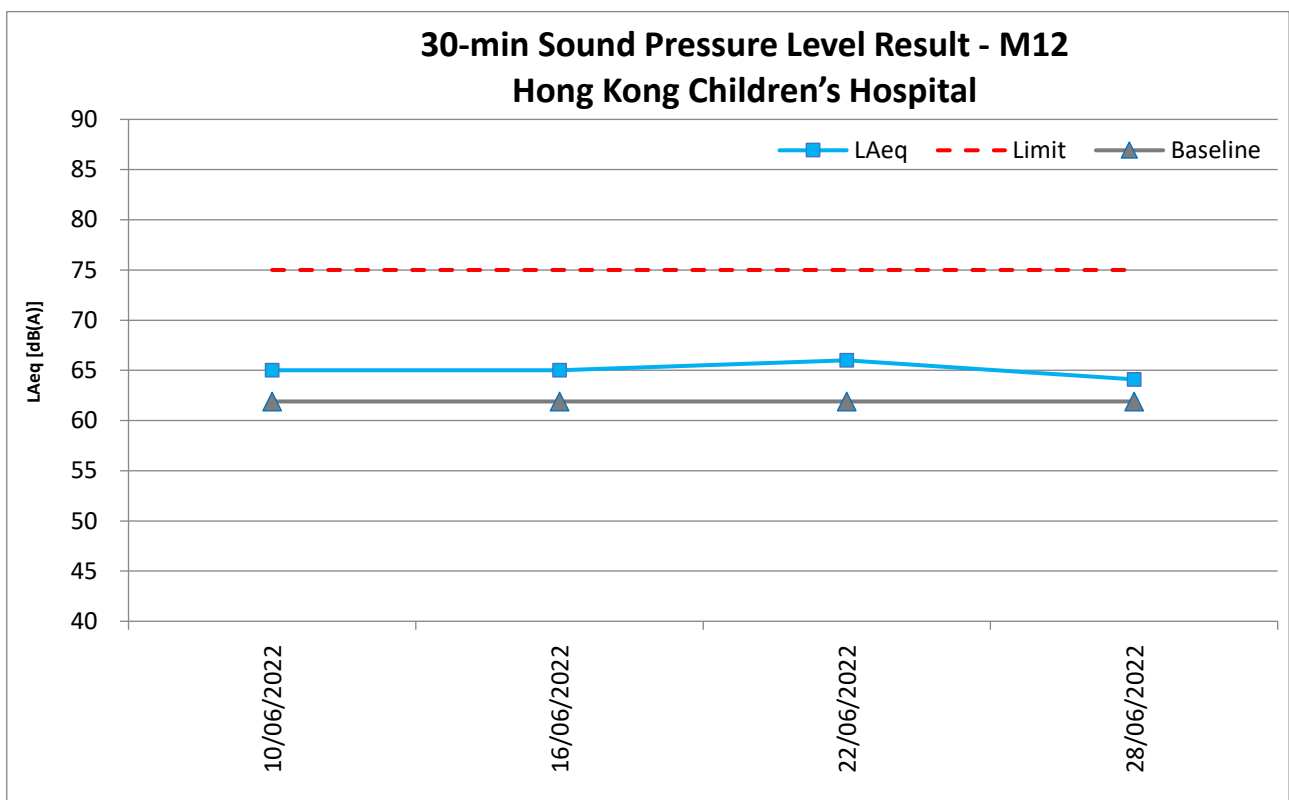
**M12 - Hong Kong Children's Hospital**

Date	Temp (°C)	Weather	Measured Noise Level at M12, dB(A)							Limit
			Time		Baseline	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>		
10/06/2022	27.3	Cloudy	14:56	-	15:26	61.9	65.0	66.8	63.0	75
16/06/2022	30.9	Cloudy	9:26	-	9:56	61.9	65.0	66.5	63.1	75
22/06/2022	30.5	Sunny	9:51	-	10:21	61.9	66.0	67.6	64.1	75
28/06/2022	32.9	Sunny	15:02	-	15:32	61.9	64.1	66.9	61.2	75
							Maximum	66.0		
							Minimum	64.1		
							Average	65.1		

**L<sub>Aeq</sub>, 30-min graphical results of M11 - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop**



**L<sub>Aeq</sub>, 30-min graphical results of M12 - Hong Kong Children's Hospital**



**Appendix L – Event and Action Plan for noise**



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

Event	Action			
	ET	IEC	Supervisor / ER	Contractor
	<p>Contractor's remedial actions and keep IEC, EPD, and Supervisor /ER informed of the results;</p> <p>8. If exceedance stops, cease additional monitoring. (The above actions should be taken within 2 working days after the exceedance is identified.)</p>		<p>exceedance until the exceedance is abated. (The above actions should be taken within 2 working days after the exceedance is identified.)</p>	<p>taken within 2 working days after the exceedance is identified.)</p>

**Appendix M – Event and Action Plan for Landscape and Visual Impact**

Event	Action			
	ET	IEC	Supervisor / ER	Contractor
Design Check	<ol style="list-style-type: none"> <li>1. Check final design conforms to the requirements of EP and prepare report.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check report.</li> <li>2. Recommend remedial design if necessary.</li> </ol>	<ol style="list-style-type: none"> <li>1. Undertake remedial design if necessary.</li> </ol>	
Non-conformity on one occasion	<ol style="list-style-type: none"> <li>1. Identify Source.</li> <li>2. Inform IEC and Supervisor /ER.</li> <li>3. Discuss remedial actions with IEC, Supervisor /ER and Contractor.</li> <li>4. Monitor remedial actions until rectification has been completed.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check report.</li> <li>2. Check Contractor's working method.</li> <li>3. Discuss with ET and Contractor on possible remedial measures.</li> <li>4. Advise Supervisor /ER on effectiveness of proposed remedial measures.</li> <li>5. Check implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify Contractor.</li> <li>2. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Amend working methods.</li> <li>2. Rectify damage and undertake any necessary replacement.</li> </ol>
Repeated Non-conformity	<ol style="list-style-type: none"> <li>1. Identify Source.</li> <li>2. Inform IEC and Supervisor /ER.</li> <li>3. Increase monitoring frequency.</li> <li>4. Discuss remedial actions with IEC, Supervisor /ER and Contractor.</li> <li>5. Monitor remedial actions until rectification has been completed.</li> <li>6. If non-conformity stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring report.</li> <li>2. Check Contractor's working method.</li> <li>3. Discuss with ET and Contractor on possible remedial measures.</li> <li>4. Advise Supervisor /ER on effectiveness of proposed remedial measures.</li> <li>5. Supervise implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify Contractor.</li> <li>2. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Amend working methods.</li> <li>2. Rectify damage and undertake any necessary replacement.</li> </ol>

**Appendix N – Waste Flow Table**

## Appendix F - Monthly Summary Waste Flow Table

Name of Department: CEDD

Contract No.: ED/2018/01

**Monthly Summary Waste Flow Table for June 2022**

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
Jan	0.832	--	--	--	0.832	--	--	0.100	--	--	0.144
Feb	0.749	--	0.450	--	0.299	--	--	--	--	--	0.124
Mar	0.768	--	--	--	0.768	--	--	--	--	--	0.154
Apr	0.488	--	--	--	0.488	--	--	--	--	--	0.167
May	2.374	--	--	--	2.374	--	--	--	--	--	0.190
Jun	4.154	--	0.442	--	2.212	1.500	--	--	--	--	0.184
<b>Sub-total</b>	<b>9.365</b>	<b>--</b>	<b>0.892</b>	<b>--</b>	<b>6.973</b>	<b>1.500</b>	<b>--</b>	<b>0.100</b>	<b>--</b>	<b>--</b>	<b>0.963</b>
July											
Aug											
Sep											
Oct											
Nov											
Dec											
<b>Total</b>	<b>9.365</b>	<b>--</b>	<b>0.892</b>	<b>--</b>	<b>6.973</b>	<b>1.500</b>	<b>--</b>	<b>0.100</b>	<b>--</b>	<b>--</b>	<b>0.963</b>
Forecast of Total Quantities of C&D Materials to be Generated from the Contract*											
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse	
(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )	
<b>195.01</b>	<b>2.103</b>	<b>10.2</b>	<b>140</b>	<b>19.81</b>	<b>25</b>	<b>200</b>	<b>0.8</b>	<b>0.1</b>	<b>--</b>	<b>3.4</b>	

- Notes: (1) The performance targets are given in **ER Appendix 8I Clause 14** and the EM&A Manual  
 (2) The waste flow table shall also include C&D materials to be imported for use at the Site  
 (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material and water barrier  
 (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000m<sup>3</sup> (**ER Part 8 Clause 8.7.5(d)**(ii) refers)  
 (5) Assume inert C&D materials density and non-inert C&D materials are 1.9 m<sup>3</sup>/ton and 1.5 m<sup>3</sup>/ton



**Appendix O – Environmental Mitigation Implementation Schedule  
(EMIS)**

<b>Implementation Schedule for Air Quality Measures</b>			
<b>EIA for KTD Development Ref.</b>	<b>EIA for KTD – Roads D3A &amp; D4A Ref.</b>	<b>Environmental Protection Measures / Mitigation Measures</b>	<b>Status</b>
S3.2		8 times daily watering of the work site with active dust emitting activities.	^
S3.2	S4.8	Implementation of dust suppression measures stipulated in Air Pollution Control (Construction Dust) Regulation. The following mitigation measures, good site practices and a comprehensive dust monitoring and audit programme are recommended to minimize cumulative dust impacts.	^
		- Stockpiling site(s) should be lined with impermeable sheeting and bunded. Stockpiles should be fully covered by impermeable sheeting to reduce dust emission.	^
		- Misting for the dusty material should be carried out before being loaded into the vehicle.	^
		- Any vehicle with an open load carrying area should have properly fitted side and tail boards.	^
		- Material having the potential to create dust should not be loaded from a level higher than the side and tail boards and should be dampened and covered by a clean tarpaulin.	^
		- The tarpaulin should be properly secured and should extent at least 300 mm over the edges of the sides and tailboards. The material should also be dampened if necessary, before transportation.	^
		- The vehicles should be restricted to maximum speed of 10 km per hour and confined haulage and delivery vehicle to designated roadways insider the site. On- site unpaved roads should be compacted and kept free of lose materials.	^
		- Vehicle washing facilities should be provided at every vehicle exit point.	^
		- The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores.	^
		- Every main haul road should be scaled with concrete and kept clear of dusty materials or sprayed with water so as to maintain the entire road surface wet.	^
		- Every stock of more than 20 bags of cement should be covered entirely by impervious sheeting placed in an area sheltered on the top and the three sides.	^
		- Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites.	^

<b>Implementation Schedule for Noise Measures</b>			
<b>EIA for KTD Development Ref.</b>	<b>EIA for KTD – Roads D3A &amp; D4A Ref.</b>	<b>Environmental Protection Measures / Mitigation Measures</b>	<b>Status</b>
S3.3		Use of quiet PME, movable barriers for Asphalt Paver, Breaker, Excavator and Hand-held breaker and full enclosure for Air Compressor, Bar Bender, Concrete Pump, Generator and Water Pump.	^
S3.3		Good Site Practice:	
S3.3		- Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.	^
		- Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program.	^
		- Mobile plant, if any, should be sited as far away from NSRs as possible.	^
		- Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum.	^
		- Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.	^
		- Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	^
		- Scheduling of Construction Works during School Examination Period	N/A

<b>Implementation Schedule for Water Quality Measures</b>			
<b>EIA for KTD Development Ref.</b>	<b>EIA for KTD – Roads D3A &amp; D4A Ref.</b>	<b>Environmental Protection Measures / Mitigation Measures</b>	<b>Status</b>
S3.4		<u>Construction Runoff</u> Exposed soil areas should be minimised to reduce the potential for increased siltation, contamination of runoff, and erosion. Construction runoff related impacts associated with the above ground construction activities can be readily controlled through the use of appropriate mitigation measures which include:	^
S3.4		- use of sediment traps.	^
S3.4		- adequate maintenance of drainage systems to prevent flooding and overflow.	^

<b>Implementation Schedule for Water Quality Measures</b>			
<b>EIA for KTD Development Ref.</b>	<b>EIA for KTD – Roads D3A &amp; D4A Ref.</b>	<b>Environmental Protection Measures / Mitigation Measures</b>	<b>Status</b>
	S5.8	- Surface run-off from construction sites should be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sedimentation basins.	^
	S5.8	- Channels or earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels should be provided on site boundaries where necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks.	^
	S5.8	- Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to prevent local flooding. Any practical options for the diversion and re-alignment of drainage should comply with both engineering and environmental requirements in order to provide adequate hydraulic capacity of all drains. Minimum distance of 100 m should be maintained between the discharge points of construction site run-off and the existing saltwater intakes.	^
	S5.8	- Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary.	^
	S5.8	- Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	^
	S5.8	- Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric during rainstorms.	^
	S5.8	- Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul	^

<b>Implementation Schedule for Water Quality Measures</b>			
<b>EIA for KTD Development Ref.</b>	<b>EIA for KTD – Roads D3A &amp; D4A Ref.</b>	<b>Environmental Protection Measures / Mitigation Measures</b>	<b>Status</b>
		sewerage system.	
	S5.8	- Good site practices should be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis.	^
S3.4		Construction site should be provided with adequately designed perimeter channel and pre-treatment facilities and proper maintenance. The boundaries of critical areas of earthworks should be marked and surrounded by dykes or embankments for flood protection. Temporary ditches should be provided to facilitate runoff discharge into the appropriate watercourses, via a silt retention pond. Permanent drainage channels should incorporate sediment basins or traps and baffles to enhance deposition rates. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94.	^
S3.4	S5.8	Ideally, construction works should be programmed to minimise surface excavation works during the rainy season (April to September). All exposed earth areas should be completed as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks where practicable.  If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means.  If excavation in soil cannot be avoided in these months or at any time of year when rainstorms are likely, for the purpose of preventing soil erosion, temporary exposed slope surfaces should be covered e.g. by tarpaulin, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels should be provided (e.g. along the crest / edge of excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements should always be in place in such a way that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm.	^
S3.4		Sediment tanks of sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m <sup>3</sup> capacity, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity is flexible and able to handle multiple inputs from a variety of sources	^

<b>Implementation Schedule for Water Quality Measures</b>			
<b>EIA for KTD Development Ref.</b>	<b>EIA for KTD – Roads D3A &amp; D4A Ref.</b>	<b>Environmental Protection Measures / Mitigation Measures</b>	<b>Status</b>
		and particularly suited to applications where the influent is pumped.	
S3.4		Open stockpiles of construction materials (for examples, aggregates, sand and fill material) of more than 50 m <sup>3</sup> 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.	^
S3.4		Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers.	^
S3.4		Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events.	^
S3.4		Oil interceptors should be provided in the drainage system and regularly cleaned to prevent the release of oils and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain.	NA
S3.4	S5.8	<u>Wheel Washing Water</u> 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 located wheel washing bay should be provided at every site exit, and wash-water should have sand and silt settled out and removed at least on a weekly basis 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.	^
S3.4		<u>Drainage</u> It is recommended that on-site drainage system should be installed prior to the commencement of other construction activities. Sediment traps should be installed in order to minimise the sediment loading of the effluent prior to discharge into foul sewers. There should be no direct discharge of effluent from the site into the sea.	^
S3.4		All temporary and permanent drainage pipes and culverts provided	^



<b>Implementation Schedule for Water Quality Measures</b>			
<b>EIA for KTD Development Ref.</b>	<b>EIA for KTD – Roads D3A &amp; D4A Ref.</b>	<b>Environmental Protection Measures / Mitigation Measures</b>	<b>Status</b>
		to facilitate runoff discharge should be adequately designed for the controlled release of storm flows. All sediment control measures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rain storms. The temporarily diverted drainage should be reinstated to its original condition when the construction work has finished or the temporary diversion is no longer required.	
S3.4		All fuel tanks and storage areas should be provided with locks and be located on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank, to prevent spilled fuel oils from reaching the coastal waters of the Victoria Harbour WCZ.	^
S3.4	S5.8	<p><u>Sewage Effluent</u></p> <p>Construction work force sewage discharges on site are expected to be connected to the existing trunk sewer or sewage treatment facilities. The construction sewage may need to be handled by portable chemical toilets prior to the commission of the on-site sewer system. Appropriate numbers of portable toilets should be provided by a licensed contractor to serve the large number of construction workers over the construction site. The Contractor should also be responsible for waste disposal and maintenance practices.</p> <p>Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the surrounding environment. Regular environmental audit of the construction site will provide an effective control of any malpractices and can encourage continual improvement of environmental performance on site. It is anticipated that sewage generation during the construction phase of the project would not cause water pollution problem after undertaking all required measures.</p>	^
S3.4		<p><u>Stormwater Discharges</u></p> <p>Minimum distances of 100 m should be maintained between the existing or planned stormwater discharges and the existing or planned seawater intakes</p>	^
S3.4		<p><u>Debris and Litter</u></p> <p>In order to maintain water quality in acceptable conditions with regard to aesthetic quality, contractors should be required, under conditions of contract, to ensure that site management is optimised</p>	^

<b>Implementation Schedule for Water Quality Measures</b>			
<b>EIA for KTD Development Ref.</b>	<b>EIA for KTD – Roads D3A &amp; D4A Ref.</b>	<b>Environmental Protection Measures / Mitigation Measures</b>	<b>Status</b>
		and that disposal of any solid materials, litter or wastes to marine waters does not occur.	
	S5.8	<u>Boring and Drilling Water</u> Water used in ground boring and drilling for site investigation or rock / soil anchoring should as far as practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater should be discharged into storm drains via silt removal facilities.	^
	S5.8	<u>Acid Cleaning, Etching and Pickling Wastewater</u> Acidic wastewater generated from acid cleaning, etching, pickling and similar activities should be neutralized to within the pH range of 6 to 10 before discharging into foul sewers.	NA
	S5.8	<u>Effluent Discharge</u> There is a need to apply to EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas should be treated so that it satisfies all the standards listed in the TM-DSS. Minimum distance of 100 m should be maintained between the discharge points of construction site effluent and the existing seawater intakes and the planned WSR mentioned in S5.3.1 as appropriate. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the relevant WPCO licence which is under the ambit of regional office (RO) of EPD.	^
	S5.8	<u>Accidental Spillage</u> Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation, should be observed and complied with for control of chemical wastes. Any service shop and maintenance facilities should be located on	^

<b>Implementation Schedule for Water Quality Measures</b>			
<b>EIA for KTD Development Ref.</b>	<b>EIA for KTD – Roads D3A &amp; D4A Ref.</b>	<b>Environmental Protection Measures / Mitigation Measures</b>	<b>Status</b>
		hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.	
	S5.8	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: - Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.	^
	S5.8	- Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents.	^
	S5.8	- Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.	^

<b>Implementation Schedule for Waste Management Measures</b>			
<b>EIA for KTD Development Ref.</b>	<b>EIA for KTD – Roads D3A &amp; D4A Ref.</b>	<b>Environmental Protection Measures / Mitigation Measures</b>	<b>Status</b>
S3.5		<u>Good Site Practices</u> It is not anticipated that adverse waste management related impacts would arise, provided that good site practices are adhered to. Recommendations for good site practices during construction activities include:	
S3.5		- 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.	^
	S6.7	- Prepare a Waste Management Plan, which becomes a part of the Environmental Management Plan, in accordance with the requirements stipulated in ETWB TC(W) No. 19/2005, approved by the Engineer/Supervising Officer of the Project based on current practices on construction sites.	^
S3.5	S6.7	- Training of site personnel in proper waste management and chemical waste handling procedures.	^

<b>Implementation Schedule for Waste Management Measures</b>			
<b>EIA for KTD Development Ref.</b>	<b>EIA for KTD – Roads D3A &amp; D4A Ref.</b>	<b>Environmental Protection Measures / Mitigation Measures</b>	<b>Status</b>
S3.5	S6.7	- Provision of sufficient waste disposal points and regular collection for disposal.	^*
S3.5	S6.7	- Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.	^
S3.5		- A recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites).	^
	S6.7	- Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.	^
	S6.7	- Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.	^
S3.5		<u>Waste Reduction Measures</u> Good management and control can prevent the generation of a significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:	^
S3.5	S6.7	- Sort C&D waste from demolition of the remaining structures to recover recyclable portions such as metals.	NA
S3.5	S6.7	- Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.	^
S3.5	S6.7	- Encourage collection of aluminium cans, PET bottles and paper by providing separate labelled bins to enable these wastes to be segregated from other general refuse generated by the work force.	^
S3.5		- Any unused chemicals or those with remaining functional capacity should be recycled.	^
S3.5	S6.7	- Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	^
S3.5		<u>Construction and Demolition Materials</u> Mitigation measures and good site practices should be incorporated in the contract document to control potential environmental impact from handling and transportation of C&D material. The mitigation measures include:	
S3.5		- Where it is unavoidable to have transient stockpiles of C&D material within the Project work site pending collection for	^

<b>Implementation Schedule for Waste Management Measures</b>			
<b>EIA for KTD Development Ref.</b>	<b>EIA for KTD – Roads D3A &amp; D4A Ref.</b>	<b>Environmental Protection Measures / Mitigation Measures</b>	<b>Status</b>
		disposal, the transient stockpiles shall be located away from waterfront or storm drains as far as possible.	
S3.5		- Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric.	^
S3.5		- Skip hoist for material transport should be totally enclosed by impervious sheeting.	^
S3.5		- Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site.	^
S3.5		- The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores.	^
S3.5		- The load of dusty materials carried by vehicle leaving a construction site should be covered entirely by clean impervious sheeting to ensure dust materials do not leak from the vehicle.	^
S3.5		- All dusty materials should be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet.	^
S3.5		- The height from which excavated materials are dropped should be controlled to a minimum practical height to limit fugitive dust generation from unloading.	^
S3.5		- When delivering inert C&D material to public fill reception facilities, the material should consist entirely of inert construction waste and of size less than 250mm or other sizes as agreed with the Secretary of the Public Fill Committee. In order to monitor the disposal of the surplus C&D material at the designed public fill reception facility and to control fly tipping, a trip-ticket system as stipulated in the ETWB TCW No. 31/2004 “Trip Ticket System for Disposal of Construction and Demolition Materials” should be included as one of the contractual requirements and implemented by an Environmental Team undertaking the Environmental Monitoring and Audit work. An Independent Environmental Checker should be responsible for auditing the results of the system.	^
	S6.7	- Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation	^

<b>Implementation Schedule for Waste Management Measures</b>			
<b>EIA for KTD Development Ref.</b>	<b>EIA for KTD – Roads D3A &amp; D4A Ref.</b>	<b>Environmental Protection Measures / Mitigation Measures</b>	<b>Status</b>
		of waste.	
S3.5		<u>Chemical Waste</u> After use, chemical wastes (for example, cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Spent chemicals should be collected by a licensed collector for disposal at the CWTF or other licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	^
	S6.7	Separation of chemical wastes for special handling and appropriate treatment.	^
S3.5		<u>General Refuse</u> General refuse should be stored in enclosed bins or compaction units separate from C&D material. A licensed waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Effective collection and storage methods (including enclosed and covered area) of site wastes would be required to prevent waste materials from being blown around by wind, wastewater discharge by flushing or leaching into the marine environment, or creating odour nuisance or pest and vermin problem.	^





<b>Implementation Schedule for Landscape and Visual Measures</b>			
<b>EIA for KTD Development Ref.</b>	<b>EIA for KTD – Roads D3A &amp; D4A Ref.</b>	<b>Environmental Protection Measures / Mitigation Measures</b>	<b>Status</b>
S3.8.12		All existing trees should be carefully protected during construction.	^
S3.8.12		Trees unavoidably affected by the works should be transplanted where practical. Detailed transplanting proposal will be submitted to relevant government departments for approval in accordance with ETWBC 2/2004 and 3/2006. Final locations of transplanted trees should be agreed prior to commencement of the work.	NA
S3.8.12		Control of night-time lighting.	^
S3.8.12		Erection of decorative screen hoarding.	^
	S7.9	<u>Construction Site Control</u> - CM1 - Minimized construction area and contractor's temporary works areas.	^
		- CM2- Control of night-time lighting and glare by hooding all lights.	^
		- CM3 - Erection of decorative mesh screens or construction	^



Implementation Schedule for Landscape and Visual Measures			
EIA for KTD Development Ref.	EIA for KTD – Roads D3A & D4A Ref.	Environmental Protection Measures / Mitigation Measures	Status
		hoardings around works areas in visually unobtrusive colours.	
		- CM4 - Reduction of construction period to practical minimum.	^
		- CM5 - Limitation of / Ensuring no run-off into surrounding landscape and adjacent seawater areas.	^
		- CM6 - Temporary or advance landscape should be provided along the temporary access roads to the Cruise Terminal until such time as road D3 is open.	NA

Remarks:			
^	Compliance of mitigation measure.	X	Non-compliance of mitigation measure.
N/A	Not Applicable at this stage.	●	Non-compliance but rectified by the contractor.
N/A (1)	Not observed.		
*	Recommendation was made during site audit but improved/rectified by the contractor.	#	Recommendation was made during audit and to be improved/ rectified by the contractor.

**Mitigation Measures undertaken by the Contractor for site inspections**

			
Date:	02 June 2022	Date:	23 May 2022
Mitigation Measures:	The vehicles are restricted to maximum speed of 10 km per hour inside the site.	Mitigation Measures:	The open stockpiles of construction materials on sites were covered.
			
Date:	23 June 2022	Date:	30 June 2022
Mitigation Measures:	All vehicles have been cleaned before leaving at vehicle every exit point.	Mitigation Measures:	Equipment with QPME label was used.

**Appendix P – Summaries of Environmental Complaint, Warning,  
Summon and Notification of Successful Prosecution**

**Reporting Month: June 2022**

<b>Contract No.</b>	<b>Record of Complaint (Yes/No)</b>	<b>Record of Warning (Yes/No)</b>	<b>Notification of Summons and Successful Prosecutions (Yes/No)</b>
ED/2018/01	No	No	No

**Cumulative Statistics on Complaints, Notification of Summons and Successful Prosecutions upto reporting month**

<b>Contract No.</b>	<b>Record of Complaint</b>	<b>Record of Warning</b>	<b>Notification of Summons and Successful Prosecutions</b>
ED/2018/01	3	0	0

Complaint Log for ED/2018/01				
Complaint Ref. No.	Date of Complaint	Description of Complaint	Investigation / Recommendations / Actions	Close-Out Date / Status
C0001	A dust complaint was referred from the Contractor on 21 October 2020 regarding a public complaint via 1823 hotline (Case no. 3-6518939602) on 20 October 2020.	<ol style="list-style-type: none"> <li>1. The water spraying system was not operated in proper time.</li> <li>2. Stockpile was not covered properly.</li> <li>3. Haul road was not wetted.</li> <li>4. Materials transported on trucks were not provided with mechanical covers.</li> </ol>	<p><u>Investigation</u></p> <ol style="list-style-type: none"> <li>1. Based on the information provided by the Contractor on 22 October 2020, the water sprinklers system was sprayed every 15 minutes with 70 seconds interval automatically. For the area that water sprinklers system was not covered, manual water spraying was provided. Dump trucks were covered with mechanical cover after loading the materials. The stockpile area was covered by the tarpaulin during night time.</li> <li>2. Based on the monitoring results on 16 October 2020, the 1-hour and 24-hour TSP results were below the Action Levels and Limit Levels.</li> <li>3. Regular site inspection was conducted by ET on 22 October 2020, no adverse observation against the dust impact was recorded.</li> </ol> <p><u>Recommendations</u></p> <p>To minimize the impact for air quality, mitigation measures should be enhanced specially in dry seasons are recommended:</p> <ol style="list-style-type: none"> <li>1. Increase the frequency and duration for automatic water spraying system.</li> <li>2. Main haul road and the area that water sprinklers system was not covered in the construction site should be wetted by water trucks or manually in regular basis.</li> <li>3. Ensure stockpiling sites should be lined with impermeable sheeting and bunded. Stockpiles should be fully covered by impermeable sheeting at all time except during working process.</li> </ol> <p><u>Action taken</u></p>	<ul style="list-style-type: none"> <li>- Closed-out on 5 Nov 2020</li> <li>- No further complaint was received.</li> </ul>

Complaint Log for ED/2018/01				
Complaint Ref. No.	Date of Complaint	Description of Complaint	Investigation / Recommendations / Actions	Close-Out Date / Status
			As per the Contractor, the water sprinkler are now adjusted to start at 8:00am and end at 6:00pm for Monday to Saturday while from 8:00am to 5:00pm on Sunday. Water spraying are set with 5-minute time interval with duration 30-60 seconds.	
C0002	A dust complaint was referred from the Contractor on 8 September 2021 through E-Mail regarding a complaint received by EPD (EPD ref.: K19/RE/00021205-21) on 7 September 2021.	Complaint of dust problem at the pavement of Muk Tai Street near Sports Park.	<p><u>Investigation</u></p> <p>As per contractor, part of the complaint area was within the site boundary of the project.</p> <ul style="list-style-type: none"> <li>- Manual water spraying was provided.</li> <li>- The exposed surface and stockpile areas were covered by the impermeable tarpaulin sheet.</li> </ul> <p><u>Recommendations</u></p> <p>There was no direct evidence showing that the dust nuisance was caused by the contractor at the complaint area, however the contractor is recommended to implement the following measures to minimize the impact for air quality:</p> <ol style="list-style-type: none"> <li>1. Ensure stockpiling sites should be lined with impermeable sheeting and bunded.</li> <li>2. Stockpiles should be fully covered by impermeable sheeting at all time except during working process.</li> <li>3. Ensure the work fulfill the relevant statutory requirements on control of air pollution.</li> <li>4. Take necessary measures to minimize the environmental nuisance arising from the construction site.</li> </ol> <p><u>Action taken</u></p> <p>The exposed surface and stockpile area was covered by the impermeable tarpaulin sheet.</p>	<ul style="list-style-type: none"> <li>- Closed-out on 4 Oct 2021</li> <li>- No further complaint was received.</li> </ul>
C0003	A water discharge complaint was referred from the Contractor on	Complaint of muddy water being discharged into the sea of To Kwa Wan Typhoon Shelter via a DSD outfall near the roundabout of Shing Fung Road.	<p><u>Investigation</u></p> <p>Joint site inspection was conducted by ER, IEC, ET and the contractor on 14 December 2021, no</p>	<ul style="list-style-type: none"> <li>- Closed-out on 5 Jan 2022</li> </ul>

Complaint Log for ED/2018/01				
Complaint Ref. No.	Date of Complaint	Description of Complaint	Investigation / Recommendations / Actions	Close-Out Date / Status
	10 December 2021 through E-Mail regarding a complaint received by EPD (ref.: K19/RE/00029046-21) on 9 December 2021.		<p>adverse observation against the water impact was recorded.</p> <ul style="list-style-type: none"> <li>- There was no muddy water discharge to DSD outfall near the roundabout of Shing Fung Road.</li> <li>- The sand bag with layers and filter were provided at the manholes.</li> </ul> <p><u>Recommendations</u></p> <p>There was no direct evidence showing that the water nuisance was caused by the contractor at the complaint area.</p> <p>Some of muddy water generated from wheel washing might be flow to the outfall inside the site boundary, however the contractor had taken the mitigation measure by using sand bag and filter to ease the nuisance. The contractor is recommended to implement the following measures to minimize the impact for waste water:</p> <ul style="list-style-type: none"> <li>- Enhance the sand bag with several layers instead of one layer only and replace the filter frequently.</li> <li>- Modify the wheel washing area such that the muddy water will be directly flow to the pit and then waste water treatment facility.</li> <li>- Take necessary measures to minimize the environmental nuisance arising from the construction site.</li> </ul> <p><u>Action taken</u></p> <ul style="list-style-type: none"> <li>- Sand bags and filter were used to block the manholes.</li> <li>- Manholes had been adequately covered and replace the filter frequently.</li> </ul>	- No further complaint was received.