

Our ref: 14-6-2021

14-6-2021

By hand

Environmental Protection Department

Environmental Assessment Division

Metro Assessment Group

Kowloon Section (2)

27th floor, Southorn Centre,

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 May 2021**

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 May 2021, which has been certified by the ET leader and 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 May 2021

Ref.: CEDKTDS4EM00\_0\_0157L.21

10 June 2021

AECOM Asia Company Limited  
8/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 May 2021**

Reference is made to the Environmental Team's submission of the Monthly EM&A Report for May 2021 (Version 1.0) certified by the ET Leader and provided to us via email on 10 June 2021.

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. Ronald Siu

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**

May 2021

(Version 1.0)

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

(Environmental Team Leader)

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## EXECUTIVE SUMMARY

1. This is the 17<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 31 May 2021.

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

2. 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.
3. 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.
4. Construction noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.
5. 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**

6. 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	NA	NA	NA	NA

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**

7. 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**

8. There was no reporting change in the reporting month.

**Key construction works in the reporting month**

9. Major construction activities undertaken during the reporting month included:

- North Approach Ramp – Construction of wall, intermediate slab and column
- Bridge D3 – Construction of pile cap and pier
- North Depressed Road – Construction of wall & top slab / dismantling of wailing & strut of cofferdam
- Underpass – Excavation, construction of base slab and backfilling, Construction of wall & top slab
- South Approach Ramp – Installation of sheet pile and excavation, construction of base slab and erection of formwork
- Landscaped Deck – Construction of bored piles
- District Cooling System seawater intake box culvert – Construction of cofferdam and box structure
- Noise barrier – Installation of steel structure and PMMA panel, backfilling of haul road
- Lift 3 – Construction of cofferdam for footing
- Lift 4 – Excavation for footing
- South Depressed Road – Excavation and Installation of Lateral Support works

**Future key issues**

10. 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 wall, intermediate slab and column	Noise and Air Quality
Bridge D3 – Construction of pile cap and pier	Noise and Air Quality
North Depressed Road – Construction of wall & top slab / dismantling of wailing & strut of cofferdam and removal of sheet pile	Noise and Air Quality
Underpass – Excavation, construction of base slab and backfilling, Construction of wall & top slab	Noise and Air Quality
South Approach Ramp – Installation of sheet pile and excavation	Noise and Air Quality
Landscaped Deck – Construction of bored piles	Noise and Air Quality
District Cooling System seawater intake box culvert – Construction of cofferdam and box structure	Noise and Air Quality
Noise barrier – Installation of steel structure and PMMA panel	Noise and Air Quality
Lift 3 – Construction of cofferdam for footing	Noise and Air Quality
Lift 4 – Excavation for footing	Noise and Air Quality

Future key issues in the coming month	Potential impact
South Depressed Road – Excavation and Installation of Lateral Support works	Noise and Air Quality

# 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. Ronald Siu	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 wall, intermediate slab and column	Bridge D3 – Construction of pile cap and pier
North Depressed Road – Construction of wall & top slab / dismantling of wailing & strut of cofferdam	Underpass – Excavation, construction of base slab and backfilling, Construction of wall & top slab
South Approach Ramp – Installation of sheet pile and excavation, construction of base slab and erection of formwork	Landscaped Deck – Construction of bored piles
District Cooling System seawater intake box culvert – Construction of cofferdam and box structure	Noise barrier – Installation of steel structure and PMMA panel, backfilling of haul road
Lift 3 – Construction of cofferdam for footing	Lift 4 – Excavation for footing
South Depressed Road – Excavation and Installation of Lateral Support works	

## **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 Organization of Main Construction Companies	28 May 2020
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 3.2	NA	NA	Baseline Monitoring	2 Jan 2020

EP Condition EP-337/2009	EP Condition EP-445/2013	EP Condition EP-445/2013/A	Submission	Submission Date
			Report	
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 (April 2021)	13 May 2021



## 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  $1.1 \text{ m}^3/\text{min.}$  and  $1.7 \text{ m}^3/\text{min.}$ ) 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  $0.3 \mu\text{m}$  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	30 – 84	182	260
AM4(A)	48	37 – 84	187	260
AM7	48	37 – 72	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	28	15 – 57	297	500
AM4(A)	31	21 – 54	326	500
AM7	35	23 – 56	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 <sub>Aeq</sub> , L <sub>A10</sub> and L <sub>A90</sub>	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	2
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 ^
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 $L_{Aeq, 30\text{-min}}$ , Average, dB(A)	Measured $L_{Aeq, 30\text{-min}}$ , Range, dB(A)	Action Level	Limit Level <sup>^</sup>
M11	68.7	68.4 – 69.3	When one documented complaint is received	75 dB(A)
M12	64.8	62.5 – 65.7		

Note: <sup>^</sup> 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  $L_{Aeq, 30\text{min}}$  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 (May 2021) $\mu\text{g}/\text{m}^3$
		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	30 – 84
AM4(A) - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop	A43 <sup>^</sup>	123	195	37 – 84
AM7 – Hong Kong Children's Hospital	PA60	NA	NA	37 – 72

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 (May 2021) $\mu\text{g}/\text{m}^3$
		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>	15 – 57
AM4(A) - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop	A43	283 <sup>^</sup>	409 <sup>^</sup>	21 – 54
AM7 – Hong Kong Children's Hospital	PA60	NA	NA	23 – 56

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 $L_{Aeq, 30min}$ , dB(A)	Measured Noise Level in Reporting Month (May 2021) $L_{Aeq, 30min}$ , dB(A)
M11 - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop	N18	50 – 76*	68.4 – 69.3
M12 - Hong Kong Children's Hospital	PN83, PN84, PN84A	NA	62.5 – 65.7

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 Scenario 1 (Mid 2009 to Mid 2013) and the Scenario 2 (Mid 2013 to Late 2016) in the EIA Report.
- 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.
- 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.
- 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 6, 12, 20 and 27 May 2021 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
6 May 2021	No	NA	NA
12 May 2021	No	NA	NA
20 May 2021	No	NA	NA
27 May 2021	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 6, 12, 20 and 27 May 2021 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
6 May 2021	 <p>Observation: Chemical waste containers should be suitably labelled.</p>	 <p>Action Taken: Containers were labeled.</p>	Closed-out 12 May 2021
	 <p>Observation: Suitable containers should be used to hold the chemical wastes during storage.</p>	 <p>Action Taken: Secondary container was provided.</p>	
12 May 2021	NA	NA	NA
20 May 2021	NA	NA	NA
27 May 2021	NA	NA	NA

## **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-RE0991-20	26 Nov 2020	25 May 2021
	GW-RE1044-20	10 Dec 2020	01 Jun2021
	GW-RE1074-20	18 Dec 2020	17 Jun 2021
	GW-RE0020-21	15 Jan 2021	11 Jun 2021
	GW-RE0021-21	15 Jan 2021	11 June2021
	GW-RE0360-21	20 Apr 2021	13 Oct 2021
	GW-RE0388-21	28 Apr 2021	27 Oct 2021

## **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	NA	NA	NA	NA

Date of receiving notification of summons or prosecutions	Date of event	Description of event	Action take	Close-out date / Status
of summons and successful prosecutions were received in the reporting 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 wall, intermediate slab and column	Noise and Air Quality
Bridge D3 – Construction of pile cap and pier	Noise and Air Quality
North Depressed Road – Construction of wall & top slab / dismantling of wailing & strut of cofferdam and removal of sheet pile	Noise and Air Quality
Underpass – Excavation, construction of base slab and backfilling, Construction of wall & top slab	Noise and Air Quality
South Approach Ramp – Installation of sheet pile and excavation	Noise and Air Quality
Landscaped Deck – Construction of bored piles	Noise and Air Quality
District Cooling System seawater intake box culvert – Construction of cofferdam and box structure	Noise and Air Quality
Noise barrier – Installation of steel structure and PMMA panel	Noise and Air Quality
Lift 3 – Construction of cofferdam for footing	Noise and Air Quality
Lift 4 – Excavation for footing	Noise and Air Quality

Future key issues in the coming month	Potential impact
South Depressed Road – Excavation and Installation of Lateral Support works	Noise and Air 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**

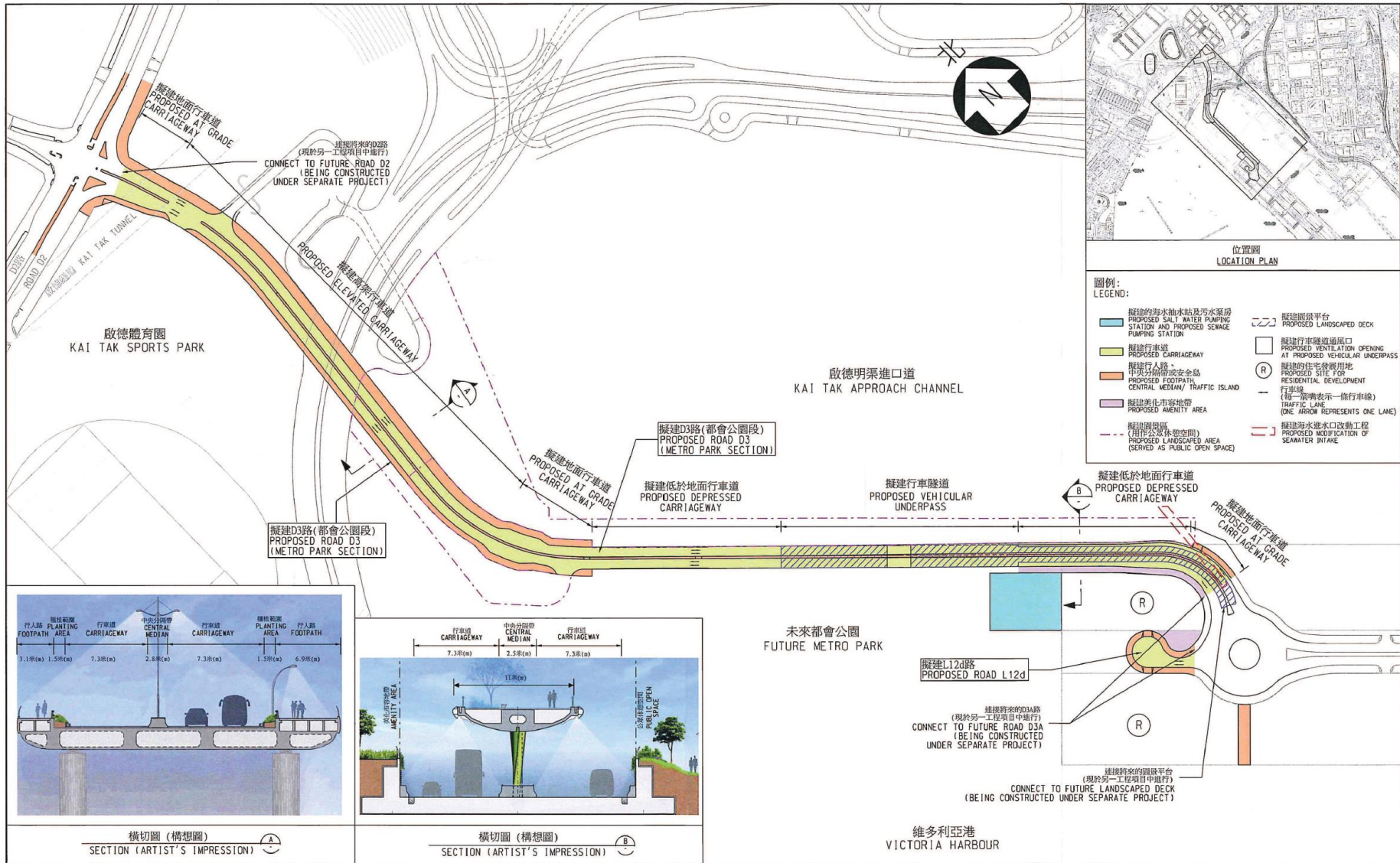


Figure 1 – Proposed works of Contract No. ED/2018/01

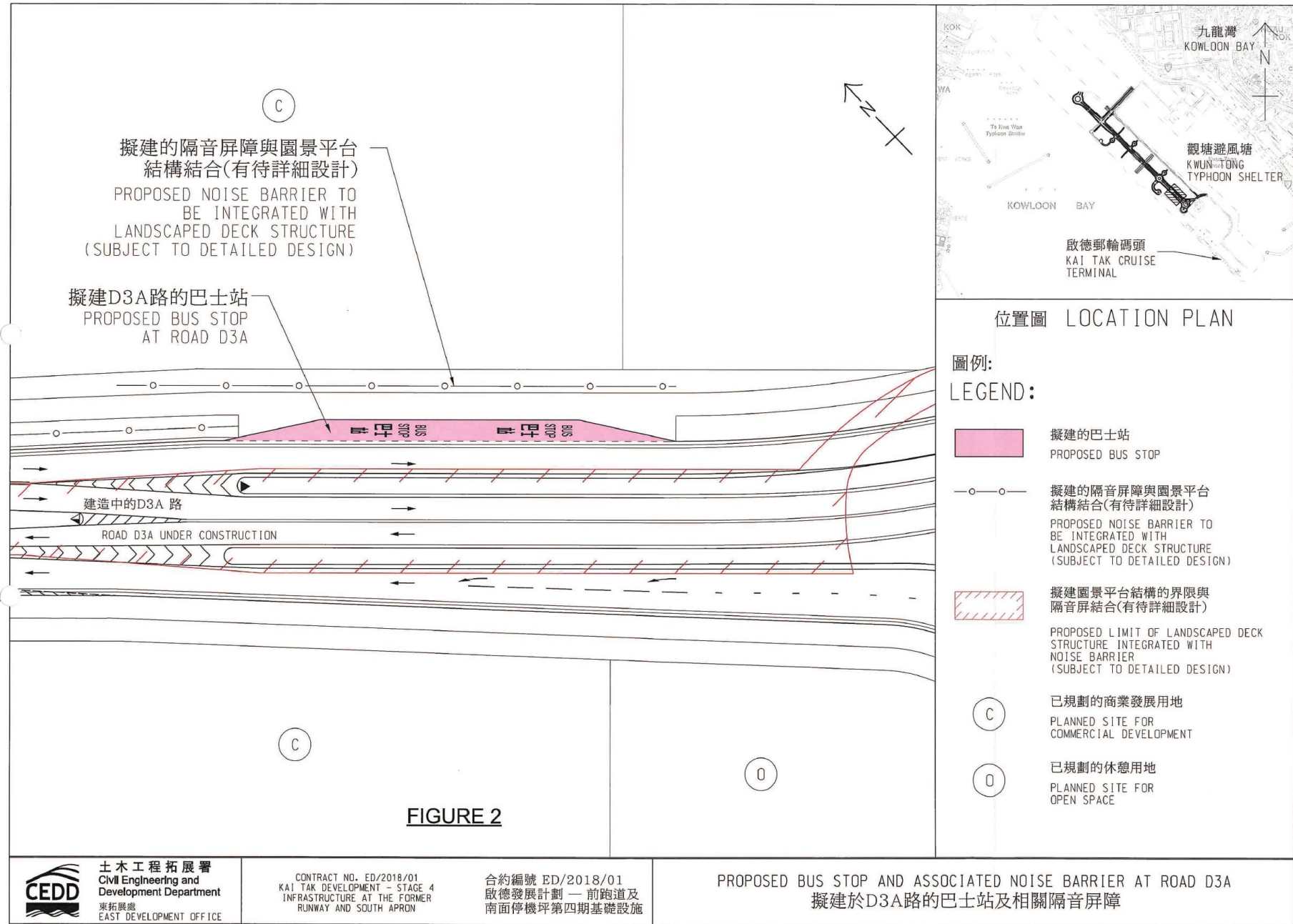
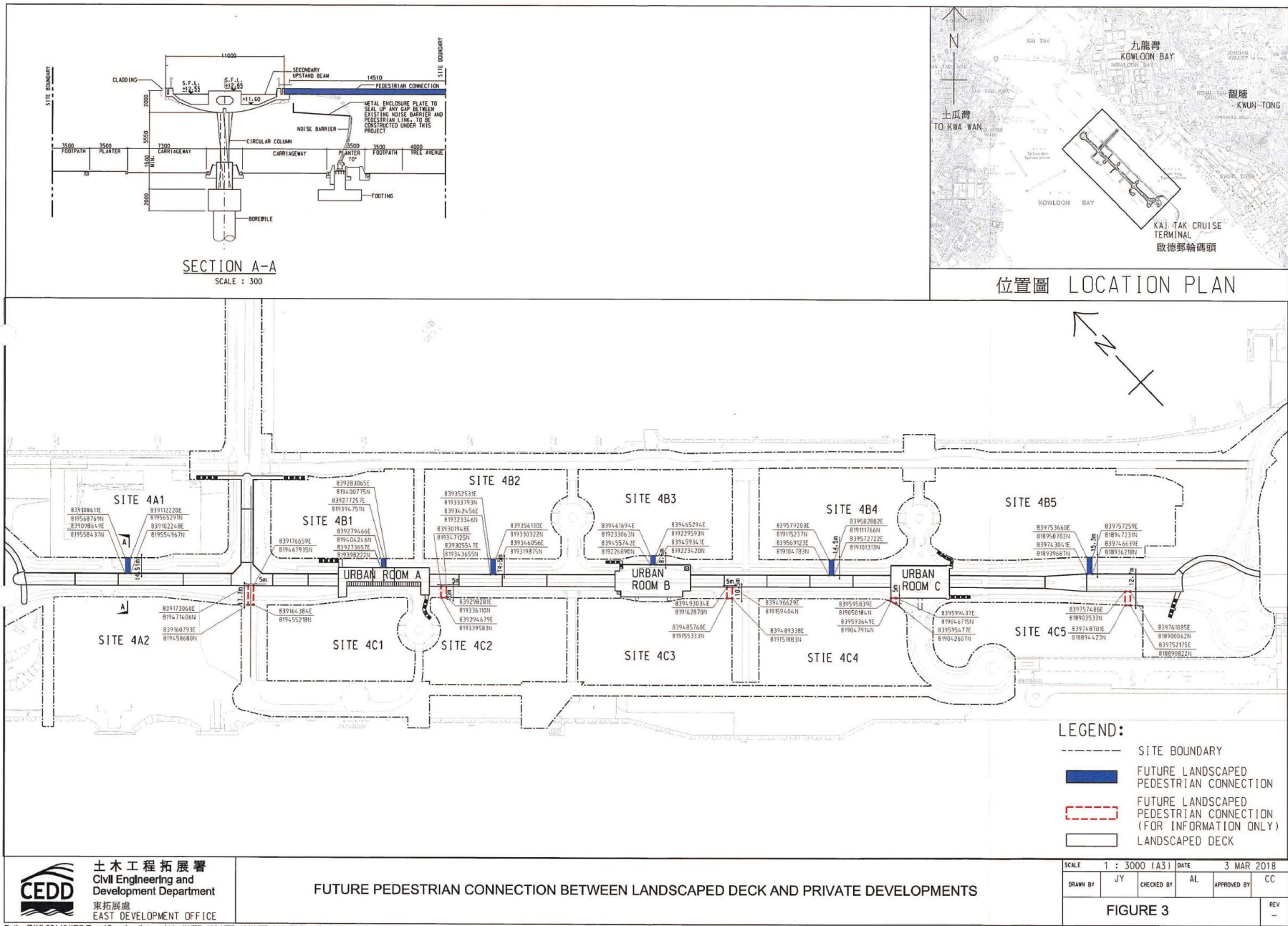


Figure 2 – Proposed Bus Stop And Associated Noise Barrier At Road D3A



Path : Z:\KL2014011TO Team\Drawing (Internal Use)\KTD-400-KTD-499\KTD-414 (PL Location).dgn

Print Date : 7/3/2019

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



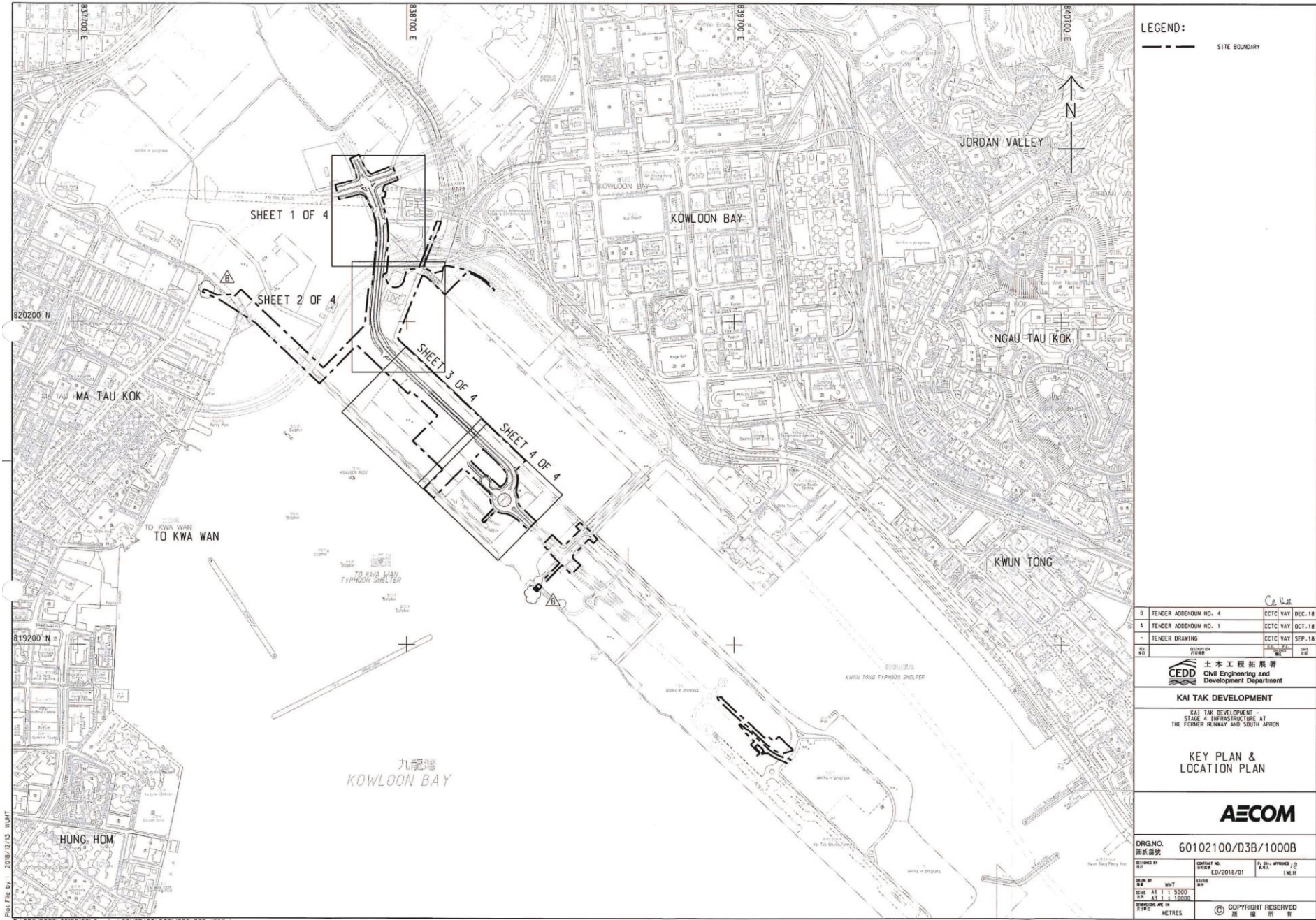


Figure 4 – Site Layout Plan

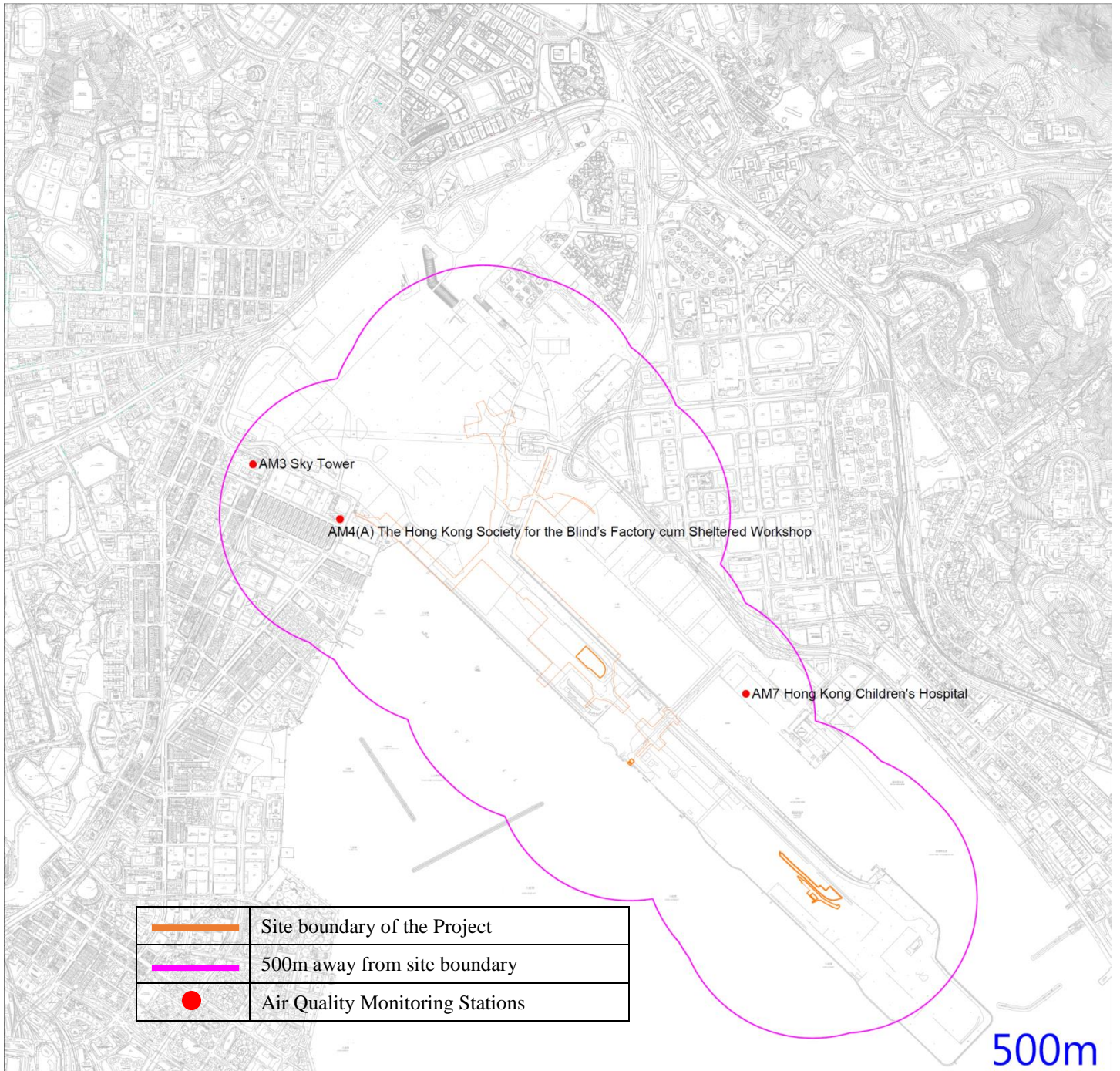


Figure 5 – Air Quality Monitoring Stations

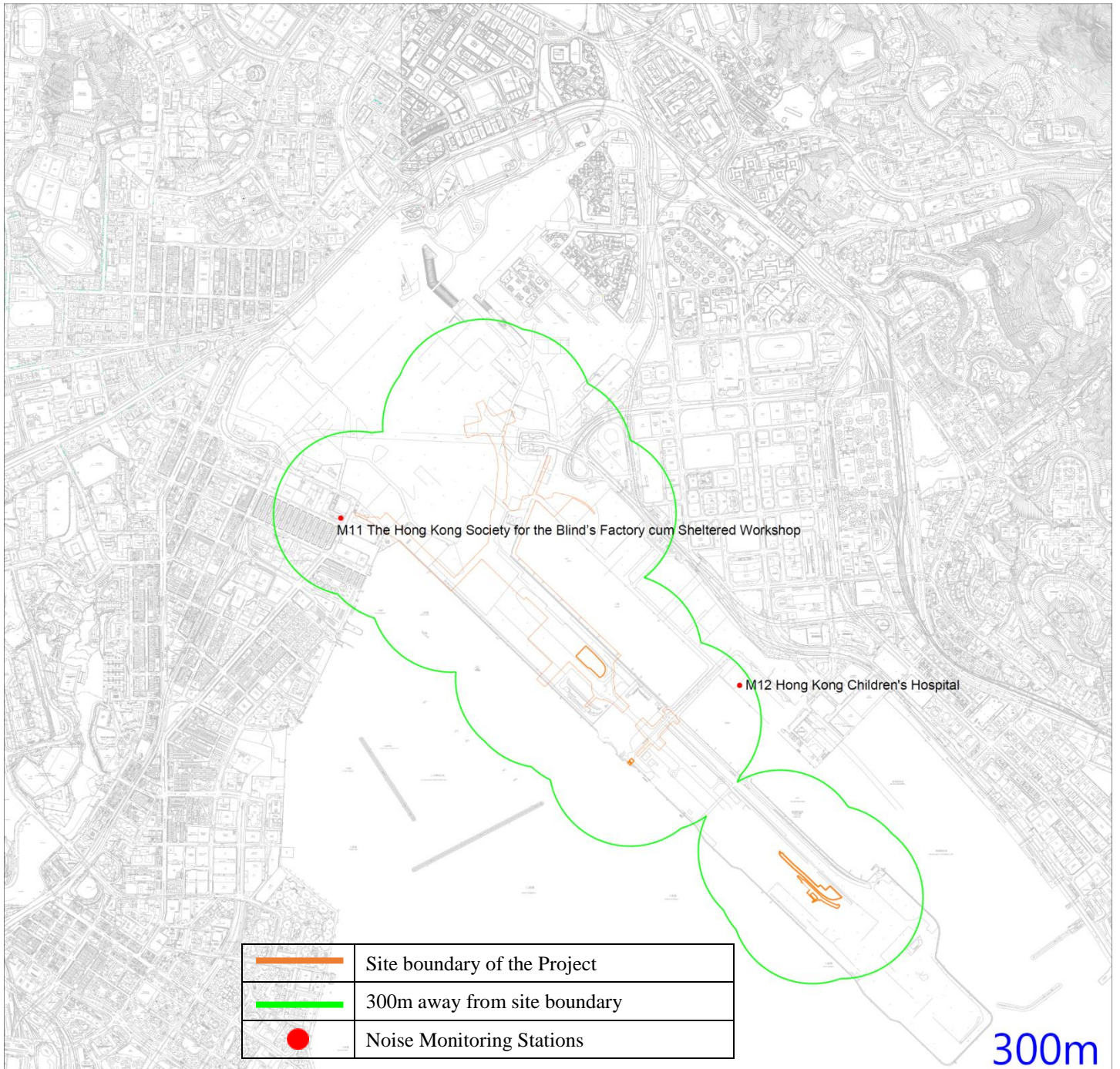
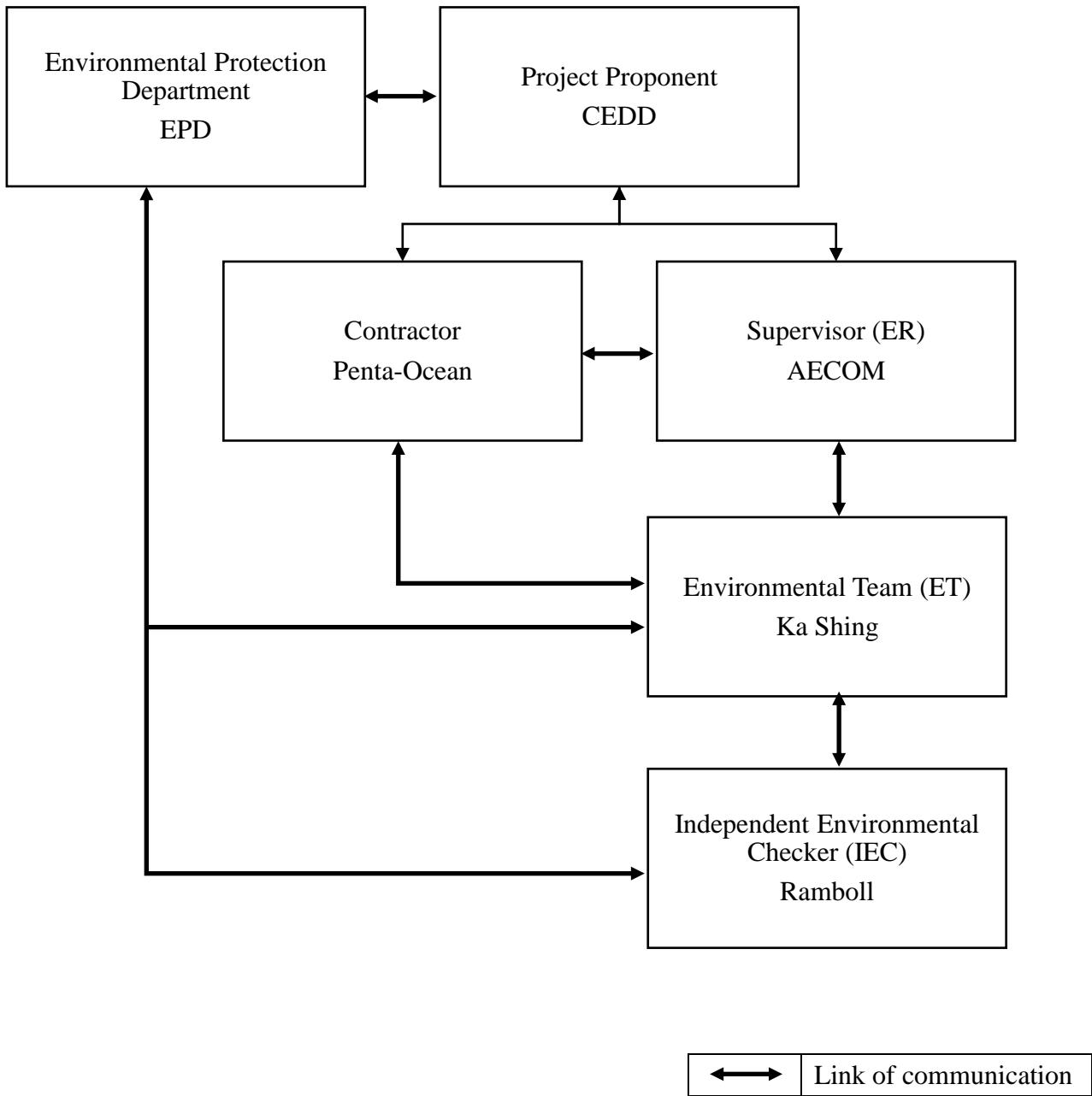


Figure 6 – Noise Monitoring Stations

**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	Q2			
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	Q2	Q3	Q4	Q1
1362	FSD Inspection	0 days	0 days	0 days	0%	Sat 29/4/23	Sat 29/4/23	NA	NA	Thu 11/5/23	Thu 11/5/23	8 days	0.5 days	1361FS+15 days																				
1363	Issuance of FS Certificate	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	8 days	0.5 days	1362FS+15 days																				
1364	Salt Water and Sewage Pumping Station: Landscaping hardworks and softworks	110 days	0 days	110 days	0%	Wed 30/11/22	Sat 15/4/23	NA	NA	Wed 11/1/23	Mon 29/5/23	35 days	2 days	562,1351,548																				
1365	Salt Water and Sewage Pumping Station: Planting Works	110 days	0 days	110 days	0%	Wed 30/11/22	Sat 15/4/23	NA	NA	Wed 11/1/23	Mon 29/5/23	35 days	2 days	562,1351,548																				
1366	Section 6 Completion	0 days	0 days	0 days	0%	Tue 30/5/23	Tue 30/5/23	NA	NA	Tue 30/5/23	Tue 30/5/23	0 days		1350,1363,1364																				
1367	Seawater Intake Box Culvert (~169m)	647 days	0 days	647 days	0%	Fri 5/3/21	Mon 8/5/23	NA	NA	Fri 5/3/21	Tue 30/5/23	0 days																						
1368	Access Date - Part 4	0 days	0 days	0 days	0%	Fri 5/3/21	Fri 5/3/21	NA	NA	Fri 5/3/21	Fri 5/3/21	0 days	0 days	4FS+645 days																				
1369	Part 4 - CHA.0-79 (79m)	290 days	0 days	290 days	0%	Thu 19/5/22	Mon 8/5/23	NA	NA	Fri 10/6/22	Tue 30/5/23	18 days																						
1370	CHA 0-24 Precast Section	34 days	0 days	34 days	0%	Thu 19/5/22	Tue 28/6/22	NA	NA	Fri 10/6/22	Wed 20/7/22	18 days																						
1371	Temporary ELS & Excavation and Shoring Installation	24 days	0 days	24 days	0%	Thu 19/5/22	Thu 16/6/22	NA	NA	Fri 10/6/22	Fri 8/7/22	18 days	1 days	1384,1386,1238																				
1372	Install 3 nos. 8 m long precast units (2.5 days per unit)	10 days	0 days	10 days	0%	Fri 17/6/22	Tue 28/6/22	NA	NA	Sat 9/7/22	Wed 20/7/22	18 days	2.5 days	1371																				
1373	CHA 24-79 (75m) (5 units)	256 days	0 days	256 days	0%	Wed 29/6/22	Mon 8/5/23	NA	NA	Thu 21/7/22	Tue 30/5/23	18 days																						
1374	Temporary ELS & Excavation	50 days	0 days	50 days	0%	Wed 29/6/22	Fri 26/8/22	NA	NA	Thu 21/7/22	Sat 17/9/22	18 days	1 day	1372																				
1375	Unit 1 & 3 (41 days per unit)	44 days	0 days	44 days	0%	Sat 27/8/22	Thu 20/10/22	NA	NA	Mon 19/9/22	Thu 10/11/22	18 days	3 days	1374																				
1376	Unit 2 & 4 (41 days per unit)	44 days	0 days	44 days	0%	Fri 21/10/22	Sat 10/12/22	NA	NA	Fri 11/11/22	Mon 2/1/23	18 days	3 days	1375																				
1377	Unit 5 & 6 (41 days per unit)	44 days	0 days	44 days	0%	Mon 12/12/22	Sat 4/2/23	NA	NA	Tue 3/1/23	Sat 25/2/23	18 days	3 days	1376																				
1378	Remove struts and backfilling	24 days	0 days	24 days	0%	Mon 6/2/23	Sat 4/3/23	NA	NA	Mon 27/2/23	Sat 25/3/23	18 days	1 days	1376,1377																				
1379	Reinstate seawall	50 days	0 days	50 days	0%	Mon 6/3/23	Mon 8/5/23	NA	NA	Mon 27/3/23	Tue 30/5/23	18 days	1 days	1378																				
1380	Part 10 - CHA79-89 (10m)	286 days	0 days	286 days	0%	Wed 2/6/21	Wed 18/5/22	NA	NA	Wed 2/6/21	Thu 9/6/22	0 days																						
1381	Access Date - Part 10	0 days	0 days	0 days	0%	Wed 2/6/21	Wed 2/6/21	NA	NA	Wed 2/6/21	Wed 2/6/21	0 days	0 days	4FS+734 days,1																				
1382	Tempoary Works Design and Method Statement Submission	0 days	0 days	0 days	0%	Sun 2/1/22	Sun 2/1/22	NA	NA	Tue 22/2/22	Tue 22/2/22	40 days																						
1383	Tempoary Works Design and Method Statement Comment by PM	21 days	0 days	21 days	0%	Mon 3/1/22	Wed 26/1/22	NA	NA	Tue 22/2/22	Thu 17/3/22	40 days		1382																				
1384	Temporary ELS & Excavation	14 days	0 days	14 days	0%	Fri 25/2/22	Sat 12/3/22	NA	NA	Fri 18/3/22	Sat 2/4/22	18 days	0 days	1388,1381,1391																				
1385	Box Culvert with Feeder Installation	47 days	0 days	47 days	0%	Mon 14/3/22	Wed 11/5/22	NA	NA	Mon 4/4/22	Wed 1/6/22	18 days	6 days	1384,1381,1391																				
1386	Remove struts and backfilling	6 days	0 days	6 days	0%	Thu 12/5/22	Wed 18/5/22	NA	NA	Thu 2/6/22	Thu 9/6/22	18 days	1 days	1392,1385																				
1387	Part 1 - CH89-165 (76m) 6 Units	193 days	0 days	193 days	0%	Mon 16/8/21	Fri 8/4/22	NA	NA	Mon 6/9/21	Wed 1/6/22	18 days																						
1388	Temporary ELS & Excavation	25 days	0 days	25 days	0%	Mon 16/8/21	Mon 13/9/21	NA	NA	Mon 6/9/21	Wed 6/10/21	18 days	0.5 days	9,1147,1445																				
1389	Unit 1 & 3 (41 days per unit)	44 days	0 days	44 days	0%	Tue 14/9/21	Sat 6/11/21	NA	NA	Thu 7/10/21	Sat 27/11/21	18 days	4 days	1388,418,570																				
1390	Unit 2 & 4 (41 days per unit)	44 days	0 days	44 days	0%	Mon 8/11/21	Thu 30/12/21	NA	NA	Mon 29/11/21	Fri 21/1/22	18 days	4 days	1389																				
1391	Unit 5 & 6 (41 days per unit)	44 days	0 days	44 days	0%	Fri 31/12/21	Thu 24/2/22	NA	NA	Sat 22/1/22	Thu 17/3/22	18 days	4 days	1390																				
1392	Remove struts and backfilling	36 days	0 days	36 days	0%	Fri 25/2/22	Fri 8/4/22	NA	NA	Thu 21/4/22	Wed 1/6/22	43 days	1 days	1390,1391																				
1393	Elevated Landscape Deck CH1920 - 2090	1178 days	11.27 days	1166.74 days?	0%	Thu 16/5/19	Sat 29/4/23	Thu 16/5/19	NA	Thu 16/5/19	Wed 29/5/24	321 da...																						
1394	Agree Interface Coordination Plan with KL/2014/01 Contractor	14 days	14 days	0 days	100%	Thu 16/5/19	Fri 31/5/19	Thu 16/5/19	Fri 31/5/19	Thu 16/5/19	Fri 31/5/19	0 days	0 days																					
1395	Ch1920-CH2060	1 day?	0 days	1 day?	0%	Sat 23/5/20	Sat 23/5/20	NA	NA	Wed 29/5/24	Wed 29/5/24	1467 d...																						
1396	Part 1 - CH1919-2020 (70m) 4 bays	181 days	0 days	181 days	0%	Mon 5/7/21	Thu 10/2/22	NA	NA	Wed 8/9/21	Mon 14/2/22	3 days																						
1397	Pier Temporary Works Design and Method Statement Submission	0 days	0 days	0 days	0%	Mon 5/7/21	Mon 5/7/21	NA	NA	Wed 8/9/21	Wed 8/9/21	65 days	1 day																					
1398	Pier Temporary Works Design and Method Statement Comment & Approval	45 days	0 days	45 days	0%	Mon 5/7/21	Wed 18/8/21	NA	NA	Wed 8/9/21	Fri 22/10/21	65 days	1 day	1397																				
1399	CH1930 Pier (1set x 3nos.):	12 days	0 days	12 days	0%	Tue 5/10/21	Tue 19/10/21	NA	NA	Fri 8/10/21	Fri 22/10/21	3 days		1075,1076,1066																				
1400	CH1950-CH2020: Pier (3sets x 3nos) - 1 day/no.. 1 team	11 days	0 days	11 days	0%	Wed 20/10/21	Mon 1/11/21	NA	NA	Sat 23/10/21	Thu 4/11/21	3 days	2 day	579,1398,1399																				
1401	Falsework Temporary Works Design and Method Statement Submission	0 days	0 days	0 days	0%	Wed 1/9/21	Wed 1/9/21	NA	NA	Tue 21/9/21	Tue 21/9/21	20 days	1 day																					
1402	Falsework Temporary Works Design and Method Statement Comment & Approval	45 days	0 days	45 days	0%	Wed 1/9/21	Fri 15/10/21	NA	NA	Tue 21/9/21	Thu 4/11/21	20 days	1 day	1401																				
1403	Falsework erection	10 days	0 days	10 days	0%	Tue 2/11/21	Fri 12/11/21	NA	NA	Fri 5/11/21	Tue 16/11/21	3 days	1 day	1400,1402																				
1404	Deck & Secondary Upstand Beam Temporary Works Design and Method Statement Submission	0 days	0 days	0 days	0%	Wed 1/9/21	Wed 1/9/21	NA	NA	Sun 3/10/21	Sun 3/10/21	32 days	1 day																					
1405	Deck & Secondary Upstand Beam Temporary Works Design and Method Statement Comment & Approval	45 days	0 days	45 days	0%	Wed 1/9/21	Fri 15/10/21	NA	NA	Sun 3/10/21	Tue 16/11/21	32 days	1 day	1404																				
1406	Deck (4 bays) 12d/bay & link bridge (12d/bay)	25 days	0 days	25 days	0%	Sat 13/11/21	Sat 11/12/21	NA	NA	Wed 17/11/21	Wed 15/12/21	3 days	1 day	1403,625,623FS																				

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							











# **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 May 2021

May 2021

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

**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

Propose Environmental Monitoring and Weekly Site Inspection Schedule for June 2021

June 2021

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3 Weekly Site Inspection	4 24-hr TSP: AM3, AM4(A), AM7 1-hr X3 TSP: AM3, AM4(A), AM7 30-min Noise: M11, M12	5
6	7	8	9	10 Weekly Site Inspection + SSMC meeting 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 24-hr TSP: AM3, AM4(A), AM7 1-hr X3 TSP: AM3, AM4(A), AM7 30-min Noise: M11, M12	17 Weekly Site Inspection	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	24 Weekly Site Inspection	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			

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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Tisch Environmental  
145 S. Miami Ave  
Cleveland, OH 45002  
513-467-9000  
sales@tisch-env.com



## 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-01-2021033102 Date of calibration : 31/03/2021

Location : Sky Tower Sampler : TE-5170X

**Calibration Data**

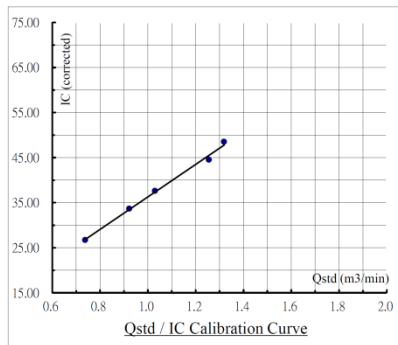
Ambient barometric pressure, Pa = 754.6 ( mmHg ) Ambient temperature, Ta = 302.15 ( deg K )  
Qstd Slope, m = 2.04882 Qstd Intercept, b = -0.011270

**Calibration Curve**

Plate No.	H <sub>2</sub> O ( in )	Qstd ( m <sup>3</sup> / min )	I ( chart )	IC ( corrected )
18	7.40	1.319	49.0	48.49
13	6.70	1.256	45.0	44.53
10	4.50	1.030	38.0	37.60
7	3.60	0.922	34.0	33.65
5	2.30	0.738	27.0	26.72

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1 / m [ ( 1 ) ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	36.037	0.2509	0.9974



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

Form No. INS-HVS-CAL.d4 16 01 2020

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

Calibration curve ref. No. : ATSPC-01-2021033101 Date of calibration : 31/03/2021

The Hong Kong Society for the Blind's

Location : Factory cum Sheltered Workshop Sampler : TE-5170X

**Calibration Data**

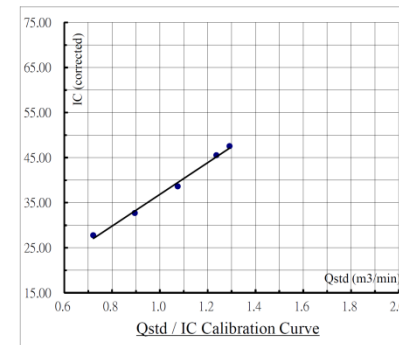
Ambient barometric pressure, Pa = 754.6 ( mmHg ) Ambient temperature, Ta = 302.15 ( deg K )  
Qstd Slope, m = 2.04882 Qstd Intercept, b = -0.011270

**Calibration Curve**

Plate No.	H <sub>2</sub> O ( in )	Qstd ( m <sup>3</sup> / min )	I ( chart )	IC ( corrected )
18	7.10	1.292	48.0	47.50
13	6.50	1.237	46.0	45.52
10	4.90	1.075	39.0	38.59
7	3.40	0.896	33.0	32.66
5	2.20	0.722	28.0	27.71

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1 / m [ ( 1 ) ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	35.191	1.6426	0.9969



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

Form No. INS-HVS-CAL.d4 16 01 2020



# Calibration Certificate for Calibrator



RECALIBRATION DUE DATE: <b>July 17, 2021</b>
--

## Certificate of Calibration

Calibration Certification Information			
Cal. Date: July 17, 2020	Rootsmeter S/N: 438320	Ta: 296 °K	
Operator: Jim Tisch		Pa: 753.4 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	1.4300	3.2	2.00
2	3	4	1	1.0100	6.4	4.00
3	5	6	1	0.9010	7.9	5.00
4	7	8	1	0.8570	8.8	5.50
5	9	10	1	0.7090	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)
0.9937	0.6949	1.4128	0.9958	0.6963	0.8865
0.9895	0.9797	1.9980	0.9915	0.9817	1.2536
0.9875	1.0960	2.2338	0.9895	1.0982	1.4016
0.9863	1.1509	2.3428	0.9883	1.1532	1.4700
0.9810	1.3837	2.8255	0.9830	1.3865	1.7729
<b>QSTD</b>	m=	<b>2.04882</b>	<b>QA</b>	m=	<b>1.28293</b>
	b=	<b>-0.01127</b>		b=	<b>-0.00707</b>
	r=	<b>0.99999</b>		r=	<b>0.99999</b>

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

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

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

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

[www.tisch-env.com](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 AM510

#### 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.


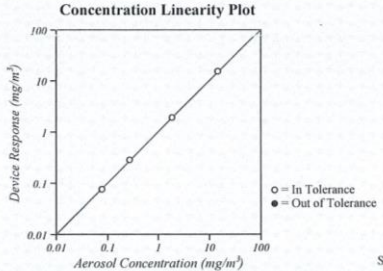
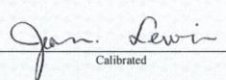
\*\*\*Using Energizer AA-size, E91 alkaline batteries.

### 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)

<b>TSI</b>				<b>CERTIFICATE OF CALIBRATION AND TESTING</b>						
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com										
Environment Conditions			Model		AM510					
Temperature	74.49 (23.6)	°F (°C)	Serial Number		11108001					
Relative Humidity	27.1	%RH								
Barometric Pressure	29.25 (990.5)	inHg (hPa)								
<input checked="" type="checkbox"/> As Left		<input checked="" type="checkbox"/> In Tolerance								
<input type="checkbox"/> As Found		<input type="checkbox"/> Out of Tolerance								
										
System ID: DT1101-02										
CONCENTRATION <span style="float: right;">Unit: mg/m<sup>3</sup></span>										
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE			
1	1.868	1.795	1.681-2.055	3	0.076	0.071	0.053-0.099			
2	0.266	0.266	0.226-0.306	4	14.397	14.344	12.957-15.837			
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 readable mass per standard ISO 12103-1, 21 test dust (Arizona dust). Our calibration ratio is greater than 1:1										
Measurement Variable		System ID	Last Cal.	Cal. Due	Measurement Variable			System ID	Last Cal.	Cal. Due
DC Voltage		E003314	01-15-20	01-31-21	Photometer			E005612	08-19-20	02-28-21
Microbalance		M001324	10-16-20	10-31-22	Pressure			E003511	10-26-20	10-31-21
Flowmeter		E005140	01-09-20	01-31-21	DC Voltage			E003315	01-15-20	01-31-21
				October 30, 2020						
Calibrated				Date						

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

Performance Check ref. No. : AS0210201-2 Report Issue Date: 1/2/2021  
 Date of performance check : 25/1/2021

**Objective:**

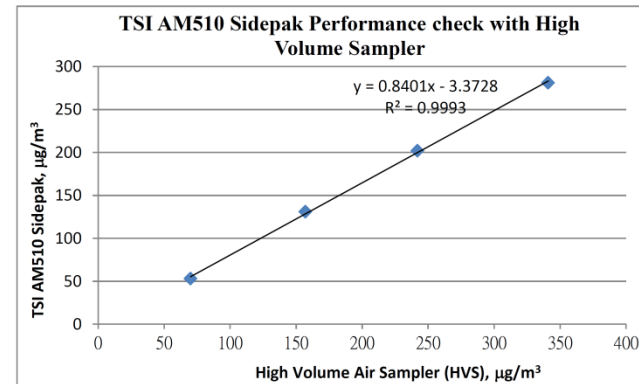
A dust meter and a Total Suspended Particulate High Volume Air Sampler (HVS) were placed together to measure the Total Suspended Particulate (TSP) concentrations simultaneously to check the performance.

**Equipment Used:**

Equipment	Manufacturer and Model	Serial Number
Personal Aerosol Monitor	TSI AM510 Sidepak	11108001
Total Suspended Particulate High Volume Air Sampler	GS2310	10346

**Result:**

Equipment	Measurement Result, µg/m <sup>3</sup>			
TSI AM510 Sidepak	70	157	242	341
High Volume Air Sampler (HVS)	53	131	202	281



Tested by :

Name : ( Poon Tsz Wing )

Checked by :

Name : ( Wong Yin Tong )

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

<b>CERTIFICATE OF CALIBRATION AND TESTING</b> <small>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</small>							
Environment Conditions Temperature 73.79 (23.2) °F (°C) Relative Humidity 45.5 %RH Barometric Pressure 28.97 (981.0) inHg (hPa)		Model <b>AM510</b>  Serial Number <b>11506009</b>					
<input checked="" type="checkbox"/> As Left <input type="checkbox"/> As Found		<input checked="" type="checkbox"/> In Tolerance <input type="checkbox"/> Out of Tolerance					
<b>Concentration Linearity Plot</b> 							
System ID: DT1101-02							
<b>CONCENTRATION</b> <span style="float: right;">Unit: mg/m<sup>3</sup></span>							
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	1.966	1.924	1.769-2.163	3	0.083	0.083	0.058-0.108
2	0.285	0.293	0.242-0.328	4	15.404	15.375	13.864-16.944
<small>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 (Cristom dust). Our calibration ratio is greater than 4:1.</small>							
Measurement Variable    System ID    Last Cal.    Cal. Due DC Voltage                    E003314    01-15-20    01-31-21 Photometer                    E005612    02-25-20    08-31-20 Pressure                        E003511    10-04-19    10-31-20		Measurement Variable    System ID    Last Cal.    Cal. Due DC Voltage                    E003315    01-15-20    01-31-21 Microbalance                    M001324    10-03-18    10-31-20 Flowmeter                        E005140    01-09-20    01-31-21					
July 10, 2020  Calibrated _____ Date _____							

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

Performance Check ref. No. : AS0210201-3      Report Issue Date: 1/2/2021  
 Date of performance check : 25/1/2021

**Objective:**

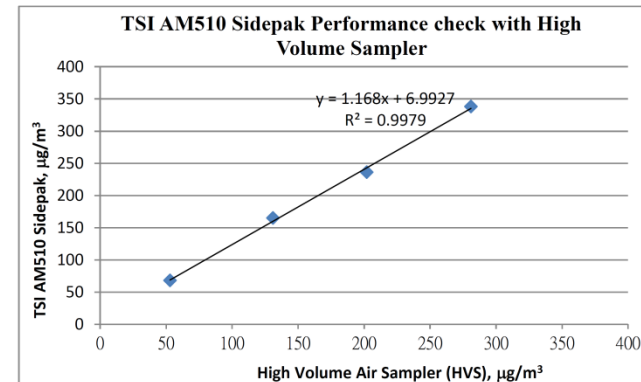
A dust meter and a Total Suspended Particulate High Volume Air Sampler (HVS) were placed together to measure the Total Suspended Particulate (TSP) concentrations simultaneously to check the performance.

**Equipment Used:**

Equipment	Manufacturer and Model	Serial Number
Personal Aerosol Monitor	TSI AM510 Sidepak	11506009
Total Suspended Particulate High Volume Air Sampler	GS2310	10346

**Results:**

Equipment	Measurement Result, µg/m <sup>3</sup>			
TSI AM510 Sidepak	68	165	236	338
High Volume Air Sampler (HVS)	53	131	202	281



Tested by :   
 Name : ( Poon Tsz Wing )

Checked by :   
 Name : ( Wong Yin Tong )



# 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 (60 m/s); at 240' (73 m), the maximum wind speed displayed is 100 mph (34 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

1

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



### Calibration Certificate

**Certificate No.: CC0022012**

**1. Description**

Calibration item :	a) Temperature b) Relative humidity c) Wind Speed d) Wind Direction
Equipment description :	Weather Station
Manufacturer :	Davis Vantage Pro 2
Type / Model No. :	6312CEU
Serial No. :	AY170606003
Assigned equipment no. :	N/A
Adjustment :	N/A
Remark :	Received with good condition

**2. Customer information**

Customer :	Castco Testing Centre Limited
Address :	33, On Kui Street, Fanling, N.T.
Date of receipt :	8 December 2020

**3. Date of performance of the calibration**

Date of calibration :	11 December 2020
-----------------------	------------------

Approved Signatory

Warren Yeung

Company Chop:

Certificate issue date: 15 December 2020



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CT-860-02  
Page 1 of 4  
cc0022012

Cal Lab Limited  
Address: Room 2103, Technology Plaza, 29-35 Sha Tsui Road, Tuen Wan, NT, Hong Kong  
Tel : (852)25680106 Fax(852)30116194 Email : info@calab.com.hk Website:calab.com.hk



**4. Result of Calibration**

**a) Temperature**

Reference reading ; °C	Reading ; °C	Error of indication ; °C
15.0	15	0.0
20.0	20	0.0
25.0	25	0.0
30.0	30	0.0

Estimated expanded uncertainty: 1 °C

Technical Requirement: N/A

Note: The technical requirement is refer to JF 1183-2007

CT-001-04

**b) Relative Humidity**

Temperature setting of humidity chamber : 23 °C

Reference reading ; % RH	Reading ; % RH	Error of indication ; % RH
40.03	41.3	1.3
50.00	52.0	2.0
70.07	72.3	2.3

Estimated expanded uncertainty: 2.5 %RH

Technical Requirement: N/A

Note: The technical requirement is refer to JIS 1076-2001

CT-002-04

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cc0022012

Cal Lab Limited  
Address: Room 2103, Technology Plaza, 29-35 Sha Tsui Road, Tuen Wan, NT, Hong Kong  
Tel : (852)25680106 Fax(852)30116194 Email : info@calab.com.hk Website:calab.com.hk

## Calibration Certificate of Weather Station



### c) Wind Speed

Reference reading ; m/s	Measured reading ; m/s	Error of indication ; %
0.0	0.0	N/A
2.0	2.0	0.0
5.0	4.9	-2.0
10.0	9.8	-2.0
15.0	14.7	-2.0
20.0	19.7	-2.0

Estimated expanded uncertainty: 0.5 m/s      Technical Requirement: +/-5% or 1 m/s

### a) Wind direction

Reference reading	Measured reading	Error of indication
0°	0°	0°
45°	45°	0°
90°	90°	0°
135°	135°	0°
180°	180°	0°
225°	225°	0°
270°	270°	0°
315°	315°	0°

Estimated expanded uncertainty: 5°      Technical Requirement: N/A

Note: The arrow head was adjusted to the magnetic north before performing calibration.

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Page 3 of 4  
cc002012

Cal Lab Limited  
Address: Room 2105, Technology Plaza, 29-35 Sha Tsui Road, Tuen Wan, NT, Hong Kong  
Tel: (852)25680106 Fax: (852)30116194 Email: info@callab.com.hk Website: callab.com.hk



### 5. Reference method for calibration

Temperature	JIF 1183-2007
Relative humidity	JIG 1076-2001
Wind Speed	SCP-251
Wind Direction	SCP-252

### 6. Environment condition of calibration

Temperature ; °C	24.3 °C
Relative humidity ; %RH	48 %RH

### 7. Reference equipment used in the calibration

Item	Model	Serial No.	Expiry date	Traceable to
Platinum resistance thermometer	KPPRHT-A-1	KCI I-1095, KCI P-1095	4 Mar 2022	SMQ
Humidity sensor	KPPRHT-A-1	KCI I-1095, KCI P-1095	4 Mar 2022	SMQ
Reference Anemometer	405-V1	41543692	1 Jan 2021	SMQ

- 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 shown in this calibration certificate relate only to the item calibrated, and the result only applies to the calibration item as received.

Calibrated by: *[Signature]*      Date: 11 December 2020

Checked by: *[Signature]*      Date: 11 December 2020

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

CF-EMD-02

- The certificate shall not reproduced except in full without the written approval of CAL LAB LTD
- The certificate is issued subject to the latest Term and Condition, available assessable at our web site

Cal Lab Limited  
Address: Room 2105, Technology Plaza, 29-35 Sha Tsui Road, Tuen Wan, NT, Hong Kong  
Tel: (852)25680106 Fax: (852)30116194 Email: info@callab.com.hk Website: callab.com.hk

**Appendix F – Weather information**

## General Information

Date	Absolute Daily Min Temperature (°C)	Absolute Daily Max Temperature (°C)	Total Rainfall (mm)
01/05/2021	23.8	30	0
02/05/2021	24.5	30.8	1.2
03/05/2021	23.5	25.4	8.8
04/05/2021	23.1	31.3	12.5
05/05/2021	23.3	31.7	0.5
06/05/2021	23.4	28.6	Trace
07/05/2021	24	30.5	0
08/05/2021	25.4	30.9	0
09/05/2021	26.8	31.7	0
10/05/2021	26.4	31.8	0
11/05/2021	27.7	31.4	Trace
12/05/2021	28.2	32.1	Trace
13/05/2021	28	32	3.9
14/05/2021	28.1	34	0
15/05/2021	27.9	33.8	0
16/05/2021	28.2	33.5	Trace
17/05/2021	28.8	33.3	0
18/05/2021	28.3	32.5	1.3
19/05/2021	28.8	33.5	0
20/05/2021	29.2	33.3	0
21/05/2021	29.5	34	Trace
22/05/2021	27.8	34.3	2.6
23/05/2021	28.9	36.1	Trace
24/05/2021	27.6	31.5	15.7
25/05/2021	27.5	30.1	4.8
26/05/2021	27.8	33.5	4
27/05/2021	28.2	33.2	1
28/05/2021	28.5	33.6	0
29/05/2021	28.8	32.8	0
30/05/2021	29.2	32.3	Trace
31/05/2021	26.7	32.4	8.7

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=2021&m=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
01/05/2021	0:00	1.3	225	02/05/2021	0:00	2.2	247.5	03/05/2021	0:00	1.3	135	04/05/2021	0:00	0.9	112.5
01/05/2021	1:00	0.9	225	02/05/2021	1:00	2.2	202.5	03/05/2021	1:00	1.8	135	04/05/2021	1:00	0.9	112.5
01/05/2021	2:00	1.3	247.5	02/05/2021	2:00	2.2	225	03/05/2021	2:00	0.9	67.5	04/05/2021	2:00	0.9	22.5
01/05/2021	3:00	0.9	247.5	02/05/2021	3:00	1.8	202.5	03/05/2021	3:00	1.3	112.5	04/05/2021	3:00	0.9	112.5
01/05/2021	4:00	0.9	247.5	02/05/2021	4:00	1.3	202.5	03/05/2021	4:00	1.3	67.5	04/05/2021	4:00	1.3	112.5
01/05/2021	5:00	0.9	247.5	02/05/2021	5:00	1.3	202.5	03/05/2021	5:00	1.3	67.5	04/05/2021	5:00	0.9	112.5
01/05/2021	6:00	0.4	247.5	02/05/2021	6:00	1.3	225	03/05/2021	6:00	1.3	337.5	04/05/2021	6:00	0.9	135
01/05/2021	7:00	0.4	247.5	02/05/2021	7:00	1.3	270	03/05/2021	7:00	1.8	135	04/05/2021	7:00	0.9	112.5
01/05/2021	8:00	0.9	112.5	02/05/2021	8:00	1.3	247.5	03/05/2021	8:00	1.3	157.5	04/05/2021	8:00	0.9	135
01/05/2021	9:00	0.4	112.5	02/05/2021	9:00	1.3	225	03/05/2021	9:00	1.3	22.5	04/05/2021	9:00	0.9	135
01/05/2021	10:00	0.9	112.5	02/05/2021	10:00	1.3	180	03/05/2021	10:00	1.8	67.5	04/05/2021	10:00	0.9	112.5
01/05/2021	11:00	0.9	67.5	02/05/2021	11:00	1.8	247.5	03/05/2021	11:00	1.3	90	04/05/2021	11:00	0.9	112.5
01/05/2021	12:00	0.4	22.5	02/05/2021	12:00	1.3	225	03/05/2021	12:00	2.2	45	04/05/2021	12:00	1.3	135
01/05/2021	13:00	0.9	135	02/05/2021	13:00	1.3	202.5	03/05/2021	13:00	1.3	45	04/05/2021	13:00	0.9	135
01/05/2021	14:00	0.9	45	02/05/2021	14:00	1.3	112.5	03/05/2021	14:00	1.8	67.5	04/05/2021	14:00	0.9	112.5
01/05/2021	15:00	0.9	315	02/05/2021	15:00	1.3	112.5	03/05/2021	15:00	1.8	90	04/05/2021	15:00	0.9	135
01/05/2021	16:00	0.4	225	02/05/2021	16:00	1.3	112.5	03/05/2021	16:00	1.8	90	04/05/2021	16:00	0.9	112.5
01/05/2021	17:00	0.4	135	02/05/2021	17:00	1.3	112.5	03/05/2021	17:00	1.3	22.5	04/05/2021	17:00	2.2	112.5
01/05/2021	18:00	0.4	112.5	02/05/2021	18:00	0.9	112.5	03/05/2021	18:00	1.8	112.5	04/05/2021	18:00	1.3	90
01/05/2021	19:00	0.4	112.5	02/05/2021	19:00	0.4	112.5	03/05/2021	19:00	1.3	135	04/05/2021	19:00	0.9	90
01/05/2021	20:00	0.9	90	02/05/2021	20:00	0.4	112.5	03/05/2021	20:00	1.3	112.5	04/05/2021	20:00	1.3	67.5
01/05/2021	21:00	0.4	112.5	02/05/2021	21:00	0.4	112.5	03/05/2021	21:00	1.3	135	04/05/2021	21:00	0.4	90
01/05/2021	22:00	0.4	135	02/05/2021	22:00	0.9	112.5	03/05/2021	22:00	0.9	90	04/05/2021	22:00	0.4	90
01/05/2021	23:00	0.4	135	02/05/2021	23:00	0.9	112.5	03/05/2021	23:00	0.9	67.5	04/05/2021	23:00	0.4	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
05/05/2021	0:00	0.9	112.5	06/05/2021	0:00	2.2	112.5	07/05/2021	0:00	1.3	22.5	08/05/2021	0:00	0.4	202.5
05/05/2021	1:00	0.4	112.5	06/05/2021	1:00	2.2	112.5	07/05/2021	1:00	0.9	337.5	08/05/2021	1:00	0.4	247.5
05/05/2021	2:00	0.4	90	06/05/2021	2:00	2.2	112.5	07/05/2021	2:00	0.9	22.5	08/05/2021	2:00	0.4	225
05/05/2021	3:00	0.4	112.5	06/05/2021	3:00	2.7	67.5	07/05/2021	3:00	0.9	135	08/05/2021	3:00	0.9	247.5
05/05/2021	4:00	0.4	247.5	06/05/2021	4:00	2.7	45	07/05/2021	4:00	0.4	135	08/05/2021	4:00	0.4	247.5
05/05/2021	5:00	0.4	247.5	06/05/2021	5:00	2.7	67.5	07/05/2021	5:00	0.4	247.5	08/05/2021	5:00	0.9	225
05/05/2021	6:00	0.9	247.5	06/05/2021	6:00	2.2	45	07/05/2021	6:00	0.4	247.5	08/05/2021	6:00	0.9	247.5
05/05/2021	7:00	0.9	225	06/05/2021	7:00	2.7	67.5	07/05/2021	7:00	0.4	292.5	08/05/2021	7:00	0.4	247.5
05/05/2021	8:00	0.9	202.5	06/05/2021	8:00	2.2	67.5	07/05/2021	8:00	0.4	292.5	08/05/2021	8:00	0.4	247.5
05/05/2021	9:00	0.9	247.5	06/05/2021	9:00	1.8	45	07/05/2021	9:00	0.4	180	08/05/2021	9:00	0.9	247.5
05/05/2021	10:00	0.4	247.5	06/05/2021	10:00	2.2	67.5	07/05/2021	10:00	0.4	157.5	08/05/2021	10:00	0.9	270
05/05/2021	11:00	0.9	225	06/05/2021	11:00	2.7	292.5	07/05/2021	11:00	0.9	135	08/05/2021	11:00	0.9	247.5
05/05/2021	12:00	0.9	247.5	06/05/2021	12:00	1.3	112.5	07/05/2021	12:00	0.9	247.5	08/05/2021	12:00	0.9	247.5
05/05/2021	13:00	0.4	157.5	06/05/2021	13:00	1.3	90	07/05/2021	13:00	0.9	270	08/05/2021	13:00	0.9	202.5
05/05/2021	14:00	1.3	225	06/05/2021	14:00	1.8	112.5	07/05/2021	14:00	0.9	67.5	08/05/2021	14:00	1.3	225
05/05/2021	15:00	0.4	202.5	06/05/2021	15:00	1.3	90	07/05/2021	15:00	1.3	90	08/05/2021	15:00	1.8	225
05/05/2021	16:00	0.9	270	06/05/2021	16:00	1.3	90	07/05/2021	16:00	0.9	270	08/05/2021	16:00	1.3	247.5
05/05/2021	17:00	0.4	247.5	06/05/2021	17:00	1.3	112.5	07/05/2021	17:00	0.9	225	08/05/2021	17:00	0.9	22.5
05/05/2021	18:00	0.9	247.5	06/05/2021	18:00	1.8	112.5	07/05/2021	18:00	0.9	270	08/05/2021	18:00	0.9	67.5
05/05/2021	19:00	0.4	45	06/05/2021	19:00	1.8	112.5	07/05/2021	19:00	0.9	270	08/05/2021	19:00	0.9	45
05/05/2021	20:00	0.4	292.5	06/05/2021	20:00	1.3	90	07/05/2021	20:00	0.9	270	08/05/2021	20:00	0.9	112.5
05/05/2021	21:00	1.3	135	06/05/2021	21:00	1.3	112.5	07/05/2021	21:00	1.3	247.5	08/05/2021	21:00	0.9	45
05/05/2021	22:00	0.9	45	06/05/2021	22:00	1.3	112.5	07/05/2021	22:00	0.9	202.5	08/05/2021	22:00	0.9	45
05/05/2021	23:00	0.9	90	06/05/2021	23:00	1.8	135	07/05/2021	23:00	0.9	112.5	08/05/2021	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
09/05/2021	0:00	0.4	112.5	10/05/2021	0:00	0.9	90	11/05/2021	0:00	0.9	135	12/05/2021	0:00	0.9	90
09/05/2021	1:00	0.9	337.5	10/05/2021	1:00	0.9	135	11/05/2021	1:00	0.9	90	12/05/2021	1:00	0.9	45
09/05/2021	2:00	1.3	247.5	10/05/2021	2:00	0.4	135	11/05/2021	2:00	0.4	112.5	12/05/2021	2:00	1.3	67.5
09/05/2021	3:00	1.3	225	10/05/2021	3:00	0.4	135	11/05/2021	3:00	0.4	90	12/05/2021	3:00	1.3	45
09/05/2021	4:00	1.3	247.5	10/05/2021	4:00	0.4	90	11/05/2021	4:00	0.9	90	12/05/2021	4:00	1.3	135
09/05/2021	5:00	0.9	247.5	10/05/2021	5:00	0.4	112.5	11/05/2021	5:00	0.9	157.5	12/05/2021	5:00	0.9	157.5
09/05/2021	6:00	0.4	247.5	10/05/2021	6:00	0.4	90	11/05/2021	6:00	0.4	112.5	12/05/2021	6:00	0.9	112.5
09/05/2021	7:00	0.4	225	10/05/2021	7:00	0.4	67.5	11/05/2021	7:00	0.9	112.5	12/05/2021	7:00	0.4	90
09/05/2021	8:00	0.9	247.5	10/05/2021	8:00	0.4	90	11/05/2021	8:00	0.4	112.5	12/05/2021	8:00	0.9	67.5
09/05/2021	9:00	0.9	247.5	10/05/2021	9:00	0.4	90	11/05/2021	9:00	0.4	135	12/05/2021	9:00	0.9	112.5
09/05/2021	10:00	0.9	270	10/05/2021	10:00	0.4	135	11/05/2021	10:00	1.3	157.5	12/05/2021	10:00	0.9	45
09/05/2021	11:00	0.9	247.5	10/05/2021	11:00	0.9	135	11/05/2021	11:00	1.3	90	12/05/2021	11:00	0.4	135
09/05/2021	12:00	0.9	247.5	10/05/2021	12:00	0.9	135	11/05/2021	12:00	1.3	112.5	12/05/2021	12:00	0.9	67.5
09/05/2021	13:00	0.4	247.5	10/05/2021	13:00	1.3	90	11/05/2021	13:00	1.3	67.5	12/05/2021	13:00	0.4	135
09/05/2021	14:00	0.9	225	10/05/2021	14:00	0.9	135	11/05/2021	14:00	0.9	180	12/05/2021	14:00	0.4	67.5
09/05/2021	15:00	0.9	270	10/05/2021	15:00	0.9	67.5	11/05/2021	15:00	0.9	180	12/05/2021	15:00	0.9	67.5
09/05/2021	16:00	0.4	270	10/05/2021	16:00	0.9	112.5	11/05/2021	16:00	1.3	112.5	12/05/2021	16:00	0.9	90
09/05/2021	17:00	0.4	112.5	10/05/2021	17:00	0.4	292.5	11/05/2021	17:00	0.9	45	12/05/2021	17:00	0.9	90
09/05/2021	18:00	0.9	45	10/05/2021	18:00	0.9	67.5	11/05/2021	18:00	0.9	67.5	12/05/2021	18:00	0.9	90
09/05/2021	19:00	0.4	45	10/05/2021	19:00	0.9	90	11/05/2021	19:00	1.3	67.5	12/05/2021	19:00	1.3	67.5
09/05/2021	20:00	0.4	45	10/05/2021	20:00	0.9	45	11/05/2021	20:00	0.9	67.5	12/05/2021	20:00	0.9	67.5
09/05/2021	21:00	0.4	67.5	10/05/2021	21:00	0.4	45	11/05/2021	21:00	0.4	67.5	12/05/2021	21:00	1.3	67.5
09/05/2021	22:00	0.4	45	10/05/2021	22:00	0.9	22.5	11/05/2021	22:00	0.9	45	12/05/2021	22:00	0.9	67.5
09/05/2021	23:00	0.4	45	10/05/2021	23:00	0.9	67.5	11/05/2021	23:00	0.4	90	12/05/2021	23:00	0.4	45



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
13/05/2021	0:00	0.9	112.5	14/05/2021	0:00	0.9	112.5	15/05/2021	0:00	0.9	112.5	16/05/2021	0:00	0.9	45
13/05/2021	1:00	0.9	112.5	14/05/2021	1:00	0.9	112.5	15/05/2021	1:00	0.9	67.5	16/05/2021	1:00	0.9	135
13/05/2021	2:00	0.4	112.5	14/05/2021	2:00	0.9	112.5	15/05/2021	2:00	0.9	67.5	16/05/2021	2:00	0.9	135
13/05/2021	3:00	0.4	112.5	14/05/2021	3:00	0.4	90	15/05/2021	3:00	0.9	45	16/05/2021	3:00	0.9	22.5
13/05/2021	4:00	1.3	135	14/05/2021	4:00	0.4	112.5	15/05/2021	4:00	1.3	90	16/05/2021	4:00	0.9	45
13/05/2021	5:00	1.3	135	14/05/2021	5:00	0.4	135	15/05/2021	5:00	0.9	90	16/05/2021	5:00	0.9	45
13/05/2021	6:00	1.3	112.5	14/05/2021	6:00	0.4	112.5	15/05/2021	6:00	0.9	67.5	16/05/2021	6:00	1.3	90
13/05/2021	7:00	1.3	90	14/05/2021	7:00	0.9	112.5	15/05/2021	7:00	0.9	90	16/05/2021	7:00	0.9	90
13/05/2021	8:00	1.8	112.5	14/05/2021	8:00	0.9	112.5	15/05/2021	8:00	0.9	90	16/05/2021	8:00	0.9	67.5
13/05/2021	9:00	1.3	112.5	14/05/2021	9:00	1.3	67.5	15/05/2021	9:00	0.9	90	16/05/2021	9:00	0.9	90
13/05/2021	10:00	1.3	112.5	14/05/2021	10:00	1.3	157.5	15/05/2021	10:00	0.9	112.5	16/05/2021	10:00	0.9	90
13/05/2021	11:00	0.4	112.5	14/05/2021	11:00	1.3	112.5	15/05/2021	11:00	0.9	90	16/05/2021	11:00	0.9	112.5
13/05/2021	12:00	0.4	112.5	14/05/2021	12:00	1.3	112.5	15/05/2021	12:00	0.9	67.5	16/05/2021	12:00	0.9	67.5
13/05/2021	13:00	0.4	112.5	14/05/2021	13:00	1.3	112.5	15/05/2021	13:00	0.9	90	16/05/2021	13:00	0.9	67.5
13/05/2021	14:00	0.4	112.5	14/05/2021	14:00	1.8	112.5	15/05/2021	14:00	0.9	22.5	16/05/2021	14:00	0.9	67.5
13/05/2021	15:00	0.4	112.5	14/05/2021	15:00	1.3	112.5	15/05/2021	15:00	0.4	90	16/05/2021	15:00	0.9	67.5
13/05/2021	16:00	0.9	112.5	14/05/2021	16:00	1.8	112.5	15/05/2021	16:00	0.4	67.5	16/05/2021	16:00	0.9	22.5
13/05/2021	17:00	0.9	112.5	14/05/2021	17:00	0.9	112.5	15/05/2021	17:00	0.4	90	16/05/2021	17:00	1.3	67.5
13/05/2021	18:00	1.3	112.5	14/05/2021	18:00	0.9	90	15/05/2021	18:00	0.4	112.5	16/05/2021	18:00	0.9	67.5
13/05/2021	19:00	0.9	112.5	14/05/2021	19:00	0.9	90	15/05/2021	19:00	0.9	45	16/05/2021	19:00	0.9	67.5
13/05/2021	20:00	1.3	112.5	14/05/2021	20:00	0.9	90	15/05/2021	20:00	0.9	90	16/05/2021	20:00	0.9	22.5
13/05/2021	21:00	1.3	112.5	14/05/2021	21:00	0.9	112.5	15/05/2021	21:00	0.9	67.5	16/05/2021	21:00	1.3	45
13/05/2021	22:00	0.9	112.5	14/05/2021	22:00	0.9	90	15/05/2021	22:00	0.4	135	16/05/2021	22:00	1.3	45
13/05/2021	23:00	0.9	157.5	14/05/2021	23:00	0.9	112.5	15/05/2021	23:00	0.9	67.5	16/05/2021	23:00	0.9	45

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
17/05/2021	0:00	0.9	112.5	18/05/2021	0:00	0.9	225	19/05/2021	0:00	0.4	112.5	20/05/2021	0:00	1.3	67.5
17/05/2021	1:00	0.9	45	18/05/2021	1:00	0.4	112.5	19/05/2021	1:00	0.9	112.5	20/05/2021	1:00	0.9	45
17/05/2021	2:00	0.4	90	18/05/2021	2:00	0.9	67.5	19/05/2021	2:00	0.4	112.5	20/05/2021	2:00	0.9	67.5
17/05/2021	3:00	0.9	67.5	18/05/2021	3:00	0.4	135	19/05/2021	3:00	0.9	90	20/05/2021	3:00	0.9	45
17/05/2021	4:00	0.9	112.5	18/05/2021	4:00	0.4	157.5	19/05/2021	4:00	0.4	67.5	20/05/2021	4:00	1.3	67.5
17/05/2021	5:00	0.9	90	18/05/2021	5:00	0.4	157.5	19/05/2021	5:00	0.4	45	20/05/2021	5:00	0.9	112.5
17/05/2021	6:00	0.9	67.5	18/05/2021	6:00	0.4	112.5	19/05/2021	6:00	0.4	112.5	20/05/2021	6:00	1.3	112.5
17/05/2021	7:00	0.4	90	18/05/2021	7:00	0.4	112.5	19/05/2021	7:00	0.4	180	20/05/2021	7:00	1.3	90
17/05/2021	8:00	0.4	22.5	18/05/2021	8:00	0.4	112.5	19/05/2021	8:00	0.4	270	20/05/2021	8:00	1.3	67.5
17/05/2021	9:00	0.9	157.5	18/05/2021	9:00	0.9	180	19/05/2021	9:00	0.4	45	20/05/2021	9:00	1.3	112.5
17/05/2021	10:00	0.9	112.5	18/05/2021	10:00	0.9	112.5	19/05/2021	10:00	0.9	45	20/05/2021	10:00	1.8	67.5
17/05/2021	11:00	0.4	112.5	18/05/2021	11:00	0.4	90	19/05/2021	11:00	0.9	90	20/05/2021	11:00	1.3	67.5
17/05/2021	12:00	0.4	112.5	18/05/2021	12:00	0.4	135	19/05/2021	12:00	0.4	45	20/05/2021	12:00	0.9	67.5
17/05/2021	13:00	0.4	112.5	18/05/2021	13:00	0.4	90	19/05/2021	13:00	0.4	135	20/05/2021	13:00	0.9	67.5
17/05/2021	14:00	0.4	67.5	18/05/2021	14:00	0.4	90	19/05/2021	14:00	0.9	247.5	20/05/2021	14:00	1.8	22.5
17/05/2021	15:00	0.9	45	18/05/2021	15:00	0.4	112.5	19/05/2021	15:00	0.9	270	20/05/2021	15:00	0.9	90
17/05/2021	16:00	0.4	90	18/05/2021	16:00	0.9	112.5	19/05/2021	16:00	0.9	45	20/05/2021	16:00	0.4	90
17/05/2021	17:00	0.9	135	18/05/2021	17:00	0.4	180	19/05/2021	17:00	0.9	67.5	20/05/2021	17:00	0.4	45
17/05/2021	18:00	0.9	135	18/05/2021	18:00	0.4	270	19/05/2021	18:00	0.9	45	20/05/2021	18:00	0.9	45
17/05/2021	19:00	0.9	112.5	18/05/2021	19:00	0.4	135	19/05/2021	19:00	1.3	45	20/05/2021	19:00	0.4	67.5
17/05/2021	20:00	0.9	45	18/05/2021	20:00	0.4	90	19/05/2021	20:00	1.3	45	20/05/2021	20:00	0.4	45
17/05/2021	21:00	0.9	90	18/05/2021	21:00	0.9	67.5	19/05/2021	21:00	1.3	247.5	20/05/2021	21:00	0.4	45
17/05/2021	22:00	0.9	112.5	18/05/2021	22:00	0.4	135	19/05/2021	22:00	1.3	270	20/05/2021	22:00	0.9	270
17/05/2021	23:00	0.9	90	18/05/2021	23:00	0.9	90	19/05/2021	23:00	1.3	112.5	20/05/2021	23:00	0.9	45

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
21/05/2021	0:00	0.9	135	22/05/2021	0:00	1.3	112.5	23/05/2021	0:00	1.3	67.5	24/05/2021	0:00	0.9	112.5
21/05/2021	1:00	0.4	112.5	22/05/2021	1:00	1.3	90	23/05/2021	1:00	0.9	90	24/05/2021	1:00	0.9	112.5
21/05/2021	2:00	0.4	67.5	22/05/2021	2:00	1.8	67.5	23/05/2021	2:00	1.3	90	24/05/2021	2:00	0.9	135
21/05/2021	3:00	0.9	45	22/05/2021	3:00	0.9	45	23/05/2021	3:00	0.9	112.5	24/05/2021	3:00	0.9	112.5
21/05/2021	4:00	0.9	45	22/05/2021	4:00	0.9	45	23/05/2021	4:00	0.9	22.5	24/05/2021	4:00	0.9	112.5
21/05/2021	5:00	0.9	67.5	22/05/2021	5:00	1.8	67.5	23/05/2021	5:00	1.3	112.5	24/05/2021	5:00	0.9	90
21/05/2021	6:00	0.9	270	22/05/2021	6:00	1.8	45	23/05/2021	6:00	1.3	135	24/05/2021	6:00	1.3	112.5
21/05/2021	7:00	0.4	225	22/05/2021	7:00	1.3	45	23/05/2021	7:00	1.3	112.5	24/05/2021	7:00	1.3	112.5
21/05/2021	8:00	0.9	225	22/05/2021	8:00	1.3	67.5	23/05/2021	8:00	1.3	112.5	24/05/2021	8:00	1.3	112.5
21/05/2021	9:00	0.9	292.5	22/05/2021	9:00	1.8	157.5	23/05/2021	9:00	0.9	135	24/05/2021	9:00	0.9	112.5
21/05/2021	10:00	0.9	247.5	22/05/2021	10:00	1.8	67.5	23/05/2021	10:00	1.3	90	24/05/2021	10:00	0.9	112.5
21/05/2021	11:00	0.9	270	22/05/2021	11:00	1.8	67.5	23/05/2021	11:00	1.3	112.5	24/05/2021	11:00	0.9	90
21/05/2021	12:00	0.9	270	22/05/2021	12:00	1.8	90	23/05/2021	12:00	1.3	112.5	24/05/2021	12:00	0.9	90
21/05/2021	13:00	0.9	67.5	22/05/2021	13:00	1.3	112.5	23/05/2021	13:00	1.3	112.5	24/05/2021	13:00	1.3	112.5
21/05/2021	14:00	0.9	67.5	22/05/2021	14:00	0.4	90	23/05/2021	14:00	1.3	112.5	24/05/2021	14:00	1.3	112.5
21/05/2021	15:00	0.9	112.5	22/05/2021	15:00	0.9	112.5	23/05/2021	15:00	2.2	112.5	24/05/2021	15:00	0.9	135
21/05/2021	16:00	0.9	90	22/05/2021	16:00	0.9	67.5	23/05/2021	16:00	1.8	112.5	24/05/2021	16:00	0.9	112.5
21/05/2021	17:00	0.4	90	22/05/2021	17:00	0.9	90	23/05/2021	17:00	1.8	112.5	24/05/2021	17:00	0.4	112.5
21/05/2021	18:00	0.9	112.5	22/05/2021	18:00	1.3	135	23/05/2021	18:00	1.8	112.5	24/05/2021	18:00	0.9	112.5
21/05/2021	19:00	1.3	45	22/05/2021	19:00	0.9	90	23/05/2021	19:00	0.9	67.5	24/05/2021	19:00	0.4	112.5
21/05/2021	20:00	0.9	67.5	22/05/2021	20:00	0.4	90	23/05/2021	20:00	0.9	112.5	24/05/2021	20:00	0.4	112.5
21/05/2021	21:00	0.9	135	22/05/2021	21:00	0.4	112.5	23/05/2021	21:00	0.9	112.5	24/05/2021	21:00	0.9	135
21/05/2021	22:00	0.9	90	22/05/2021	22:00	0.4	90	23/05/2021	22:00	0.4	112.5	24/05/2021	22:00	0.9	112.5
21/05/2021	23:00	0.9	67.5	22/05/2021	23:00	0.4	67.5	23/05/2021	23:00	0.4	112.5	24/05/2021	23:00	0.9	112.5

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
25/05/2021	0:00	0.9	90	26/05/2021	0:00	0.4	45	27/05/2021	0:00	1.3	45	28/05/2021	0:00	0.9	270
25/05/2021	1:00	0.9	45	26/05/2021	1:00	1.3	45	27/05/2021	1:00	1.8	45	28/05/2021	1:00	1.3	225
25/05/2021	2:00	0.9	112.5	26/05/2021	2:00	1.3	45	27/05/2021	2:00	1.8	45	28/05/2021	2:00	1.3	247.5
25/05/2021	3:00	0.9	135	26/05/2021	3:00	0.9	90	27/05/2021	3:00	1.3	45	28/05/2021	3:00	0.9	270
25/05/2021	4:00	1.3	135	26/05/2021	4:00	0.4	90	27/05/2021	4:00	1.3	45	28/05/2021	4:00	1.3	247.5
25/05/2021	5:00	1.3	135	26/05/2021	5:00	0.4	135	27/05/2021	5:00	1.3	67.5	28/05/2021	5:00	0.9	247.5
25/05/2021	6:00	0.9	112.5	26/05/2021	6:00	0.4	180	27/05/2021	6:00	1.8	45	28/05/2021	6:00	0.9	247.5
25/05/2021	7:00	1.3	112.5	26/05/2021	7:00	0.4	135	27/05/2021	7:00	1.3	45	28/05/2021	7:00	0.9	247.5
25/05/2021	8:00	0.9	112.5	26/05/2021	8:00	0.4	225	27/05/2021	8:00	1.3	67.5	28/05/2021	8:00	1.3	247.5
25/05/2021	9:00	0.9	112.5	26/05/2021	9:00	0.4	270	27/05/2021	9:00	1.3	45	28/05/2021	9:00	1.3	247.5
25/05/2021	10:00	0.9	112.5	26/05/2021	10:00	0.9	135	27/05/2021	10:00	1.3	45	28/05/2021	10:00	0.9	247.5
25/05/2021	11:00	1.3	112.5	26/05/2021	11:00	0.9	157.5	27/05/2021	11:00	1.3	225	28/05/2021	11:00	0.9	247.5
25/05/2021	12:00	0.9	112.5	26/05/2021	12:00	0.9	225	27/04/2021	12:00	1.3	270	28/05/2021	12:00	0.9	247.5
25/05/2021	13:00	0.9	112.5	26/05/2021	13:00	0.9	67.5	27/05/2021	13:00	0.9	112.5	28/05/2021	13:00	1.3	247.5
25/05/2021	14:00	1.3	112.5	26/05/2021	14:00	1.3	90	27/05/2021	14:00	0.9	112.5	28/05/2021	14:00	1.8	247.5
25/05/2021	15:00	1.3	112.5	26/05/2021	15:00	0.9	225	27/05/2021	15:00	1.3	112.5	28/05/2021	15:00	1.8	270
25/05/2021	16:00	0.9	112.5	26/05/2021	16:00	0.9	112.5	27/05/2021	16:00	1.3	112.5	28/05/2021	16:00	1.8	225
25/05/2021	17:00	0.9	112.5	26/05/2021	17:00	0.9	45	27/05/2021	17:00	1.3	112.5	28/05/2021	17:00	0.9	247.5
25/05/2021	18:00	0.9	90	26/05/2021	18:00	1.3	270	27/05/2021	18:00	0.9	112.5	28/05/2021	18:00	0.9	247.5
25/05/2021	19:00	1.3	67.5	26/05/2021	19:00	1.3	112.5	27/05/2021	19:00	0.9	112.5	28/05/2021	19:00	0.9	270
25/05/2021	20:00	0.9	90	26/05/2021	20:00	0.4	90	27/05/2021	20:00	1.3	112.5	28/05/2021	20:00	0.9	247.5
25/05/2021	21:00	0.9	112.5	26/05/2021	21:00	0.4	45	27/05/2021	21:00	0.9	247.5	28/05/2021	21:00	1.3	270
25/05/2021	22:00	0.9	112.5	26/05/2021	22:00	0.9	45	27/05/2021	22:00	0.9	112.5	28/05/2021	22:00	0.9	315
25/05/2021	23:00	1.3	112.5	26/05/2021	23:00	1.3	90	27/05/2021	23:00	1.3	112.5	28/0/2021	23:00	0.9	45

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
29/05/2021	0:00	1.3	90	30/05/2021	0:00	1.8	135	31/05/2021	0:00	2.7	112.5				
29/05/2021	1:00	1.3	90	30/05/2021	1:00	1.3	135	31/05/2021	1:00	3.1	247.5				
29/05/2021	2:00	1.8	112.5	30/05/2021	2:00	2.2	90	31/05/2021	2:00	2.7	247.5				
29/05/2021	3:00	1.3	112.5	30/05/2021	3:00	2.7	45	31/05/2021	3:00	2.7	247.5				
29/05/2021	4:00	1.3	112.5	30/05/2021	4:00	2.7	45	31/05/2021	4:00	1.8	247.5				
29/05/2021	5:00	1.3	112.5	30/05/2021	5:00	1.8	45	31/05/2021	5:00	2.2	225				
29/05/2021	6:00	1.3	112.5	30/05/2021	6:00	1.3	45	31/05/2021	6:00	2.7	247.5				
29/05/2021	7:00	0.9	112.5	30/05/2021	7:00	2.2	22.5	31/05/2021	7:00	2.7	270				
29/05/2021	8:00	1.3	112.5	30/05/2021	8:00	2.2	45	31/05/2021	8:00	2.7	247.5				
29/05/2021	9:00	0.9	112.5	30/05/2021	9:00	1.3	45	31/05/2021	9:00	3.1	247.5				
29/05/2021	10:00	1.3	112.5	30/05/2021	10:00	0.9	45	31/05/2021	10:00	2.2	247.5				
29/05/2021	11:00	2.2	112.5	30/05/2021	11:00	2.2	67.5	31/05/2021	11:00	1.8	247.5				
29/05/2021	12:00	1.3	112.5	30/05/2021	12:00	2.7	22.5	31/05/2021	12:00	0.9	247.5				
29/05/2021	13:00	0.9	135	30/05/2021	13:00	2.7	247.5	31/05/2021	13:00	0.9	247.5				
29/05/2021	14:00	0.9	135	30/05/2021	14:00	2.2	270	31/05/2021	14:00	1.3	225				
29/05/2021	15:00	0.9	135	30/05/2021	15:00	1.8	247.5	31/05/2021	15:00	0.9	270				
29/05/2021	16:00	1.3	135	30/05/2021	16:00	0.9	45	31/05/2021	16:00	1.3	270				
29/05/2021	17:00	0.9	112.5	30/05/2021	17:00	1.3	270	31/05/2021	17:00	0.9	270				
29/05/2021	18:00	0.9	112.5	30/05/2021	18:00	1.8	247.5	31/05/2021	18:00	1.3	270				
29/05/2021	19:00	0.9	112.5	30/05/2021	19:00	2.7	45	31/05/2021	19:00	2.7	247.5				
29/05/2021	20:00	0.9	112.5	30/05/2021	20:00	1.8	247.5	31/05/2021	20:00	1.8	270				
29/05/2021	21:00	0.9	112.5	30/05/2021	21:00	1.8	270	31/05/2021	21:00	0.9	247.5				
29/05/2021	22:00	1.3	67.5	30/05/2021	22:00	1.8	270	31/05/2021	22:00	1.3	247.5				
29/05/2021	23:00	0.9	247.5	30/05/2021	23:00	1.3	247.5	31/05/2021	23:00	1.3	292.5				

# **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			
06/05/2021	Sunny	28	1015.4	11.6437	11.8161	0.1724	2899.25	2923.28	1442	52	52	1.43	2062	84
12/05/2021	Sunny	31.1	1008.3	11.6750	11.7375	0.0625	2924.51	2948.53	1441	52	52	1.42	2043	31
18/05/2021	Sunny	33.8	1009.2	11.6665	11.7272	0.0607	2949.71	2973.73	1441	52	52	1.41	2035	30
24/05/2021	Cloudy	29.6	1009.6	11.6847	11.7726	0.0879	2974.34	2998.36	1441	52	52	1.42	2050	43
29/05/2021	Cloudy	32.2	1007.1	11.7478	11.8133	0.0655	2999.09	3023.11	1441	52	52	1.41	2039	32
													Maximum	84
													Minimum	30
													Average	44
													Action Level	182
													Limit Level	260

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

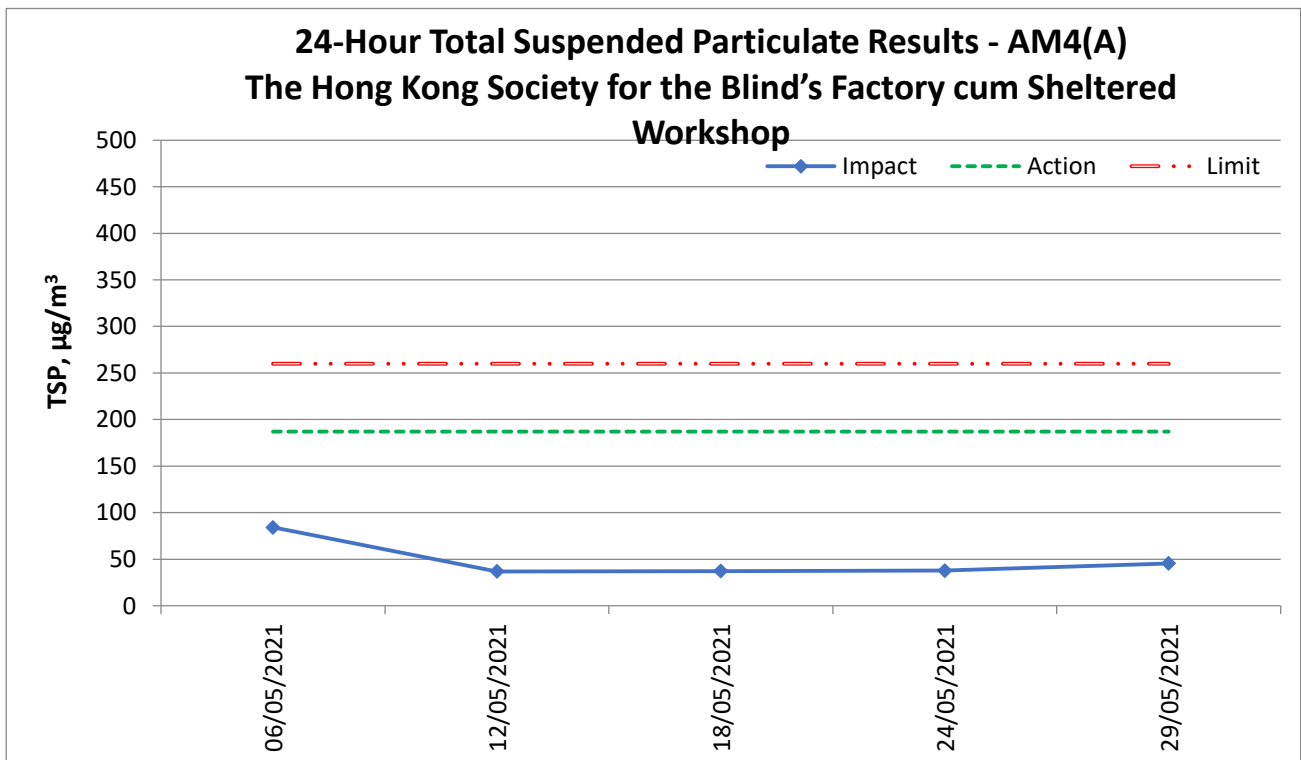
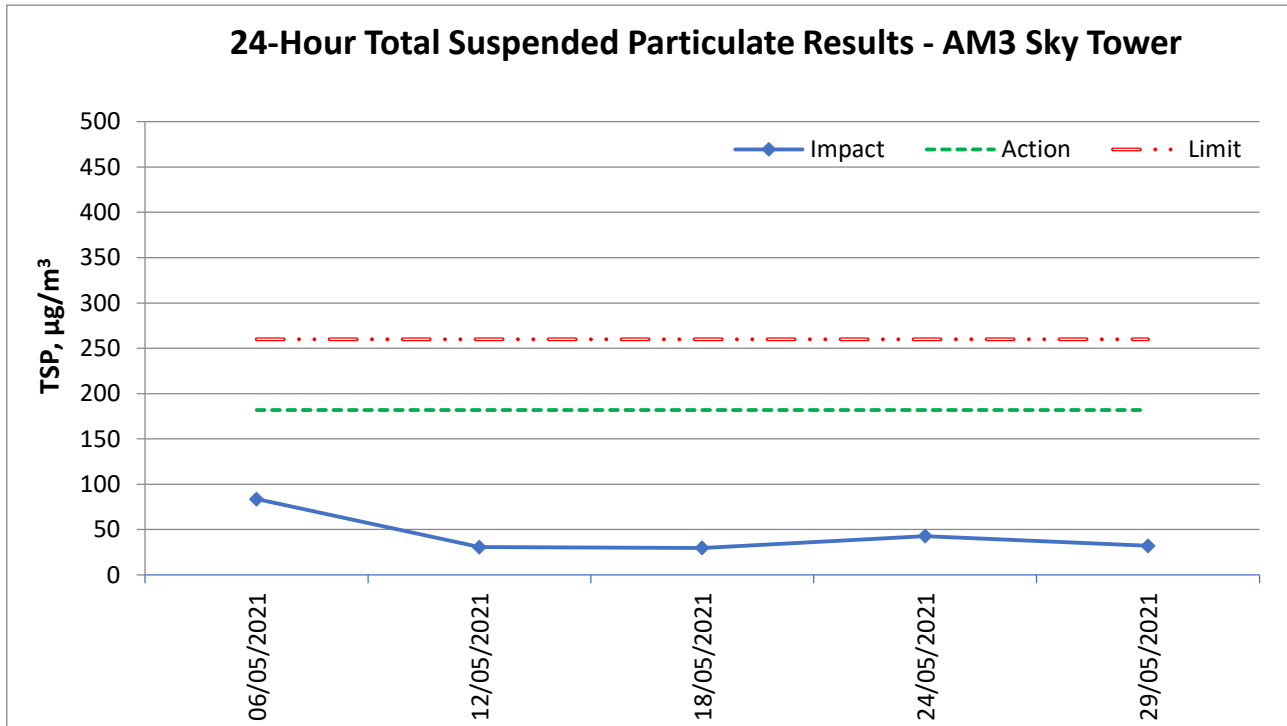
Start Date	Weather	Air Temp. (°C)	Atmospheric Pressure (hPa)	Filter weight (g)		Particulate weight (g)	Elapse Time		Sampling Time (min)	Flow Rate (cfm)		Av. Flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
				Initial	Final		Initial	Final		Initial	Final			
06/05/2021	Sunny	28	1015.4	15.8298	15.9957	0.1659	2542.58	2566.6	1441	50	50	1.37	1972	84
12/05/2021	Sunny	31.1	1008.3	18.3703	18.4393	0.0690	2566.86	2590.88	1441	48	48	1.30	1874	37
18/05/2021	Sunny	33.8	1009.2	11.6303	11.7028	0.0725	2591.22	2615.24	1441	50	50	1.35	1947	37
24/05/2021	Cloudy	29.6	1009.6	11.6105	11.6843	0.0738	2616.28	2640.29	1441	50	50	1.36	1960	38
29/05/2021	Cloudy	32.2	1007.1	18.1603	18.2489	0.0886	2641.33	2665.35	1441	50	50	1.35	1950	45
													Maximum	84
													Minimum	37
													Average	48
													Action Level	187
													Limit Level	260

Location: AM7 – Hong Kong Children’s Hospital

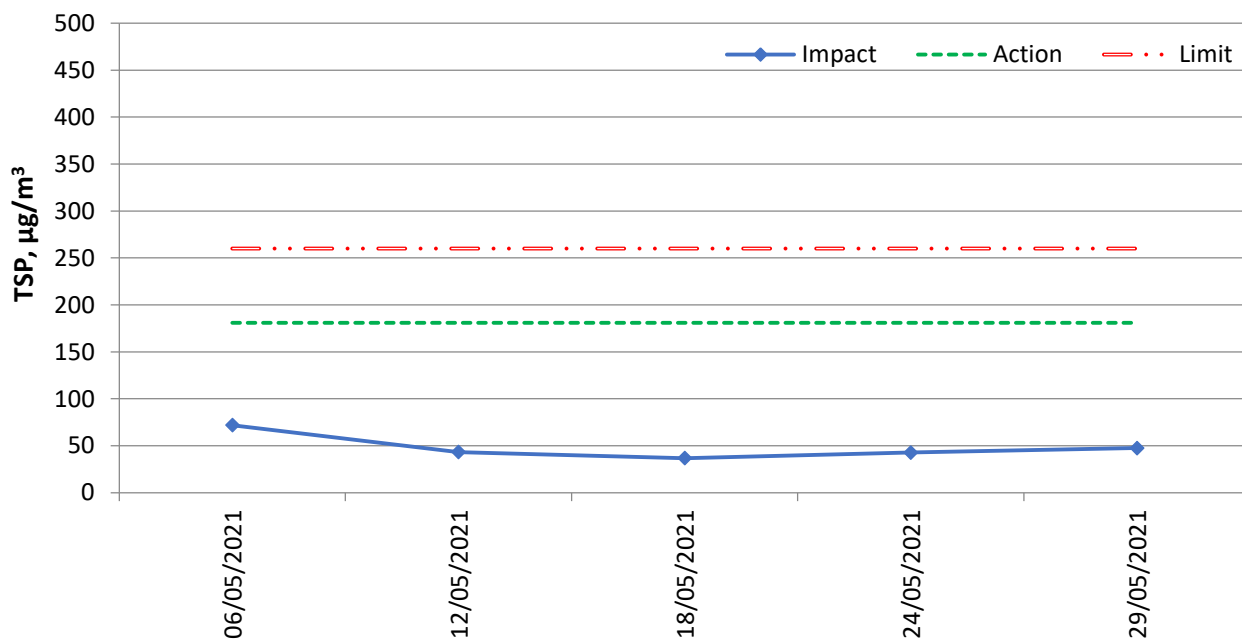
Start Date	Weather	Air Temp. (°C)	Atmospheric Pressure (hPa)	Filter weight (g)		Particulate weight (g)	Elapse Time		Sampling Time (min)	Flow Rate (cfm)		Av. Flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
				Initial	Final		Initial	Final		Initial	Final			
06/05/2021	Sunny	28	1015.4	18.5106	18.6462	0.1356	7446.01	7470.04	1442	48	48	1.31	1884	72
12/05/2021	Sunny	31.1	1008.3	18.5436	18.6175	0.0739	7472.81	7496.83	1441	44	44	1.19	1710	43
18/05/2021	Sunny	33.8	1009.2	11.7711	11.8397	0.0686	7497.12	7521.15	1442	48	48	1.29	1861	37
24/05/2021	Cloudy	29.6	1009.6	11.6165	11.6965	0.0800	7521.26	7545.28	1441	48	48	1.30	1873	43
29/05/2021	Cloudy	32.2	1007.1	18.4983	18.5944	0.0961	7545.45	7569.48	1442	52	52	1.40	2020	48
													Maximum	72
													Minimum	37
													Average	48
													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
6/5/2021	9:00	-	10:00	44	Sunny
	10:00	-	11:00	50	
	11:00	-	12:00	57	
12/5/2021	9:00	-	10:00	21	Sunny
	10:00	-	11:00	22	
	11:00	-	12:00	24	
18/5/2021	13:00	-	14:00	18	Sunny
	14:00	-	15:00	19	
	15:00	-	16:00	22	
24/5/2021	13:00	-	14:00	27	Cloudy
	14:00	-	15:00	29	
	15:00	-	16:00	35	
29/5/2021	9:00	-	10:00	15	Cloudy
	10:00	-	11:00	16	
	11:00	-	12:00	20	
Maximum				57	
Minimum				15	
Average				28	
Action Level				297	
Limit Level				500	

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

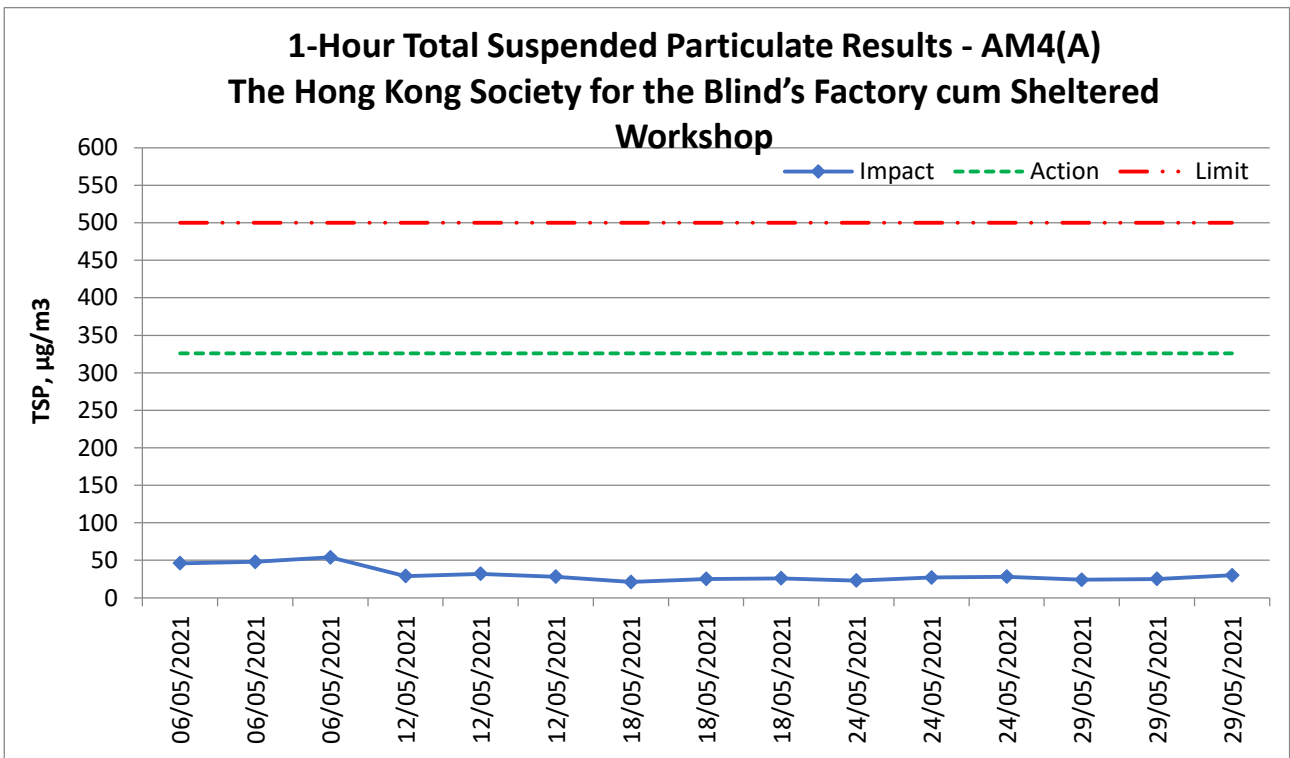
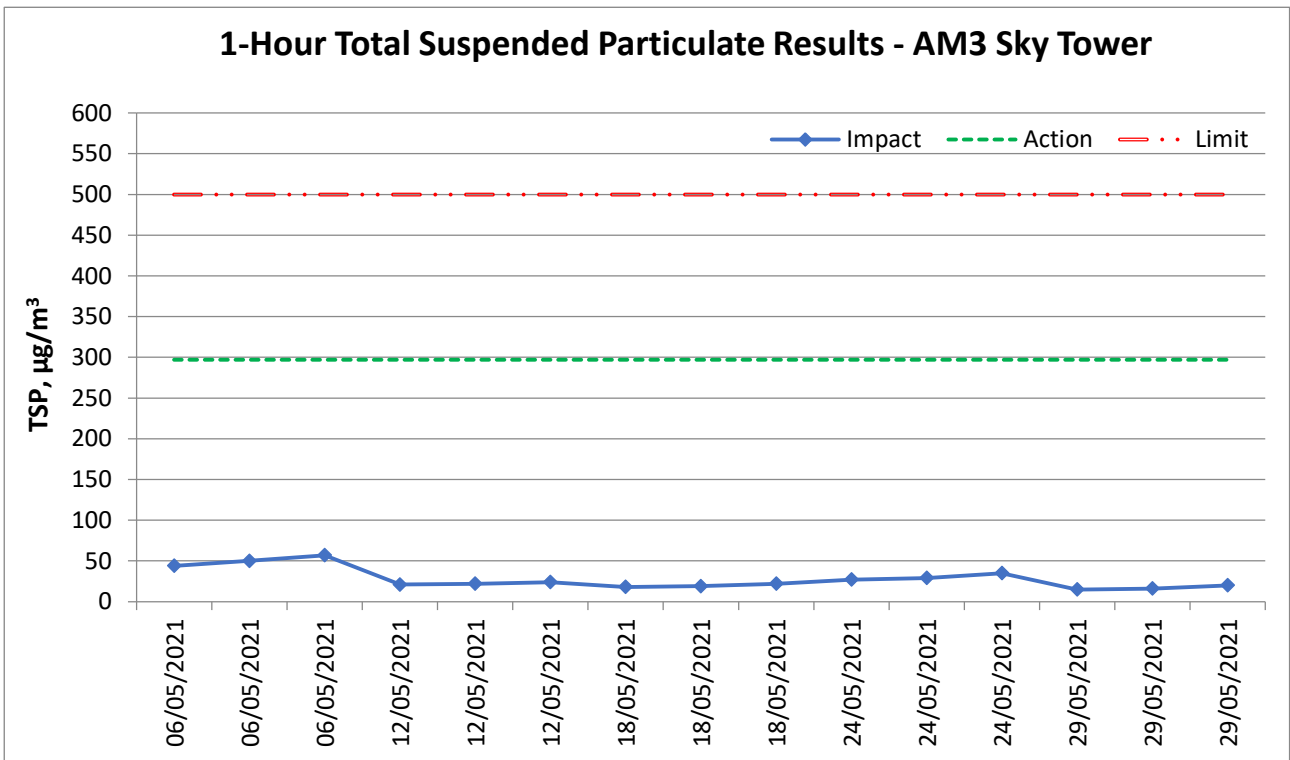
Date	Measurement Period			1-hr TSP concentration, $\mu\text{g}/\text{m}^3$	Weather
6/5/2021	9:00	-	10:00	46	Sunny
	10:00	-	11:00	48	
	11:00	-	12:00	54	
12/5/2021	14:30	-	15:30	29	Sunny
	15:30	-	16:30	32	
	16:30	-	17:30	28	
18/5/2021	9:00	-	10:00	21	Sunny
	10:00	-	11:00	25	
	11:00	-	12:00	26	
24/5/2021	13:00	-	14:00	23	Cloudy
	14:00	-	15:00	27	
	15:00	-	16:00	28	
29/5/2021	9:00	-	10:00	24	Cloudy
	10:00	-	11:00	25	
	11:00	-	12:00	30	
Maximum				54	
Minimum				21	
Average				31	
Action Level				326	
Limit Level				500	

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

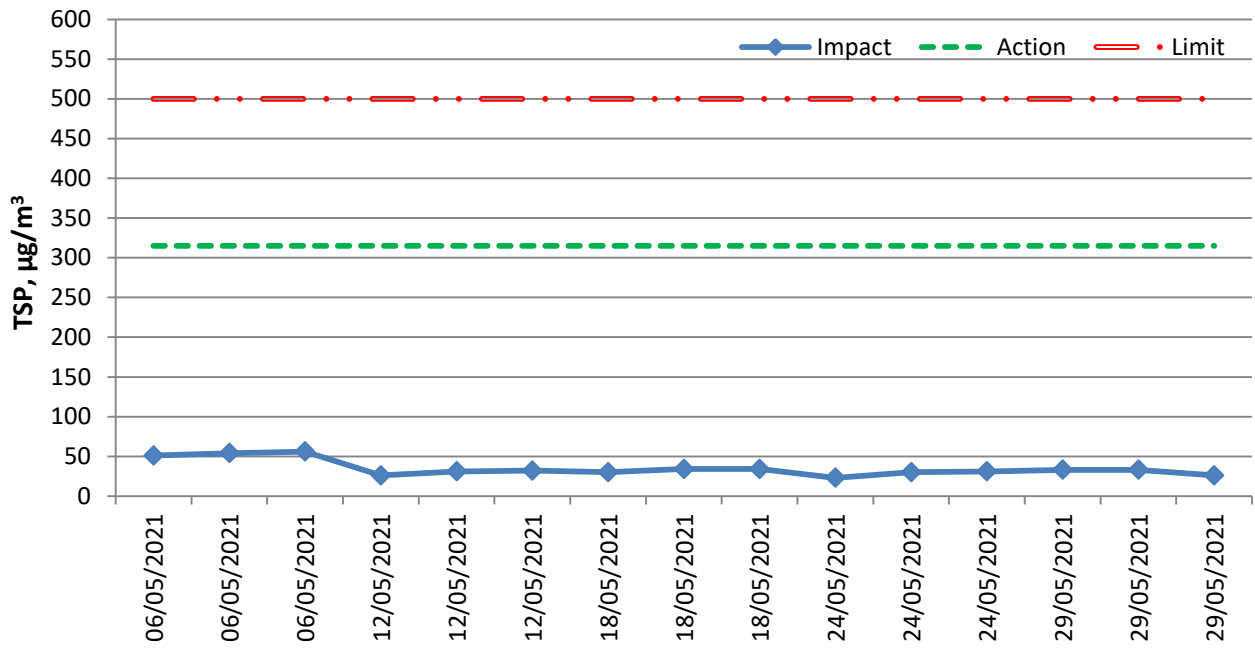
**Kong**

Date	Measurement Period			1-hr TSP concentration, μg/m <sup>3</sup>	Weather
		-			
6/5/2021	13:00	-	14:00	51	Sunny
	14:00	-	15:00	54	
	15:00	-	16:00	56	
12/5/2021	9:45	-	10:45	26	Sunny
	10:45	-	11:45	31	
	13:00	-	14:00	32	
18/5/2021	13:00	-	14:00	30	Sunny
	14:00	-	15:00	34	
	15:00	-	16:00	34	
24/5/2021	9:00	-	10:00	23	Cloudy
	10:00	-	11:00	30	
	11:00	-	12:00	31	
29/5/2021	13:00	-	14:00	33	Cloudy
	14:00	-	15:00	33	
	15:00	-	16:00	26	
Maximum				56	
Minimum				23	
Average				35	
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.

Distributed by:

This product is environment-friendly. It does not include toxic chemicals on our policy.  
This product is certified as an International Protection rating of IP54 (dust protected and resistant to splashing water).  
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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 *3	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



**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: 2HB20001172-0003  
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	2020-07-15	校准日期: Cal. Date	2020-07-20
签发日期: App. Date	2020-07-20	建议校准周期: Reference Cal. Period	12个月(12 Months)
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: 广州天河区东莞路110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  
H.Q. Addr: No.110,Dongguanzhuang Road,Tianhe District,Guangzhou  
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.): 2HB20001172-0003

## 说明 DIRECTIONS

1. 本机构质量管理体系符合ISO/IEC 17025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 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。(Please see the attachment of certificate No. L13344 at CNAS website for details, beyond which is not accredited).

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)
数字多用表	4GC19040017-0001/2020-11-03/赛宝	DCV: ±0.0035%; ACV: ±0.06%; DCI: ±0.05% ; ACI: ±0.1%; R: ±0.01%; f: ±0.01%
步进衰减器	4GC20000158-0012/2021-04-29/赛宝	±3dB
标准传声器	GFJGJL1001200310164/2021-02-26/航空304所	U=(0.05-0.12)dB (k=2)
声校准器	4GC19040146-0209/2020-12-29/赛宝	1级
正弦信号发生器	4GC19040057-0001/2020-11-05/赛宝	f: ±1mHz; 失真度: < 70dB
PULSE分析系统	4GC20000009-0001/2021-01-08/赛宝	频率: U <sub>freq</sub> =0.001%, k=2; 电压: U <sub>amp</sub> =0.04%, k=2
前置放大器	GFJGJL1001200310165/2021-02-26/航空304所	U=0.3dB (k=2)

4. 校准地点(The calibration place):  
广州市天河区东莞庄路110号401楼振动声学室

5. 环境条件(Environmental conditions):  
温度(Temperature): 24°C 相对湿度(Relative Humidity): 60%

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"。本证书报告的判定规则和结论仅供参考, 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". The judgment rules and 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建议校准周期。  
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 Level Meter



证书编号(Certificate No.): 2HB20001172-0003

### 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	12132	NH-25	76320

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	94.0	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):	-0.2 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):	-0.2 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):	-0.2 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.): 2HB20001172-0003

### 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	-50.7	-50.5	-0.2	+2.0	P	0.5
25	-45.0	-44.7	-0.3	+2.0 ~ -1.5	P	0.5
31.5	-39.5	-39.4	-0.1	+1.5	P	0.5
40	-34.5	-34.6	0.1	+1.0	P	0.5
50	-30.2	-30.2	0.0	+1.0	P	0.5
63	-26.1	-26.2	0.1	+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	-16.1	-16.1	0.0	+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	-3.2	-3.2	0.0	+1.0	P	0.4
630	-1.8	-1.9	0.1	+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	0.9	1.0	-0.1	+1.0	P	0.6
2000	1.1	1.2	-0.1	+1.0	P	0.6
2500	1.1	1.3	-0.2	+1.0	P	0.6
3150	1.0	1.2	-0.2	+1.0	P	0.6
4000	0.7	1.0	-0.3	+1.0	P	0.6
5000	0.3	0.5	-0.2	+1.5	P	0.6
6300	-0.2	-0.1	-0.1	+1.5 ~ -2.0	P	0.6
8000	-1.1	-1.1	0.0	+1.5 ~ -2.5	P	0.6
10000	-2.3	-2.5	0.2	+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	-18.4	-9.3	-9.1	+3.0 ~ -∞	P	1.0

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## Calibration Certificate of Sound Level Meter



证书编号(Certificate No.): 2HB20001172-0003

### 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 (k=2) (dB)
20	-6.6	-6.2	-0.4	±2.0	P	0.5
25	-4.6	-4.4	-0.2	+2.0 ~ -1.5	P	0.5
31.5	-3.1	-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	-0.8	-0.8	0.0	±1.0	P	0.5
80	-0.4	-0.5	0.1	±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	0.0	-0.1	0.1	±1.0	P	0.5
200	0.0	0.0	0.0	±1.0	P	0.5
250	0.1	0.0	0.1	±1.0	P	0.5
315	0.1	0.0	0.1	±1.0	P	0.4
400	0.1	0.0	0.1	±1.0	P	0.4
500	0.1	0.0	0.1	±1.0	P	0.4
630	0.1	0.0	0.1	±1.0	P	0.4
800	0.1	0.0	0.1	±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	-0.5	-0.3	-0.2	±1.0	P	0.6
3150	-0.7	-0.5	-0.2	±1.0	P	0.6
4000	-1.1	-0.8	-0.3	±1.0	P	0.6
5000	-1.5	-1.3	-0.2	±1.5	P	0.6
6300	-2.1	-2.0	-0.1	+1.5 ~ -2.0	P	0.6
8000	-3.0	-3.0	0.0	+1.5 ~ -2.5	P	0.6
10000	-4.2	-4.4	0.2	+2.0 ~ -3.0	P	0.6
12500	-6.2	-6.2	0.0	+2.0 ~ -5.0	P	1.0
16000	-10.4	-8.5	-1.9	+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.): 2HB20001172-0003

### 6 自生噪声 (Autogenous noise)

计权 (Weighting)	实测值 (Actual) (dB)
A	24.0

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# Calibration Certificate of Sound Level Meter



**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: 2HB20001172-0004  
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.	00976204	
管理号: Asset No.	AAST-SLM-11	
接收日期: Rec. Date	2020-07-15	校准日期: Cal. Date
签发日期: App. Date	2020-07-20	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: 广州天河区东莞庄路110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  
H.Q. Addr: No.110.Dongguzhuang Road,Tianhe District,Guangzhou  
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.): 2HB20001172-0004

## 说明 DIRECTIONS

1. 本机构质量管理体系符合ISO/IEC 17025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 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。(Please see the attachment of certificate No. L13344 at CNAS website for details, beyond which is not accredited).

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)
数字多用表	4GC19040017-0001/2020-11-03/赛宝	DCV: ±0.0035%; ACV: ±0.06%; DCI: ±0.05%; ACI: ±0.1%; R: ±0.01%; f: ±0.01%
步进衰减器	4GC20000158-0012/2021-04-29/赛宝	±3dB
标准传声器	GFJGJL1001200310164/2021-02-26/航空304所	U=(0.05-0.12)dB (k=2)
声校准器	4GC19040146-0209/2020-12-29/赛宝	1级
正弦信号发生器	4GC19040057-0001/2020-11-05/赛宝	f: ±1mHz; 失真度: <-70dB
PULSE分析系统	4GC20000009-0001/2021-01-08/赛宝	频率: U <sub>ref</sub> =0.001%, k=2; 电压: U <sub>ref</sub> =0.04%, k=2
前置放大器	GFJGJL1001200310165/2021-02-26/航空304所	U=0.3dB (k=2)

4. 校准地点(The calibration place):  
广州市天河区东莞庄路110号401楼振动声学室

5. 环境条件(Environmental conditions):  
温度(Temperature): 24°C 相对湿度(Relative Humidity): 60%

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”。本证书报告的判定规则和结论仅供参考, 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". The judgment rules and 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建议校准周期。  
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 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.): 2HB20001172-0004

### 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	-50.6	-50.5	-0.1	±2.0	P	0.5
25	-44.9	-44.7	-0.2	+2.0 ~ -1.5	P	0.5
31.5	-39.8	-39.4	-0.4	±1.5	P	0.5
40	-34.6	-34.6	0.0	±1.0	P	0.5
50	-30.4	-30.2	-0.2	±1.0	P	0.5
63	-26.3	-26.2	-0.1	±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	-6.7	-6.6	-0.1	±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	-7.9	-6.6	-1.3	+2.5 ~ -16.0	P	1.0
20000	-14.2	-9.3	-4.9	+3.0 ~ -∞	P	1.0

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## Calibration Certificate of Sound Level Meter



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

### 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 (k=2) (dB)
20	-6.4	-6.2	-0.2	±2.0	P	0.5
25	-4.5	-4.4	-0.1	+2.0 ~ -1.5	P	0.5
31.5	-3.1	-3.0	-0.1	±1.5	P	0.5
40	-2.1	-2.0	-0.1	±1.0	P	0.5
50	-1.3	-1.3	0.0	±1.0	P	0.5
63	-0.9	-0.8	-0.1	±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	-0.1	-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	0.0	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	-0.1	-0.2	0.1	±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

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### 6 自生噪声 (Autogenous noise)

计权 (Weighting)	实测值 (Actual) (dB)
A	23.8

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# 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.

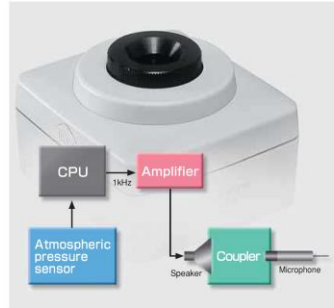


Usage example (NL series)

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: 2HB20001561-0002

Certificate No.



中国认可  
国际互认  
校准  
CALIBRATION  
CNAS L13344

委托单位: Castco Testing Centre Limited  
Client  
仪器名称: Sound Level Calibrator  
Description  
型号规格: NC-74  
Model/Type  
制造商: RION  
Manufacturer  
机身号: 34678556  
Serial No.  
管理号: AAST-SLC-06  
Asset No.  
接收日期: 2020-09-08 校准日期: 2020-09-12  
Rec. Date Cal. Date  
签发日期: 2020-09-12 建议校准周期: 12个月(12 months)  
App. Date Reference Cal. Period  
结论: 所校准项目合格(Passed at Calibration Items)  
Conclusion

**CEPREI**

校准: 陈卓辉  
Calibrated by  
签发: 郑木力  
Approved by

核验: 钟灏  
Inspected by  
印章:  
Stamp

赛宝计量检测中心  
广州总部地址: 广州天河区东莞庄路110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  
H.Q. Addr: No.110,Dongguanzhuang Road,Tianhe District,Guangzhou  
Service Tel: 020-87237633 Fax: 020-87236189  
Complain 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.): 2HB20001561-0002

## 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):  
▪ JG 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~20 kHz).

\* 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。(Please see the attachment of certificate No. L13344 at CNAS website for details, beyond which is not accredited).

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	LSvm2020-02491/2021-04-26/中国计量院	频率: $U_{rel}=0.001\%$ , $k=2$ ;电压: $U_{rel}=0.04\%$ , $k=2$	频率:0.001Hz~51.2kHz, 电压:( $1 \times 10^{-5} \sim 30$ )V
标准传声器 304所	GFJGIL1001200310164/2021-02-26/航空	$U=(0.05 \sim 0.12)$ dB ( $k=2$ )	20Hz~20kHz
前置放大器 304所	GFJGIL1001200310165/2021-02-26/航空	$U=0.3$ dB ( $k=2$ )	(10~20000) Hz

4. 校准地点(The calibration place):  
广州市天河区东莞庄路110号401楼振动声学室

5. 环境条件(Environmental conditions):  
温度(Temperature): 24°C 相对湿度(Relative Humidity): 60%

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"。本证书报告的判定规则和结论仅供参考, 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  $\leq$ High Limit", "F" and "Fail" stand for "the measured value < Low Limit or the measured value > High Limit", "N/A" stands for "Not Applicable". The judgment rules and 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建议校准周期。  
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.): 2HB20001561-0002

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)	$U_{rel}$ (dB)
94	94.05	0.05	$\leq 0.40$	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	1003.7	0.37	$\leq 1.00$	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	0.96	$\leq 3.00$	P	5.0

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数据页(Data sheet) ID: U013393

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# 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: 2HB20001172-0006  
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	2020-07-15	校准日期: Cal. Date	2020-07-20
签发日期: App. Date	2020-07-21	建议校准周期: Reference Cal. Period	12个月(12 Months)
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: 广州天河区东圃庄路110号  
客服电话: 020-87237633 传真: 020-87236189  
投诉电话: 020-87236896  
邮箱: cal@ceprei.com  
网址: www.ceprei-cal.com

CEPREI Calibration and Testing Centre  
H.Q. Addr: No.110.Dongguanzhuang Road,Tianhe District,Guangzhou  
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.): 2HB20001172-0006

## 说明 DIRECTIONS

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This laboratory quality management system meets the ISO/IEC 17025 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~20 kHz).  
• 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。(Please see the attachment of certificate No. L13344 at CNAS website for details, beyond which is not accredited).
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名称 (Description)	证书号/有效期/溯源单位 (Certificate No./Due Date/Traceability to)	技术指标 (Specification)
标准传声器 304所	GFJGJL1001200310164/2021-02-26/航空	$U=0.05-0.12$ dB ( $k=2$ )
前置放大器 304所	GFJGJL1001200310165/2021-02-26/航空	$U=0.3$ dB ( $k=2$ )
PULSE分析系统	4GC20000024-0064/2021-02-12/赛宝	频率: $U_{rel}=0.001\%$ , $k=2$ ;电压: $U_{rel}=0.04\%$ , $k=2$
4. 校准地点(The calibration place):  
广州市天河区东圃庄路110号401楼振动声学室
5. 环境条件(Environmental conditions):  
温度(Temperature): 24°C 相对湿度(Relative Humidity): 60%
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。  
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"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". The judgment rules and 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.
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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.): 2HB20001172-0006

## 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	94.38	0.38	≤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	1002.0	0.20	≤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	2.48	≤3.00	P	5.0

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CEPREI

数据页(Data sheet) ID: U013393

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# 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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Airflow Instruments, TSI Instruments Ltd.  
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

P/N 2980548 Rev D (A4) ©2014 TSI Incorporated

### 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/C (0.05°F/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



深圳市东华计量检测技术有限公司  
Shenzhen Donghua Metrology & Testing Technology Co., Ltd.



AAST-FLOW-03, Cal Cert 2021/2/26

## 校准证书 CALIBRATION CERTIFICATE

证书编号:  
Certificate No. **DH21AA002160001**

委托方名称:  
Client name **Castco Testing Centre Limited**

委托方地址:  
Add. of Client **33, On Kui Street, Fanling, N.T.**

计量器具名称:  
Name of Instrument **风速计**

型号/规格:  
Type/Specification **TA440**

制造单位:  
Manufacturer **AIRFLOW**

器具编号:  
Serial No. **AAST-FLOW-03/TA4401706003**

接收日期:  
Date of Receipt **2021 年 02 月 23 日**

校准日期:  
Date of calibration **2021 年 02 月 26 日**

批准人: 蒋荣飞 蒋荣飞 签发日期: 2021 年 02 月 26 日  
Approved by \_\_\_\_\_ Date of issue Year / Month / Day

核验员: 张吉庆 张吉庆  
Checked by \_\_\_\_\_

校准员: 蒋新建 蒋新建  
Calibrated by \_\_\_\_\_

该二维码非公众号



(证书专用章)  
Stamp

扫描证书信息(真伪)

计量校准机构备案号: 粤校备2017B010

Register No: 粤校备2017B010

地址: 深圳市龙华区大浪街道同胜社区清华科技园厂房A1层

Add: 1st Floor, Building A1, Puhua Science and Technology Park, Tongsheng Community, Dalang Street, Longhua District, Shenzhen, Guangdong, China

电话: 0755-28161768/28162768/28166778

Tel: 0755-28161768/28162768/28166778

传真: 0755-21004376 邮编: 518109

Fax: 0755-21004376 / Zip Code: 518109

网址: www.szdhj.com 电子邮箱: szdhj@163.com

http://www.szdhj.com E-mail: szdhj@163.com

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深圳市东华计量检测技术有限公司  
Shenzhen Donghua Metrology & Testing Technology Co., Ltd.

证书编号: **DH21AA002160001**  
Certificate No.

### 证书说明 Certificate Statement

- 本校准证书包含的数据和信息仅对本次被校准的计量器具负责。  
The calibration certificate contains data and information applies only to the calibrated instrument.
- 本公司仅对加盖我司的“证书专用章”的完整证书负责。  
The company only Division I stamped “certificate special seal” is responsible for the full certificate.
- 未经本公司书面授权, 不得部分复印证书。  
The certificate shall not be photocopied without the written authorization of the company.
- 本次校准依据的技术文件:  
Reference Documents for the Calibration:  
JJG (建设) 0001-1992 热球式风速仪计量检定规程  
JJG (建设) 0001-1992 Metrological Verification Regulation of Hot Ball shaped Anemometer

- 5、本次校准所使用的主要计量标准器具:  
Major standards of measurement used in the calibration:

设备名称 Equipment Name	测量范围 Measuring Range	不确定度/准确度等级 /最大允许误差 Uncertainty/Accuracy/Class/ Maximum permissible Error	设备编号 Equipment No.	溯源机构/ 证书编号 Traceability to/ Certificate No.	溯源有效期 Traceability Due Date
补偿式微压计	(-2500~2500) Pa	二等	SM1926	上海市计量测试技术研究院 2018E21-20- 2637951001	2022-07-28
皮托管	(0~30) m/s	-	SM326	中国计量科学研究院 RGV2019-0007	2024-01-20
机械式温湿度计	温度: (-20~80) °C; 湿度: (0~ 100) %RH	MPE: 温度: ±2°C, 湿 度: ±(5~7) %	85926	深圳市计量质量检测研 究院 205605616	2021-05-10
空盒气压表	(800~1060) hPa	U=0.6hPa, k=2	15033115	深圳市计量质量检测研 究院 204373348	2021-08-17
标准水银温度计	(0~50) °C	U=0.03°C, k=2	2-204	深圳市计量质量检测研 究院 205502058	2022-03-09

- 6、校准地点: 本公司力学实验室  
Operation Location

- 7、环境条件: 温度 21.7 °C 相对湿度 60% 大气压 1010.0 hPa  
Operation Environment Temperature RH

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## Calibration Certificate of Air Flow Meter



深圳市东华计量检测技术有限公司  
Shenzhen Donghua Metrology & Testing Technology Co., Ltd.

证书编号: DH21AA002160001  
Certificate No.

### 校准结果 Result of Calibration

- 外观及工作正常性检查: 正常
- 校准结果:

标准值 (m/s)	示值 (m/s)	示值误差 (m/s)	不确定度 (k=2) $U_{rel}$
2.50	2.50	0.00	3%
3.00	2.99	-0.01	3%
5.00	4.98	-0.02	3%
10.00	9.98	-0.02	3%
15.00	14.96	-0.04	3%
20.00	19.96	-0.04	3%
25.00	24.95	-0.05	3%

#### 说明 (Explanation):

- 本次测量结果的不确定度 ( $k=2$ )。  
The uncertainty of the measurement result ( $k=2$ ).
- 本次校准结果不确定度的评估和表述依据JJF1059.1的要求。  
The uncertainty of the calibration result is evaluated and expressed according to the requirement of JJF1059.1.
- 根据客户要求 and 所依据技术文件的规定, 建议复校时间间隔不超过12个月。  
According to customers' request and technical documents, the re-check time interval should not exceed 12 months.

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## Calibration Certificate of Air Flow Meter

AAST-FLOW-04, Cal Cert 2021/2/26



深圳市东华计量检测技术有限公司  
Shenzhen Donghua Metrology & Testing Technology Co., Ltd.



## 校准证书 CALIBRATION CERTIFICATE

证书编号: DH21AA002160002  
Certificate No.

委托方名称: Castco Testing Centre Limited  
Client name

委托方地址: 33, On Kui Street, Fanling, N.T.  
Add. of Client

计量器具名称: 风速计  
Name of Instrument

型号/规格: TA440  
Type/Specification

制造单位: AIRFLOW  
Manufacturer

器具编号: AAST-FLOW-04/TA4401739003  
Serial No.

接收日期: 2021 年 02 月 23 日  
Date of Receipt Year Month Day

校准日期: 2021 年 02 月 26 日  
Date of calibration Year Month Day

批准人: 蒋荣飞 蒋荣飞 签发日期: 2021 年 02 月 26 日  
Approved by Date of issue Year Month Day

核验员: 张吉庆 张吉庆  
Checked by

校准员: 蒋新建 蒋新建  
Calibrated by

计量校准机构备案号: 粤校备2017B010  
地址: 深圳市龙华区大浪街道同胜社区浦华科技园厂房 A1层  
电话: 0755-28161768/28162768/28166778  
传真: 0755-21004376 邮编: 518109  
网址: www.szdhl.com 电子邮箱: szdhjl@163.com

Register No: 粤校备2017B010  
Add: 1st Floor, Building A1, Puhua Science and Technology Park, Tongsheng Community, Dalang Street, Longhua District, Shenzhen, Guangdong, China  
Tel: 0755-28161768/28162768/28166778  
Fax: 0755-21004376 Zip Code: 518109  
http://www.szdhl.com E-mail: szdhjl@163.com

扫二维码非公众号



(证书专用章)  
Stamp

扫描证书信息 (真伪)

# Calibration Certificate of Air Flow Meter



**深圳市东华计量检测技术有限公司**  
Shenzhen Donghua Metrology & Testing Technology Co., Ltd.

证书编号: **DH21AA002160002**  
Certificate No.

## 证书说明

Certificate Statement

- 本校准证书包含的数据和信息仅对本次被校准的计量器具负责。  
The calibration certificate contains data and information applies only to the calibrated instrument.
- 本公司仅对加盖我司的“证书专用章”的完整证书负责。  
The company only Division I stamped "certificate special seal" is responsible for the full certificate.
- 未经本公司书面授权, 不得部分复印证书。  
The certificate shall not be photocopied without the written authorization of the company.
- 本次校准依据的技术文件:  
Reference Documents for the Calibration:  
JJG(建设)0001-1992 热球式风速仪计量检定规程  
JJG(建设)0001-1992 Metrological Verification Regulation of Hot Ball shaped Anemometer
- 本次校准所使用的主要计量标准器具:  
Major standards of measurement used in the calibration:

设备名称 Equipment Name	测量范围 Measuring Range	不确定度/准确度等级 /最大允许误差 Uncertainty/Accuracy Class/ Maximum permissible Error	设备编号 Equipment No.	溯源机构/ 证书编号 Traceability to/ Certificate No.	溯源有效期 Traceability Due Date
补偿式微压计	(-2500~2500) Pa	二等	SM1926	上海市计量测试技术研究院 2018E21-20- 2637951001	2022-07-28
皮托管	(0~30) m/s	-	SM326	中国计量科学研究院 RGFv2019-0007	2024-01-20
机械式温湿度计	温度: (-20~80) °C; 湿度: (0~ 100) %RH	MPE: 温度: ±2°C; 湿 度: ±(5~7) %	85926	深圳市计量质量检测研 究院 205605616	2021-05-10
空盒气压表	(800~1060)hPa	$U=0.6\text{hPa}, k=2$	15033115	深圳市计量质量检测研 究院 204373348	2021-08-17
标准水银温度计	(0~50)°C	$U=0.03^\circ\text{C}, k=2$	2-204	深圳市计量质量检测研 究院 205502058	2022-03-09

6、校准地点: 本公司力学实验室  
Operation Location

7、环境条件: 温度 21.7 °C 相对湿度 60% 大气压 1010.0 hPa  
Operation Environment Temperature RH

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**深圳市东华计量检测技术有限公司**  
Shenzhen Donghua Metrology & Testing Technology Co., Ltd.

证书编号: **DH21AA002160002**  
Certificate No.

## 校准结果

Result of Calibration

- 外观及工作正常性检查: 正常
- 校准结果:

标准值 (m/s)	示值 (m/s)	示值误差 (m/s)	不确定度 (k=2) $U_{rel}$
2.50	2.50	0.00	3%
3.00	3.00	0.00	3%
5.00	4.99	-0.01	3%
10.00	9.98	-0.02	3%
15.00	14.96	-0.04	3%
20.00	19.95	-0.05	3%
25.00	24.95	-0.05	3%

说明 (Explanation):

- 本次测量结果的不确定度 ( $k=2$ )。  
The uncertainty of the measurement result ( $k=2$ ).
- 本次校准结果不确定度的评估和表述依据JJF1059.1的要求。  
The uncertainty of the calibration result is evaluated and expressed according to the requirement of JJF1059.1.
- 根据客户要求和所依据技术文件的规定, 建议复校时间间隔不超过12个月。  
According to customers' request and technical documents, the re-check time interval should not exceed 12 months.

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

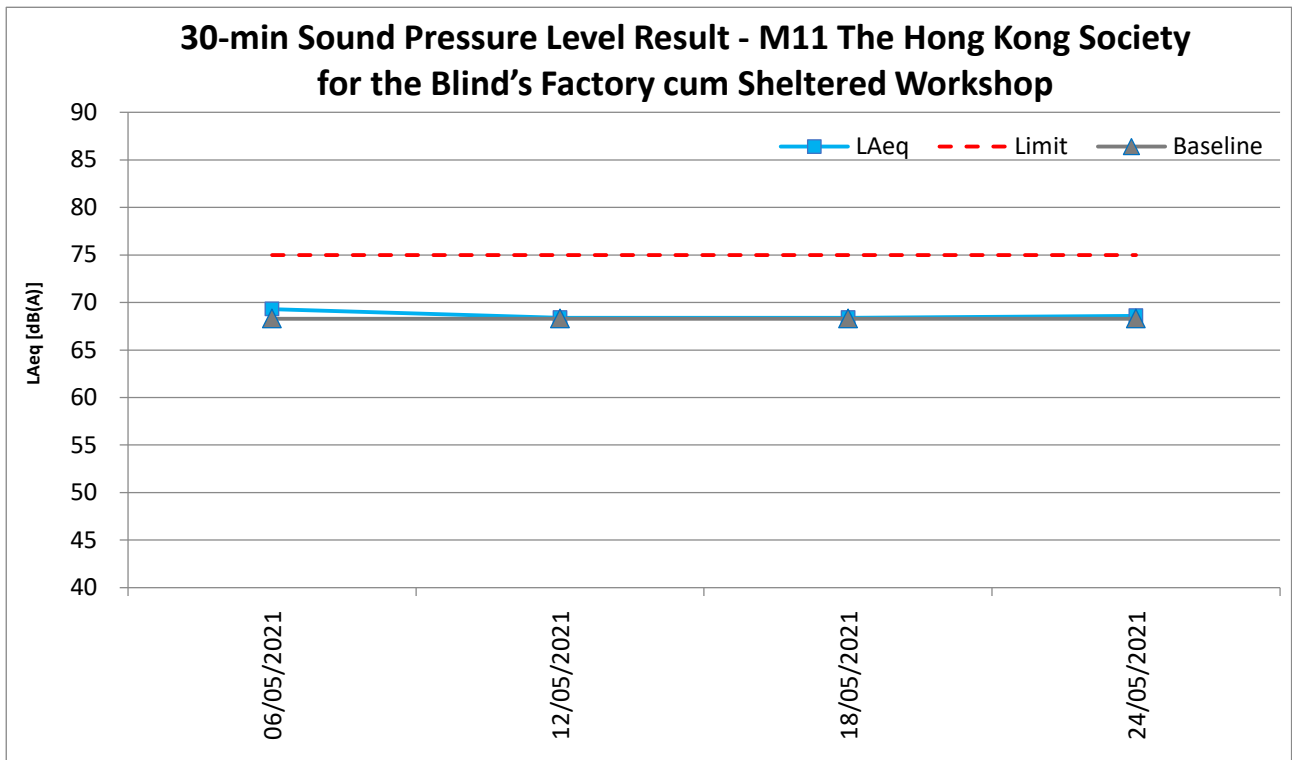
**M11 - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop**

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>	
06/05/2021	28.0	Sunny	10:08	-	10:38	68.3	69.3	71.9	64.2	75
12/05/2021	31.1	Sunny	14:35	-	15:05	68.3	68.4	71.5	61.9	75
18/05/2021	33.8	Sunny	10:40	-	11:10	68.3	68.4	69.0	67.6	75
24/05/2021	29.6	Cloudy	14:13	-	14:43	68.3	68.6	71.2	63.9	75
							Maximum	69.3		
							Minimum	68.4		
							Average	68.7		

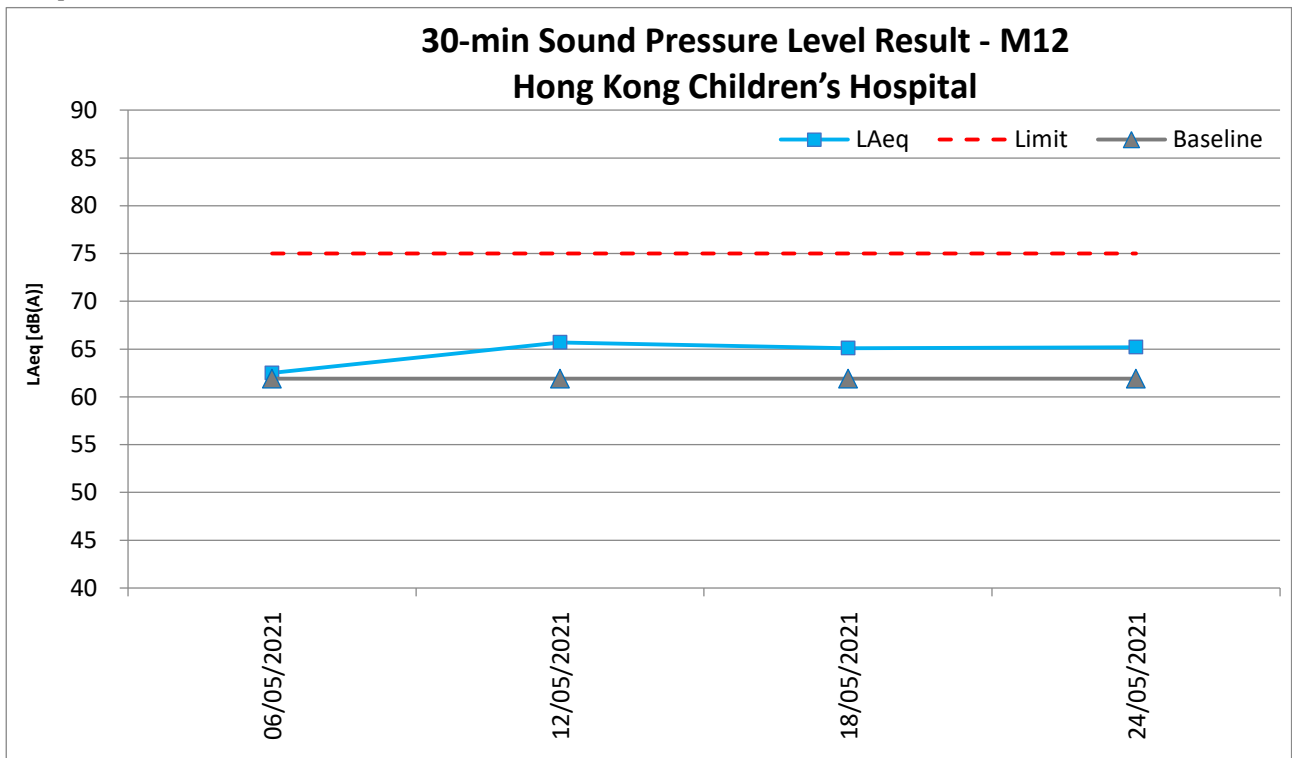
**M12 - Hong Kong Children's Hospital**

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>	
06/05/2021	28.0	Sunny	13:10	-	13:40	61.9	62.5	63.9	60.8	75
12/05/2021	31.1	Sunny	10:40	-	11:10	61.9	65.7	67.8	62.6	75
18/05/2021	33.8	Sunny	14:03	-	14:33	61.9	65.1	67.2	62.3	75
24/05/2021	29.6	Cloudy	11:09	-	11:39	61.9	65.2	67.2	61.7	75
							Maximum	65.7		
							Minimum	62.5		
							Average	64.8		

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



**L<sub>Aeq, 30-min</sub> 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 May 2021

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	9.107	0.177	--	7.885	1.045	--	--	--	--	--	0.091
Feb	5.637	0.127	1.660	2.261	1.589	--	--	--	--	--	0.106
Mar	4.110	--	2.580	--	1.530	0.670	--	--	--	--	0.101
Apr	4.320	--	1.350	--	2.970	--	--	--	--	--	0.120
May	12.813	--	1.225	9.693	1.895	--	--	--	--	--	0.138
Jun	--	--	--	--	--	--	--	--	--	--	--
<b>Sub-total</b>	<b>35.987</b>	<b>0.304</b>	<b>6.815</b>	<b>19.839</b>	<b>9.029</b>	<b>0.670</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>0.556</b>
July	--	--	--	--	--	--	--	--	--	--	--
Aug	--	--	--	--	--	--	--	--	--	--	--
Sep	--	--	--	--	--	--	--	--	--	--	--
Oct	--	--	--	--	--	--	--	--	--	--	--
Nov	--	--	--	--	--	--	--	--	--	--	--
Dec	--	--	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>35.987</b>	<b>0.304</b>	<b>6.815</b>	<b>19.839</b>	<b>9.029</b>	<b>0.670</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>0.556</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>--</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  
(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	^



<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>
		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

<b>Remarks:</b>			
^	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:	06 May 2021	Date:	12 May 2021
Mitigation Measures:	Vehicle washing basin was provided.	Mitigation Measures:	Containers were labelled.
			
Date:	20 May 2021	Date:	20 May 2021
Mitigation Measures:	Watering of the work site with active dust emitting activities by automatic water spray system.	Mitigation Measures:	Quiet PME was used.

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

**Reporting Month: May 2021**

<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	1	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>The water spraying system was not operated in proper time.</li> <li>Stockpile was not covered properly.</li> <li>Haul road was not wetted.</li> <li>Materials transported on trucks were not provided with mechanical covers.</li> </ol>	<p><u>Investigation</u></p> <ol style="list-style-type: none"> <li>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>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>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>Increase the frequency and duration for automatic water spraying system.</li> <li>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>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>	<ul style="list-style-type: none"> <li>Closed-out on 5 Nov 2020</li> <li>No further complaint was received.</li> </ul>

<b>Complaint Log for ED/2018/01</b>				
Complaint Ref. No.	Date of Complaint	Description of Complaint	Investigation / Recommendations / Actions	Close-Out Date / Status
			<u>Action taken</u> 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.	