

# FUGRO TECHNICAL SERVICES LIMITED

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## 62<sup>nd</sup> CONSOLIDATED MONTHLY EM&A REPORT

December 2021

**Client** : Civil Engineering and Development Department, HKSAR

**EP No.** : EP-337/2009 –  
New Distributor Roads Serving the Planned Kai Tak  
Development Area

**Contract No.** : KLN/2016/05 –  
Independent Environmental Checker for  
Contract No. KL/2015/02 Kai Tak Development –  
Stage 5A Infrastructure at Former North Apron Area

**Report No.** : 0087/16/ED/1144

**Prepared by** : Toby Wan

**Reviewed by** : Calvin Leung

**Certified by** :   
Colin Yung  
Independent Environmental Checker  
Fugro Technical Services Limited

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**EXECUTIVE SUMMARY**

- i. This is the 62<sup>nd</sup> Consolidated Monthly EM&A Report which summaries the EM&A works undertaken by respective contract under EP-337/2009 within the period between 1 December and 31 December 2021.
- ii. The construction activities undertaken in the reporting month are summarized as follow:

**Contract No. KL/2014/01:**

- Architectural features works at landscaped deck and ground floor open space
- Defect work of pedestrian streets
- E&M works
- Laying of paving blocks for footpath
- Planting works along footpath and at deck level, and
- TTA implementation, minor works at Shing Fung Road and Wang Chiu Road / Kai Cheung Road

**Contract No. KL/2015/02:**

- Carry out backfilling works around Staircase ST1 at SKLR Playground
- Erect scaffolding and construct the top slab of lift shaft at SKLR playground
- Construct pillar box for electrical supply of SW6
- Excavate with ELS installation at PERE TTA Stage 4
- Remedial works for the defects identified by maintenance parties, e.g. DSD, HyD
- Landscaping works at Road L7 and Road D1
- Outstanding works for irrigation system at Road L7 and D1
- Construction of additional street furniture at Road D1 and L7
- Road marking at Road D1 and L7

**Contract No. ED/2018/01:**

- North Approach Ramp – Construction of wall, roof slab, utilities trough
- Bridge D3 – Construction of Bridge Deck and abutments
- North Depressed Road – Construction of wall & top slab
- Underpass – Construction of walls and roof slab
- South Approach Ramp – Construction of Permanent Structure
- District Cooling System seawater intake box culvert – Installation of precast units and backfilling works, reinstatement of the seawall and backfilling works
- Lift 3 –Construction of linking platform
- Lift 4 –Construction of Wall and Roof Slab / Installation of Steelworks and Glass Panel
- South Depressed Road –Installation of ELS system / construction of permanent works
- Rising Main and Water Pipe – Laying of sewage
- Landscaped Deck –Construction of pile caps and installation of columns
- Transformer Room –Installation of ELS system and construction of permanent structure
- Road D3 Junction –Road works
- Lift 1 & 2 -Installation of ELS system

**Contract No. ED/2018/05:**

- Underground utility diversion works and pillar box relocation works at Sa Po Road
- Bored pile works for landscape elevated walkway LW-02
- Sheetpile installation at launching shaft for subway SB-01
- Drainage works for Pedestrian Street No. 1, No. 2 & No. 3
- Construction of Crowd Dispersal Route
- Twin rising mains diversion works

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

- iii. No Action / Limit Level exceedance was recorded for 24-hr TSP monitoring in the reporting month.
- iv. No Action / Limit Level exceedance was recorded for 1-hr TSP monitoring in the reporting month.
- v. No Action / Limit Level exceedance was recorded for noise monitoring in the reporting month.

### **Complaint, Notification of Summons and Successful Prosecution**

- vi. No complaint, notification of summons or prosecution was received for Contract No. KL/2014/01, Contract No. KL/2015/02, and Contract No. ED/2018/05 in this reporting month.
- vii. One complaint was received for Contract No. ED/2018/01 in this reporting month. The complaint was received on 10 December 2021 and close-out in 5 January 2022.

### **Reporting Changes**

- viii. There was no reporting change in the reporting month.



**Future Key Issues**

ix. The potential environmental impacts for the coming month and the control measures are shown in **Table I**:

Table I Summary of Key Issues for the Coming Month and Control Measures

Major Impact Prediction	Control Measures
<b>Contract No. KL/2014/01:</b>	
Air quality impact (dust)	<ul style="list-style-type: none"> <li>• Frequent watering of haul road and unpaved/exposed areas;</li> <li>• Frequent watering or covering stockpiles with tarpaulin or similar means; and</li> <li>• Watering of any earth moving activities.</li> </ul>
Water quality impact (surface run-off)	<ul style="list-style-type: none"> <li>• Diversion of the collected effluent to de-silting facilities for treatment prior to discharge to public storm water drains;</li> <li>• Provision of adequate de-silting facilities for treating surface run-off and other collected effluents prior to discharge;</li> <li>• Provision of perimeter protection such as sealing of hoarding footings to avoid run-off from entering the existing storm water drainage system via public road; and</li> <li>• Provision of measures to prevent discharge into the stream.</li> </ul>
Noise Impact	<ul style="list-style-type: none"> <li>• Scheduling of noisy construction activities if necessary to avoid persistent noisy operation;</li> <li>• Controlling the number of plants use on site;</li> <li>• Regular maintenance of machines; and</li> <li>• Use of acoustic barriers if necessary.</li> </ul>
Waste/ Chemical Management	<ul style="list-style-type: none"> <li>• Maintenance involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.</li> <li>• Chemical wastes should be hold by suitable containers with clear label and stored at a safe location.</li> </ul>
<b>Contract No. KL/2015/02:</b>	
Air quality impact (dust)	<ul style="list-style-type: none"> <li>• Frequent watering of haul road and unpaved/exposed areas;</li> <li>• Frequent watering or covering stockpiles with tarpaulin or similar means; and</li> <li>• Watering of any earth moving activities.</li> </ul>
Water quality impact (surface run-off)	<ul style="list-style-type: none"> <li>• Diversion of the collected effluent to de-silting facilities for treatment prior to discharge to public storm water drains;</li> <li>• Provision of adequate de-silting facilities for treating surface run-off and other collected effluents prior to discharge;</li> <li>• Provision of perimeter protection such as sealing of hoarding footings to avoid run-off from entering the existing storm water drainage system via public road; and</li> <li>• Provision of measures to prevent discharge into the stream.</li> </ul>
Noise Impact	<ul style="list-style-type: none"> <li>• Scheduling of noisy construction activities if necessary to avoid persistent noisy operation;</li> <li>• Controlling the number of plants use on site;</li> <li>• Regular maintenance of machines; and</li> <li>• Use of acoustic barriers if necessary.</li> </ul>
<b>Contract No. ED/2018/01:</b>	
Air Quality, Construction Noise, Water Quality, Chemical and	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with the active dust emitting activities,</li> <li>• Limitation of the speed for vehicles on unpaved site roads,</li> <li>• Properly cover the stockpiles,</li> <li>• Good maintenance to the plant and equipment,</li> <li>• Use of quieter plant and Quality Powered Mechanical Equipment (QPME),</li> </ul>

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Major Impact Prediction	Control Measures
Waste Management, Landscape and Visual	<ul style="list-style-type: none"> <li>• Provide movable noise barriers,</li> <li>• Appropriate desilting/ sedimentation devices provided on site for treatment before discharge,</li> <li>• Well maintain the drainage system to prevent the spillage of wastewater during heavy rainfall,</li> <li>• Onsite waste sorting and implementation of trip ticket system,</li> <li>• Good management and control on construction waste reduction,</li> <li>• Erection of decorative screen hoarding,</li> <li>• Strictly following the Environmental Permits and Licenses, and</li> <li>• Provide sufficient mitigation measures as recommended in Approved EIA Reports.</li> </ul>
<b>Contract No. ED/2018/05:</b>	
Air Quality, Construction Noise, Water Quality, Chemical and Waste Management, Landscape and Visual	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with the active dust emitting activities,</li> <li>• Limitation of the speed for vehicles on unpaved site roads,</li> <li>• Properly cover the stockpiles,</li> <li>• Good maintenance to the plant and equipment,</li> <li>• Use of quieter plant and Quality Powered Mechanical Equipment (QPME),</li> <li>• Provide movable noise barriers,</li> <li>• Appropriate desilting/ sedimentation devices provided on site for treatment before discharge,</li> <li>• Well maintain the drainage system to prevent the spillage of wastewater during heavy rainfall,</li> <li>• Onsite waste sorting and implementation of trip ticket system,</li> <li>• Good management and control on construction waste reduction,</li> <li>• Erection of decorative screen hoarding,</li> <li>• Strictly following the Environmental Permits and Licenses, and</li> <li>• Provide sufficient mitigation measures as recommended in Approved EIA Reports.</li> </ul>

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## 1. INTRODUCTION

### 1.1 Background

- 1.1.1 The Kai Tak Development 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.
- 1.1.2 A study of environmental impact assessment (EIA) was undertaken to consider the key issues of air quality, noise, water quality, waste, land contamination, cultural heritage and landscape and visual impact, and identify possible mitigation measures associated with the works. EIA Report (Register No. AEIAR-130/2009) was approved by the Environmental Protection Department (EPD) on 4 March 2009.
- 1.1.3 The EP-337/2009 was issued on 23 April 2009 for the new distributor roads serving the planned Kai Tak Development to the following scale and slope:
- Road D1 – a dual 2-lane carriageway of approximately 1.3 km long.
  - Road D2 – a dual 3-lane carriageway of approximately 1.1 km long.
  - Road D3 – a dual 2-lane carriageway of approximately 2.3 km long.
  - Road D4 – a dual 2-lane carriageway of approximately 0.9 km long.
- 1.1.4 The Civil Engineering and Development Department HKSAR has appointed Fugro Technical Services Limited (FTS) to undertake the role of Independent Environmental Checker (IEC) for the Contract No. KL/2015/02.
- 1.1.5 This is the 62<sup>nd</sup> Consolidated Monthly EM&A Report which summaries the EM&A works undertaken by respective contract under EP-337/2009 within the period between 1 December and 31 December 2021.

### 1.2 Summary of relevant Contract Information of Key Personnel

Party	Position	Name	Telephone	Fax
<b>Contract No. KL/2014/01:</b>				
Project Proponent (CEDD)	Senior Engineer	Mr. Keith Chu	3579 2450	3579 4516
	Engineer	Ms. Adonia Yung	3579 2124	
Engineer's Representative (AECOM)	CRE	Mr. Clive Cheng	3746 1801	2798 0783
IEC (KSMC)	IEC	Dr. Douglas Wong	2618 2166	2120 7752
ET (Cinotech)	ET Leader	Mr. K.S Lee	2151 2091	3107 1388
	Audit Team Leader	Ms. Betty Choi	2151 2072	
Main Contractor (CCJV)	EO	Mr. Jack Lai	2960 1398	2960 1399
<b>Contract No. KL/2015/02:</b>				
Project Proponent (CEDD)	Senior Engineer	Mr. Ricky Chan	2116 3753	2116 0714
Engineer's Representative (AECOM)	SRE	Mr. Vincent Lee	2798 0771	2210 6110
IEC (FTS)	IEC	Mr. Colin Yung	3565 4114	2450 8032
ET (Cinotech)	ET Leader	Mr. K.S Lee	2151 2091	3107 1388
	Audit Team Leader	Ms. Betty Choy	2151 2072	
Main Contractor	Site Agent	Mr. W. M. Wong	6386 3535	2398 8301



Party	Position	Name	Telephone	Fax
(PWHJV)				
<b>Contract No. ED/2018/01:</b>				
Project Proponent (CEDD)	Senior Engineer	Mr. Alex Wong	3579 2452	2739 0076
	Engineer	Ms. Chan Ka Yan	3579 2458	2739 0076
Engineer's Representative (AECOM)	CRE	Mr. Clive Cheng	3911 4201	3911 4288
IEC (Ramboll)	IEC	Mr. Y H Hui	3465 2850	3465 2899
ET (Ka Shing)	ET Leader	Mr. Chan Pang	6082 2973	2120 7752
Main Contractor (Penta-Ocean)	EO	Mr. Lulu Mar	6845 0626	3465 8898
<b>Contract No. ED/2018/05:</b>				
Project Proponent (CEDD)	Senior Engineer	Mr. George Ng	3842 7107	2739 0076
	Engineer	Mr. Albert Tse	3842 7137	2739 0076
	Engineer	Mr. Perry Lo	3842 7143	2739 0076
Engineer's Representative (AECOM)	CRE	Mr. Leung Wai Kit	2412 3410	2798 0783
IEC (Acuity)	IEC	Mr. Kevin Li	2698 6833	2698 9383
ET (Ka Shing)	ET Leader	Mr. Chan Pang	2618 2166	2120 7752
Main Contractor (BK- STEC)	EO	Mr. Raymond Lam	9713 6817	3850 8508

**1.3 Summary of Construction Programme and Activities**

1.3.1 The construction programme of each Contract is summarized in the appendices of the corresponding Monthly EM&A report.

1.3.2 The major construction activities undertaken in the reporting month are summarized as follow:

**Contract No. KL/2014/01:**

- Architectural features works at landscaped deck and ground floor open space
- Defect work of pedestrian streets
- E&M works
- Laying of paving blocks for footpath
- Planting works along footpath and at deck level, and
- TTA implementation, minor works at Shing Fung Road and Wang Chiu Road / Kai Cheung Road

**Contract No. KL/2015/02:**

- Carry out backfilling works around Staircase ST1 at SKLR Playground
- Erect scaffolding and construct the top slab of lift shaft at SKLR playground
- Construct pillar box for electrical supply of SW6
- Excavate with ELS installation at PERE TTA Stage 4
- Remedial works for the defects identified by maintenance parties, e.g. DSD, HyD
- Landscaping works at Road L7 and Road D1
- Outstanding works for irrigation system at Road L7 and D1
- Construction of additional street furniture at Road D1 and L7
- Road marking at Road D1 and L7

**Contract No. ED/2018/01:**

- North Approach Ramp – Construction of wall, roof slab, utilities trough

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- Bridge D3 – Construction of Bridge Deck and abutments
- North Depressed Road – Construction of wall & top slab
- Underpass – Construction of walls and roof slab
- South Approach Ramp – Construction of Permanent Structure
- District Cooling System seawater intake box culvert – Installation of precast units and backfilling works, reinstatement of the seawall and backfilling works
- Lift 3 –Construction of linking platform
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- South Depressed Road –Installation of ELS system / construction of permanent works
- Rising Main and Water Pipe – Laying of sewage
- Landscaped Deck –Construction of pile caps and installation of columns
- Transformer Room –Installation of ELS system and construction of permanent structure
- Road D3 Junction –Road works
- Lift 1 &2 -Installation of ELS system

### **Contract No. ED/2018/05:**

- Underground utility diversion works and pillar box relocation works at Sa Po Road
- Bored pile works for landscape elevated walkway LW-02
- Sheetpile installation at launching shaft for subway SB-01
- Drainage works for Pedestrian Street No. 1, No. 2 & No. 3
- Construction of Crowd Dispersal Route
- Twin rising mains diversion works



**1.4 Summary of Inter-relationship with the environmental protection/ mitigation measures with the construction programme**

1.4.1 The summary of inter-relationship with environmental protection/mitigation measures are presented as follow:

Major Environmental Impact	Control Measures
<b>Contract No. KL/2014/01:</b>	
Noise, dust impact, water quality and waste generation	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with active dust emitting activities;</li> <li>• Properly cover the stockpiles;</li> <li>• On-site waste sorting and implementation of trip ticket system</li> <li>• Appropriate desilting/sedimentation devices provided on site for treatment before discharge;</li> <li>• Use of quiet plant and well-maintained construction plant;</li> <li>• Well maintain the drainage system to prevent the spillage of wastewater during heavy rainfall;</li> <li>• Provide mitigation measure to temporary use of chemicals;</li> <li>• Provide sufficient mitigation measures as recommended in Approved EIA Report/Lease requirement.</li> </ul>
<b>Contract No. KL/2015/02:</b>	
Noise, dust impact, water quality and waste generation	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with active dust emitting activities;</li> <li>• Properly cover the stockpiles;</li> <li>• On-site waste sorting and implementation of trip ticket system</li> <li>• Appropriate desilting/sedimentation devices provided on site for treatment before discharge;</li> <li>• Use of quiet plant and well-maintained construction plant;</li> <li>• Provide movable noise barrier;</li> <li>• Well maintain the drainage system to prevent the spillage of wastewater during heavy rainfall;</li> <li>• Provide sufficient mitigation measures as recommended in Approved EIA Report/Lease requirement.</li> </ul>
<b>Contract No. ED/2018/01:</b>	
The mitigation measures for environmental impact including Air Quality, Construction Noise, Water Quality, Chemical and Waste Management, Landscape and Visual shall be implemented:	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with the active dust emitting activities,</li> <li>• Limitation of the speed for vehicles on unpaved site roads,</li> <li>• Properly cover the stockpiles,</li> <li>• Good maintenance to the plant and equipment,</li> <li>• Use of quieter plant and Quality Powered Mechanical Equipment (QPME),</li> <li>• Provide movable noise barriers,</li> <li>• Appropriate desilting/ sedimentation devices provided on site for treatment before discharge,</li> <li>• Well maintain the drainage system to prevent the spillage of wastewater during heavy rainfall,</li> <li>• Onsite waste sorting and implementation of trip ticket system,</li> <li>• Good management and control on construction waste reduction,</li> <li>• Erection of decorative screen hoarding,</li> <li>• Strictly following the Environmental Permits and Licenses,</li> </ul>



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Major Environmental Impact	Control Measures
	and <ul style="list-style-type: none"> <li>• Provide sufficient mitigation measures as recommended in Approved EIA Reports.</li> </ul>
<b>Contract No. ED/2018/05:</b>	
The mitigation measures for environmental impact including Air Quality, Construction Noise, Water Quality, Chemical and Waste Management, Landscape and Visual shall be implemented:	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with the active dust emitting activities,</li> <li>• Limitation of the speed for vehicles on unpaved site roads,</li> <li>• Properly cover the stockpiles,</li> <li>• Good maintenance to the plant and equipment,</li> <li>• Use of quieter plant and Quality Powered Mechanical Equipment (QPME),</li> <li>• Provide movable noise barriers,</li> <li>• Appropriate desilting/ sedimentation devices provided on site for treatment before discharge,</li> <li>• Well maintain the drainage system to prevent the spillage of wastewater during heavy rainfall,</li> <li>• Onsite waste sorting and implementation of trip ticket system,</li> <li>• Good management and control on construction waste reduction,</li> <li>• Erection of decorative screen hoarding,</li> <li>• Strictly following the Environmental Permits and Licenses, and</li> <li>• Provide sufficient mitigation measures as recommended in Approved EIA Reports.</li> </ul>

## 1.5 Summary Status of Environmental Licences, Notifications and Permits

1.5.1 Detailed relevant environmental licenses, permits and/or notifications on environmental protection for this EP are presented in the appendices of the corresponding Monthly EM&A report.



**2. ENVIRONMENTAL MONITORING AND AUDIT**

**2.1 Results and Observations**

Air Quality

- 2.1.1 The schedule of air quality monitoring in reporting month is provided in the appendices of the corresponding Monthly EM&A report.
- 2.1.2 The weather conditions during the monitoring are provided in the appendices of the corresponding Monthly EM&A report.
- 2.1.3 The monitoring data of 24-hr TSP and 1 hour TSP are summarized in **Table 2.1**. Detailed monitoring data are presented in the appendices of the corresponding Monthly EM&A report.

**Table 2.1 Summary of 24-hr and 1 hour TSP Monitoring Results**

Parameter	Monitoring Station	Average (µg/m <sup>3</sup> )	Range (µg/ m <sup>3</sup> )	Action Level (µg/ m <sup>3</sup> )	Limit Level (µg/ m <sup>3</sup> )
<b>Contract No. KL/2014/01:</b>					
N.A (No air quality monitoring is required for the Project)					
<b>Contract No. KL/2015/02:</b>					
1-hr TSP	AM2	39.1	19.0 – 66.0	346	500
24-hr TSP	AM2(A)	84.6	44.1 – 125.6	157	260
<b>Contract No. ED/2018/01:</b>					
24-hr TSP	AM3	75	26 – 93	182	260
	AM4(A)	70	22 – 90	187	
	AM7	80	24 – 109	181	
1-hr TSP	AM3	56	21 – 82	297	500
	AM4(A)	58	26 – 73	326	
	AM7	65	23 – 96	315	
<b>Contract No. ED/2018/05:</b>					
24-hr TSP	AM2(A)	72	25 – 104	175	260
	AM3	75	26 – 93	172	
1-hr TSP	AM2(A)	54	20 – 88	302	500
	AM3	56	21 – 82	301	

- 2.1.4 No Action / Limit Level exceedance was recorded for 24-hr TSP monitoring in the reporting month.
- 2.1.5 No Action / Limit Level exceedance was recorded for 1-hr TSP monitoring in the reporting month.
- 2.1.6 The monitoring data of 24-hr TSP was compared with the EIA predictions are presented in the appendices of the corresponding Monthly EM&A report.
- 2.1.7 The Event and Action Plan for air quality is given in in the appendices of the corresponding Monthly EM&A report.



Noise

- 2.1.8 The schedule of noise monitoring in reporting month is provided in in the appendices of the corresponding Monthly EM&A report.
- 2.1.9 The noise monitoring data are summarized in **Table 2.2**. Detailed monitoring data are presented in the appendices of the corresponding Monthly EM&A report.

**Table 2.2 Summary of Noise Impact Monitoring Results**

Monitoring Stations	Construction Noise Level Leq (30min) dB(A) (Range)	Action Level	Limit Level dB (A)	
<b>Contract No. KL/2014/01:</b>				
N.A (No Construction noise monitoring is required for the Project.)		When one documented complaint is received.	NA	
<b>Contract No. KL/2015/02:</b>				
M3(A)	67.6 – 74.5 #		75	
M4	72.1 – 74.1 #		70*	
M5(C)	73.1 – 74.8 #		75	
<b>Contract No. ED/2018/01:</b>				
M11	67.1 – 68.1		75	
M12	63.8 – 65.9		75	
<b>Contract No. ED/2018/05:</b>				
M4(A)	69.4 – 71.0		75	
M5(A)	72.2 – 74.5		75	

(\* ) Noise Limit Level is 65 dB(A) during school examination periods.

(#) Measured noise level ≤ background / baseline noise level, detailed data refer to the corresponding Monthly EM&A report.

- 2.1.10 The noise monitoring data was compared with the EIA predictions are presented in the appendices of the corresponding Monthly EM&A report.
- 2.1.11 No Action / Limit Level exceedance was recorded for noise monitoring in the reporting month.
- 2.1.12 The Event and Action Plan for noise is given in in the appendices of the corresponding Monthly EM&A report.

Landscape and Visual

- 2.1.13 Site audits were carried out on a weekly basis to monitor and audit the landscape and visual mitigation measures within the site boundaries of this Project. Detailed of observations are presented in the appendices of the corresponding Monthly EM&A report.

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### **3. SITE INSPECTION**

#### **3.1 Site Inspection**

- 3.1.1 Site inspections were carried out weekly to monitor the implementation of proper environmental pollution control and mitigation measures for the Project.
- 3.1.2 Detailed of observation, recommendation of site inspections and summary of the mitigation measures implementation schedule is provided in the appendices of the corresponding Monthly EM&A Report.



**4. ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE**

**4.1 Complaints, Notification of Summons and Prosecution**

4.1.1 The summary of complaints, notification of summons and prosecution in the reporting month are shown as **Table 4.1**.

Table 4.1 Summary of Complaints, Notification of Summons and Prosecution

Event	No. of Event This Month	Remark
<b>Contract No. KL/2014/01:</b>		
Complaint received	0	NA
Notifications of any summons & prosecutions received	0	NA
<b>Contract No. KL/2015/02:</b>		
Complaint received	0	NA
Notifications of any summons & prosecutions received	0	NA
<b>Contract No. ED/2018/01:</b>		
Complaint received	1	<p><b>Date of complaint received:</b> 10 December 2021</p> <p><b>Close-out date:</b> 5 January 2022</p> <p><b>Description of complaint:</b> Complaint of muddy water being discharged into the sea of To Kwa Wan Typhoon Shelter via a DSD outfall near the roundabout of Shing Fung Road.</p>
Notifications of any summons & prosecutions received	0	NA
<b>Contract No. ED/2018/05:</b>		
Complaint received	0	NA
Notifications of any summons & prosecutions received	0	NA

4.1.2 Detailed records are presented in the appendices of the corresponding Monthly EM&A report.

## FUGRO TECHNICAL SERVICES LIMITED

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### **5. IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES**

#### **5.1 Implementation Status**

5.1.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Reports, the EP and the EM&A Manuals. The implementation status of the mitigation measures during the reporting month are presented in the appendices of the corresponding Monthly EM&A report.

#### **5.2 Waste Management**

5.2.1 The amount of wastes generated of this Project during the reporting month is shown in the appendices of the corresponding Monthly EM&A report.



## 6. FUTURE KEY ISSUES

### 6.1 Construction Programme for the Next Two Months

6.1.1 The major site activities undertaken for the coming two months are summarized in follow:

#### **Contract No. KL/2014/01:**

- Architectural features works at landscaped deck and ground floor open space;
- Defect work of pedestrian streets;
- E&M works;
- Laying of paving blocks for footpath;
- Noise barrier modification
- Planting works along footpath and at deck level, and;
- TTA implementation, minor works at Shing Fung Road and Wang Chiu Road / Kai Cheung Road.

#### **Contract No. KL/2015/02:**

- Carry out backfilling works around Staircase ST1 at SKLR Playground
- Install steel staircase cover at SKLR Playground
- Install lift glazing panel at SKLR Playground
- Carry out structural works of subway at PERE TTA Stages 3 & 4
- Preparation works for road-opening of Road D1 and L7
- Additional works as requested by maintenance parties
- Construction of additional street furniture at Road D1 and L7
- Construction of vehicle gates and chain-link fence

#### **Contract No. ED/2018/01:**

- North Approach Ramp – Construction of utilities trough
- Bridge D3 – Construction of Bridge Deck and abutments
- North Depressed Road – Construction of wall & top slab
- Underpass – Construction of walls and roof slab
- South Approach Ramp – Construction of Permanent Structure
- District Cooling System seawater intake box culvert - Installation of precast units and backfilling works, reinstatement of the seawall and backfilling works
- Lift 3 – Construction of linking platform
- Lift 4 – Construction of Wall and Roof Slab / Installation of Steelworks and Glass Panel
- South Depressed Road – Installation of ELS system / construction of permanent works
- Rising Main and Water Pipe – Laying of sewage
- Landscaped Deck – Construction of pile caps and installation of columns
- Transformer Room – Installation of wailing & strut for the cofferdam / Construction of Permanent Structure
- Road D3 Junction – Road works
- Lift 1 & 2- Installation of ELS system

#### **Contract No. ED/2018/05:**

- Advance works for traffic diversion at Sa Po Road
- Bored pile works for landscape elevated walkway
- Pre-drilling work for S14
- Drainage works for Pedestrian Street No. 1, No. 2 & No.3
- Construction of Crowd Dispersal Route
- Rising main construction
- Sheet pile installation for launching shaft of SB-01



6.1.2 The potential environmental impacts arising from the above construction activities and the control measures are shown in **Table 6.1**:

Table 6.1 Summary of Key Issues for the Coming Month and Control Measures

Major Impact Prediction	Control Measures
<b><u>Contract No. KL/2014/01:</u></b>	
Air quality impact (dust)	<ul style="list-style-type: none"> <li>• Frequent watering of haul road and unpaved/exposed areas;</li> <li>• Frequent watering or covering stockpiles with tarpaulin or similar means; and</li> <li>• Watering of any earth moving activities.</li> </ul>
Water quality impact (surface run-off)	<ul style="list-style-type: none"> <li>• Diversion of the collected effluent to de-silting facilities for treatment prior to discharge to public storm water drains;</li> <li>• Provision of adequate de-silting facilities for treating surface run-off and other collected effluents prior to discharge;</li> <li>• Provision of perimeter protection such as sealing of hoarding footings to avoid run-off from entering the existing storm water drainage system via public road; and</li> <li>• Provision of measures to prevent discharge into the stream.</li> </ul>
Noise Impact	<ul style="list-style-type: none"> <li>• Scheduling of noisy construction activities if necessary to avoid persistent noisy operation;</li> <li>• Controlling the number of plants use on site;</li> <li>• Regular maintenance of machines; and</li> <li>• Use of acoustic barriers if necessary.</li> </ul>
Waste/ Chemical Management	<ul style="list-style-type: none"> <li>• Maintenance involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.</li> <li>• Chemical wastes should be hold by suitable containers with clear label and stored at a safe location.</li> </ul>
<b><u>Contract No. KL/2015/02:</u></b>	
Air quality impact (dust)	<ul style="list-style-type: none"> <li>• Frequent watering of haul road and unpaved/exposed areas;</li> <li>• Frequent watering or covering stockpiles with tarpaulin or similar means; and</li> <li>• Watering of any earth moving activities.</li> </ul>
Water quality impact (surface run-off)	<ul style="list-style-type: none"> <li>• Diversion of the collected effluent to de-silting facilities for treatment prior to discharge to public storm water drains;</li> <li>• Provision of adequate de-silting facilities for treating surface run-off and other collected effluents prior to discharge;</li> <li>• Provision of perimeter protection such as sealing of hoarding footings to avoid run-off from entering the existing storm water drainage system via public road; and</li> <li>• Provision of measures to prevent discharge into the stream.</li> </ul>
Noise Impact	<ul style="list-style-type: none"> <li>• Scheduling of noisy construction activities if necessary to avoid persistent noisy operation;</li> <li>• Controlling the number of plants use on site;</li> <li>• Regular maintenance of machines; and</li> <li>• Use of acoustic barriers if necessary.</li> </ul>
<b><u>Contract No. ED/2018/01:</u></b>	
Air Quality, Construction Noise, Water Quality, Chemical and Waste Management, Landscape and	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with the active dust emitting activities,</li> <li>• Limitation of the speed for vehicles on unpaved site roads,</li> <li>• Properly cover the stockpiles,</li> <li>• Good maintenance to the plant and equipment,</li> <li>• Use of quieter plant and Quality Powered Mechanical Equipment (QPME),</li> <li>• Provide movable noise barriers,</li> <li>• Appropriate desilting/ sedimentation devices provided on site for treatment before discharge,</li> </ul>





Major Impact Prediction	Control Measures
Visual	<ul style="list-style-type: none"> <li>• Well maintain the drainage system to prevent the spillage of wastewater during heavy rainfall,</li> <li>• Onsite waste sorting and implementation of trip ticket system,</li> <li>• Good management and control on construction waste reduction,</li> <li>• Erection of decorative screen hoarding,</li> <li>• Strictly following the Environmental Permits and Licenses, and</li> <li>• Provide sufficient mitigation measures as recommended in Approved EIA Reports.</li> </ul>
<b>Contract No. ED/2018/05:</b>	
Air Quality, Construction Noise, Water Quality, Chemical and Waste Management, Landscape and Visual	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with the active dust emitting activities,</li> <li>• Limitation of the speed for vehicles on unpaved site roads,</li> <li>• Properly cover the stockpiles,</li> <li>• Good maintenance to the plant and equipment,</li> <li>• Use of quieter plant and Quality Powered Mechanical Equipment (QPME),</li> <li>• Provide movable noise barriers,</li> <li>• Appropriate desilting/ sedimentation devices provided on site for treatment before discharge,</li> <li>• Well maintain the drainage system to prevent the spillage of wastewater during heavy rainfall,</li> <li>• Onsite waste sorting and implementation of trip ticket system,</li> <li>• Good management and control on construction waste reduction,</li> <li>• Erection of decorative screen hoarding,</li> <li>• Strictly following the Environmental Permits and Licenses, and</li> <li>• Provide sufficient mitigation measures as recommended in Approved EIA Reports.</li> </ul>

**6.2 Monitoring Schedules for the Next Three Months**

6.2.1 The tentative schedules for environmental monitoring in the coming three months are provided in in the appendices of the corresponding Monthly EM&A.



## **7. CONCLUSIONS**

- 7.1.1 No Action / Limit Level exceedance was recorded for 24-hr TSP monitoring in the reporting month.
- 7.1.2 No Action / Limit Level exceedance was recorded for 1-hr TSP monitoring in the reporting month.
- 7.1.3 No Action / Limit Level exceedance was recorded for noise monitoring in the reporting month.
- 7.1.4 No complaint, notification of summons or prosecution was received for Contract No. KL/2014/01, Contract No. KL/2015/02, and Contract No. ED/2018/05 in this reporting month.
- 7.1.5 One complaint was received for Contract No. ED/2018/01 in this reporting month. The complaint was received on 10 December 2021 and close-out in 5 January 2022.
- 7.1.6 The potential environmental impacts arising from the coming two months of major construction activities and the control measures are shown in **Table 6.1**.

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## Appendix A

### Monthly EM&A Report For

Contract No. KL/2014/01

**Kai Tak Development - Stage 2 Infrastructure works for Developments at Southern Part of  
the Former Runway**

# Civil Engineering and Development Department


**EP-337/2009 & EP-445/2013/A**

**Contract No. KL/2014/01**

**Kai Tak Development –  
Stage 2 Infrastructure works for Developments at  
Southern Part of the Former Runway**

**Monthly EM&A Report  
December 2021**

(Version 1.0)

Approved By	 (Environmental Team Leader)
-------------	---

REMARKS:

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

CINOTECH accepts no responsibility for changes made to this report by third parties

## **CINOTECH CONSULTANTS LTD**

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Our ref: 12-01-2022

12-01-2022

By email: [clive.cheng@acem-ktd.com](mailto:clive.cheng@acem-ktd.com) and By hand

Supervising Officer Representative

Aecom Asia Co Ltd.

8/F Grand Central Plaza Tower 2

138 Shatin Rural Committee Road

Sha Tin, N.T. Hong Kong

(Attn: Mr. Cheng Chi Hung)

Dear Mr. Cheng,

**Re: Contract No. KL/2014/01 (Environmental Permit Nos. EP-337/2009 and EP-445/2013/A)**

**Kai Tak Development –Stage 2 Infrastructure Works for Developments at Southern Part of the Former Runway**

**Monthly EM&A report for December 2021 (version 1.0)**

Reference is made to the Environmental Team's submission of the draft Monthly EM&A Report (version 1.0) for December 2021 provided to Independent Environmental Checker (IEC) via email dated on 12-01-2022 for review and comment.

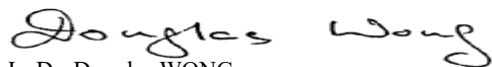
Please be informed that IEC has no adverse comment on the captioned submission. IEC writes to verify the captioned submission in accordance with Specific Condition 2.2 of the Environmental Permit No. 337/2009 and 445/2013/A.

Thank you very much for your attention and please feel free to contact the undersigned should you require further information.

Yours faithfully,

For and on behalf of

Ka Shing Management Consultant Limited



Ir. Dr. Douglas WONG

Independent Environmental Checker

c.c.	CEDD	Mr. Patrick Lee	(By email: <a href="mailto:patricksllee@cedd.gov.hk">patricksllee@cedd.gov.hk</a> )
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	CEC-CCC	Mr. Eric Fong	(By email: <a href="mailto:eric-cs-fong@continental-engineering.com">eric-cs-fong@continental-engineering.com</a> )
	Cinotech	Mr. K.S Lee	(By email: <a href="mailto:ks.lee@cinotech.com.hk">ks.lee@cinotech.com.hk</a> )

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## EXECUTIVE SUMMARY

### Introduction

1. This is the 69<sup>th</sup> Monthly Environmental Monitoring and Audit Report prepared by Cinotech Consultants Ltd. for “Contract No. KL/2014/01 - Kai Tak Development – Stage 2 Infrastructure Works for Developments at the Southern Part of the Former Runway” (Hereafter referred to as “the Project”). This contract work comprises two Schedule 2 designated projects (DP), namely the new distributor road D4 (part) and roads D3A & D4A serving the planned KTD. The DPs are part of the designated projects under Environmental Permits (EP) No.: EP-337/2009 (“New distributor roads serving the planned Kai Tak Development”) and EP-445/2013/A (“Kai Tak Development – Roads D3A & D4A”) respectively. This report documents the findings of EM&A Works conducted in December 2021.
2. With reference to the same principle of EIA report of the Project, air quality monitoring station should be provided at the Air Sensitive Receivers (ASR) within 500 m from the boundary of this Project while construction noise monitoring station should be provided at the Noise Sensitive Receivers (NSR) within 300 m from the boundary of this Project. Since the opening of the Centre of Excellence in Paediatrics (Children’s Hospital) on 18 December 2018, the hospital is considered as the only relevant monitoring location and therefore the monitoring is required.
3. The major site activities undertaken in the reporting month included:
  - Architectural features works at landscaped deck and ground floor open space;
  - Defect work of pedestrian streets;
  - E&M works;
  - Laying of paving blocks for footpath;
  - Planting works along footpath and at deck level, and;
  - TTA implementation, minor works at Shing Fung Road and Wang Chiu Road / Kai Cheung Road.

### Environmental Monitoring Works

4. Environmental monitoring for the Project was performed in accordance with the EM&A Manual and the monitoring results were checked and reviewed. Site Inspections/Audits were conducted once per week. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.
5. Summary of the non-compliance in the reporting month for the Project is tabulated in **Table I**.



**Table I Non-compliance Recorded for the Project in the Reporting Month**

Parameter	No. of Project-related Exceedance		Action Taken
	Action Level	Limit Level	
Noise	0	0	N/A

*Environmental Monitoring for Air Quality and Construction Noise*

6. No monitoring for air quality and construction noise is required. No Action/Limit Level exceedance was recorded.

**Environmental Licenses and Permits**

7. Licenses/Permits granted to the Project include the Environmental Permits (EP) for the Project, EP-337/2009 issued on 23 April 2009 and EP-445/2013 issued on 3 May 2013 (Amended Environmental Permit (No.: EP-445/2013/A) issued on 13 August 2014).
8. Billing Account for Disposal of Construction Waste (A/C No. 7024073)
9. Registration of Chemical Waste Producer (License: 5213-247-C4004-01).
10. Water Discharge License (License: WT00023634-2016).
11. Construction Noise Permits (Permit: GW-RE0442-20, GW-RE0639-20, GW-RE0045-21, GW-RE0717-21 & GW-RE0656-21)

**Key Information in the Reporting Month**

12. Summary of key information in the reporting month is tabulated in **Table II**.

**Table II Summary Table for Key Information in the Reporting Month**

Event	Event Details		Action Taken	Status	Remark
	Number	Nature			
Complaint received	0	---	N/A	N/A	---
Reporting Changes	0	---	N/A	N/A	---
Notifications of any summons & prosecutions received	0	---	N/A	N/A	---

**Future Key Issues**

13. The future key environmental issues in the coming month include:
- Architectural features works at landscaped deck and ground floor open space;
  - Defect work of pedestrian streets;
  - E&M works;
  - Laying of paving blocks for footpath;

- Noise barrier modification
- Planting works along footpath and at deck level, and;
- TTA implementation, minor works at Shing Fung Road and Wang Chiu Road / Kai Cheung Road.

### **Reporting Changes**

14. Since the major parts of Works under Contract no. KL/2014/03 has been completed, the environmental monitoring works of EM&A monitoring station, KTD1a, was then handed over to the ET of Contract no. ED/2018/04 in August, 2020. In order to obtain the environmental impact monitoring data with higher representativeness based on several factors, such as distance between monitoring location and the sensitive receiver, non-project related interference, obstruction to the construction works on site and the power supply problem, the monitoring location KTD1a was relocated to the original location as proposed in the EM&A manual (AEIAR-174/2013), and renamed as KTD1 on 3 August 2020.

## 1. INTRODUCTION

### Background

- 1.1 The Kai Tak Development (KTD) is located in the south-eastern part of Kowloon Peninsula, 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. It covers a land area of about 328 hectares. Stage 2 Infrastructure Works for Developments for Southern Part of the Former Runway is one of the construction stages of KTD. It contains two Schedule 2 DPs including new distributor roads serving the planned KTD and KTD Roads D3A & D4A. The general layout of the Project is shown in **Figure 1**.
- 1.2 One Environmental Permit (EP) No.: EP-337/2009 was issued on 23 April 2009 for new distributor roads serving the planned KTD and one Environmental Permit No.: EP-445/2013 was issued on 3 May 2013 for Kai Tak Development Roads D3A & D4A to Civil Engineering and Development Department (CEDD) as the Permit Holder. Pursuant to Section 13 of the EIAO, the Director of Environmental Protection Department amended the Environmental Permit No.: EP-445/2013 based on the Application No. VEP-449/2014 and the Environmental Permit (No.: EP-445/2013/A) was issued on 13 August 2014.
- 1.3 A study of environmental impact assessment (EIA) was undertaken to consider the key issues of air quality, noise, water quality, waste, land contamination, cultural heritage and landscape and visual impact, and identify possible mitigation measures associated with the works. EIA Reports (Register No. AEIAR-130/2009 and AEIAR-170/2013) were approved by the Environmental Protection Department (EPD) on 4 March 2009 and 3 May 2013 respectively.
- 1.4 Cinotech Consultants Limited (Cinotech) was commissioned by Civil Engineering and Development Department (CEDD) to undertake the role of the Environmental Team (ET) for the Contract No. KL/2014/01 – Stage 2 Infrastructure Works for Developments at the Southern Part of the Former Runway. The construction work under KL/2014/01 comprises the construction of part of the Road D4 under the EP (EP-337/2009) and the construction of Roads D3A & D4A under the EP (EP-445/2013/A).
- 1.5 Cinotech Consultants Limited was commissioned by Civil Engineering and Development Department (CEDD) to undertake the Environmental Monitoring and Audit (EM&A) works for the Project. The construction commencement of this Contract is on 13 April 2016. This is the 69<sup>th</sup> Monthly EM&A report summarizing the EM&A works for the Project in December 2021.
- 1.6 All project information since the commencement of work under EPs including Monthly EM&A Reports is made available to the public via internet access at the website:  
[https://www.epd.gov.hk/eia/english/register/index8/vep4492014\\_content.html](https://www.epd.gov.hk/eia/english/register/index8/vep4492014_content.html)

## Project Organizations

- 1.7 Different parties with different levels of involvement in the project organization include:
- Project Proponent – Civil Engineering and Development Department (CEDD).
  - The Supervising Officer and the Supervising Officer’s Representative (SO) – AECOM Asia Co. Ltd. (AECOM).
  - Environmental Team (ET) – Cinotech Consultants Limited (CCL).
  - Independent Environmental Checker (IEC) – Ka Shing Management Consultant Ltd. (KSMC).
  - Contractor – Continental Engineering Corp. and Chit Cheung Construction Co. Ltd. Joint Venture (CCJV).
- 1.8 The key contacts of the Project are shown in **Table III**.

**Table III Key Project Contacts**

Party	Role	Contact Person	Position	Phone No.	Fax No.
CEDD	Project Proponent	Mr. Keith Chu	Senior Engineer	3579 2450	3579 4516
		Ms. Adonia Yung	Engineer	3579 2124	
AECOM	Supervising Officer	Mr. Clive Cheng	CRE	3746 1801	2798 0783
Cinotech	Environmental Team	Mr. K S Lee	Environmental Team Leader	2151 2091	3107 1388
		Ms. Betty Choi	Audit Team Leader	2151 2072	
KSMC	Independent Environmental Checker	Dr. Douglas Wong	IEC	2618 2166	2120 7752
CCJV	Contractor	Mr. Jack Lai	Environmental Officer	2960 1398	2960 1399

## Construction Activities undertaken during the Reporting Month

- 1.9 The site activities undertaken in the reporting month included:
- Architectural features works at landscaped deck and ground floor open space;
  - Defect work of pedestrian streets;
  - E&M works;
  - Laying of paving blocks for footpath;
  - Planting works along footpath and at deck level, and;
  - TTA implementation, minor works at Shing Fung Road and Wang Chiu Road / Kai Cheung Road.

- 1.10 The construction programme showing the inter-relationship with environmental protection/mitigation measures is presented in **Table IV**.

**Table IV Construction Programme Showing the Inter-Relationship with Environmental Protection/Mitigation Measures**

Construction Works	Major Environmental Impact	Control Measures
As mentioned in Section 1.8	Noise, dust impact, water quality and waste generation	Sufficient watering of the works site with active dust emitting activities; Properly cover the stockpiles; On-site waste sorting and implementation of trip ticket system; Appropriate desilting/sedimentation devices provided on site for treatment before discharge; Use of quiet plant and well-maintained construction plant; Well maintain the drainage system to prevent the spillage of wastewater during heavy rainfall; Provide mitigation measure to temporary use of chemicals; Provide sufficient mitigation measures as recommended in Approved EIA Report/Lease requirement.

### Summary of EM&A Requirements

- 1.11 The EM&A programme requires construction noise monitoring, air quality monitoring, landscape and visual monitoring and environmental site audit. The EM&A requirements for each parameter are described in the following sections, including:
- All monitoring parameters;
  - Action and Limit levels for all environmental parameters;
  - Event Action Plans;
  - Environmental requirements and mitigation measures, as recommended in the EM&A Manual under the EP.
- 1.12 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 5 of this report.

## 2. AIR QUALITY

### Monitoring Requirements

- 2.1 With reference to the same principle of EIA report of the Project, air quality monitoring station should be provided at the Air Sensitive Receivers (ASR) within 500 m from the boundary of this Project. Since the opening of the Centre of Excellence in Paediatrics (Children's Hospital) on 18 December 2018, the hospital is considered as the only relevant monitoring location and therefore the monitoring is required.
- 2.2 As the monitoring works for the hospital is covered by the Contract KL/2014/03 (Kai Tak Development Stage 3 Infrastructure Works for Developments at the Southern Part of the Former Runway) at the monitoring station (KTD1), the corresponding monitoring results for December 2021 should be accessed in the EM&A report for the reporting month. Appendix A shows the established Action and Limit Levels for the environmental monitoring works.

### Observations

- 2.3 No monitoring for air quality is required for this report. No Action/Limit Level exceedance at KTD1 was recorded. The summary of exceedance record in reporting month is shown in **Appendix B**.
- 2.4 Site audits were carried out on a weekly basis to monitor and audit the timely implementation of air quality mitigation measures within the site boundaries of this Project. The summaries of site audits are attached in **Appendix C**.

### 3. NOISE

#### **Monitoring Requirements**

- 3.1 With reference to the same principle of EIA report of the Project, construction noise monitoring station should be provided at the Noise Sensitive Receivers (NSR) within 300 m from the boundary of this Project. Since the opening of the Centre of Excellence in Paediatrics (Children's Hospital) on 18 December 2018, the hospital is considered as the only relevant monitoring location and therefore the monitoring is required.
- 3.2 As the monitoring works for the hospital is covered by the Contract KL/2014/03 (Kai Tak Development Stage 3 Infrastructure Works for Developments at the Southern Part of the Former Runway) at the monitoring station (KTD1), the corresponding monitoring results for December 2021 should be accessed in the EM&A report for the reporting month. Appendix A shows the established Action and Limit Levels for the environmental monitoring works.

#### **Observations**

- 3.3 No monitoring for construction noise is required for this report. No Action/Limit Level exceedance at KTD1 was recorded. The summary of exceedance record in reporting month is shown in **Appendix B**.
- 3.4 Site audits were carried out on a weekly basis to monitor and audit the timely implementation of construction noise mitigation measures within the site boundaries of this Project. The summaries of site audits are attached in **Appendix C**.

#### **4. LANDSCAPE AND VISUAL**

##### **Monitoring Requirements**

- 4.1 According to EM&A Manual of the Kai Tak Development EIA Study, ET shall monitor and audit the contractor's operation during the construction period on a weekly basis, and to report on the contractor's compliance.

##### **Results and Observations**

- 4.2 Site audits were carried out on a weekly basis to monitor and audit the timely implementation of landscape and visual mitigation measures within the site boundaries of this Project. The summaries of site audits are attached in **Appendix C**.
- 4.3 No non-compliance of the landscape and visual impact was recorded in the reporting month.
- 4.4 Should non-compliance of the landscape and visual impact occur, action in accordance with the action plan presented in **Appendix D** shall be performed.



## 5. ENVIRONMENTAL AUDIT

### Site Audits

- 5.1 Site audits were carried out on a weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audits are attached in **Appendix C**.
- 5.2 Site audits were conducted by representatives of the Contractor, Supervising Officer and ET on 2, 9, 16, 22 & 30 December 2021 in the reporting month. IEC joint site inspection was conducted on 22<sup>nd</sup> December 2021. No non-compliance was observed during the site audits.

**Status of Environmental Licensing and Permitting**

5.3 All permits/licenses obtained for the Project are summarized in **Table V**.

**Table V Summary of Environmental Licensing and Permit Status**

Permit No.	Valid Period		Details	Status
	From	To		
<b>Environmental Permit (EP)</b>				
EP-337/2009	23/04/09	N/A	Construction of new distributor roads serving the planned Kai Tak development.	Valid
EP-445/2013/A	13/08/14	N/A	Construction of Kai Tak Development roads D3A and D4A	Valid
<b>Effluent Discharge License</b>				
WT00023634-2016	--	31/03/21	Wastewater from the construction site including effluent treated by screen and sedimentation tank; There are no more need for the license after 31 March 2021 as the project is close to completion and no significant waste water is being generated from site.	Expired on 31 March 2021
<b>Registration of Chemical Waste Producer</b>				
5213-247-C4004-01	--	N/A	Chemical Waste Types: Surplus paint, waste contaminated by paint, diesel, waste contaminated by diesel, spent lubricating oil and waste, soil contaminated by lubricating oil.	Valid
<b>Construction Noise Permit (CNP)</b>				
GW-RE0442-20	14/6/20	13/12/20	Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work other than percussive piling and performing prescribed construction work. Construction Noise Permit for the use of powered mechanical equipment for carrying out construction work other than percussive piling and performing prescribed construction work.	Expired on 13 December 2020
GW-RE0639-20	3/8/20	19/1/21		Expired on 19 February 2021
GW-RE0045-21	20/1/21	19/7/21		Expired on 19 July 2021
GW-RE0656-21	9/7/21	30/9/21		Valid
GW-RE0717-21	30/7/2021	19/1/2022		Valid

### Status of Waste Management

- 5.4 The amount of wastes generated by the major site activities of this Project during the reporting month is shown in **Appendix G**.
- 5.5 In respect of the dump truck cover, the Contractor is reminded to take record photos and inspection to ensure that all dump trucks have fully covered the skip before leaving the site.

### Implementation Status of Environmental Mitigation Measures

- 5.6 During site inspections in the reporting month, no non-conformance was identified. ET weekly site inspections were carried out during the reporting month and the observations and recommendations are summarized in **Table VI**.

**Table VI Observations and Recommendations of Site Inspections**

Parameters	Date	Observations and Recommendations	Follow-up
<i>Water Quality</i>	--	--	--
<i>Air Quality</i>	--	--	--
<i>Noise</i>	--	--	--
<i>Waste/ Chemical Management</i>	--	--	--
<i>Landscape and Visual</i>	--	--	--
<i>Permits/ Licenses</i>	--	--	--

### **Summary of Mitigation Measures Implemented**

- 5.7 An updated summary of the EMIS is provided in **Appendix E**.

### **Implementation Status of Event Action Plans**

- 5.8 The Event Action Plans for noise and landscape and visual are presented in **Appendix D**. No Event Action Plan for air quality is considered necessary.

#### Construction Dust

- 5.9 No Action/Limit Level exceedance was recorded in the reporting month.

#### Construction Noise

- 5.10 No Action/Limit Level exceedance was recorded in the reporting month.

#### Landscape and visual

- 5.11 No non-compliance was recorded in the reporting month.

### **Summary of Complaint, Warning, Notification of any Summons and Successful Prosecution**

- 5.12 The summaries of environmental complaint, warning, summon and notification of successful prosecution for the Project is presented in **Appendix F**.

## 6. FUTURE KEY ISSUES

6.1 Major site activities undertaken for the coming two months include:

- Architectural features works at landscaped deck and ground floor open space;
- Defect work of pedestrian streets;
- E&M works;
- Laying of paving blocks for footpath;
- Noise barrier modification
- Planting works along footpath and at deck level, and;
- TTA implementation, minor works at Shing Fung Road and Wang Chiu Road / Kai Cheung Road.

6.2 Key environmental issues in the coming month include:

- Wastewater and runoff discharge from site;
- Silt, mud and sand along u-channels and sedimentation tanks;
- Review and implementation of temporary drainage system for the surface runoff;
- Noise from operation of the equipment, especially for rock-breaking activities, piling works and machinery on-site;
- Dust generation from stockpiles of dusty materials, exposed site area, excavation works and rock breaking activities;
- Dust generating activity and on haul road;
- Storage of construction materials on site;
- Storage of chemicals/fuel and chemical waste/waste oil on site;
- Accumulation of general and construction waste on site

6.3 The tentative program of major site activities and the impact prediction and control measures for the coming two months, i.e. January and February 2022 are summarized as follows:

<b>Construction Works</b>	<b>Major Impact Prediction</b>	<b>Control Measures</b>
As mentioned in Section 6.1	Air quality impact (dust)	<ul style="list-style-type: none"> <li>a) Frequent watering of haul road and unpaved/exposed areas;</li> <li>b) Frequent watering or covering stockpiles with tarpaulin or similar means; and</li> <li>c) Watering of any earth moving activities.</li> </ul>
	Water quality impact (surface run-off)	<ul style="list-style-type: none"> <li>a) Diversion of the collected effluent to de-silting facilities for treatment prior to discharge to public storm water drains;</li> <li>b) Provision of adequate de-silting facilities for treating surface run-off and other collected effluents prior to discharge;</li> <li>c) Provision of perimeter protection such as sealing of hoarding footings to avoid run-off from entering the existing storm water drainage system via public road; and</li> <li>d) Provision of measures to prevent discharge into the stream.</li> </ul>
	Noise Impact	<ul style="list-style-type: none"> <li>a) Scheduling of noisy construction activities if necessary to avoid persistent noisy operation;</li> <li>b) Controlling the number of plants use on site;</li> <li>c) Regular maintenance of machines; and</li> <li>d) Use of acoustic barriers if necessary.</li> </ul>
	Waste/ Chemical Management	<ul style="list-style-type: none"> <li>a) Maintenance involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.</li> <li>b) Chemical wastes should be hold by suitable containers with clear label and stored at a safe location.</li> </ul>

## 7. CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

- 7.1 The Environmental Monitoring and Audit (EM&A) Report presents the EM&A works undertaken in December 2021.

#### Air Quality and Construction Noise

- 7.2 No regular monitoring air quality and noise monitoring is required for the Project. No Action/Limit Level exceedance was recorded.

#### Landscape and visual

- 7.3 No non-compliance was recorded in the reporting month.

#### Complaint and Prosecution

- 7.4 No environmental complaints and environmental prosecution were received in the reporting month.
- 7.5 The ET will keep track on the EM&A programme to ensure compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

### Recommendations

- 7.6 According to the environmental audit performed in the reporting month, the following recommendations were made:

#### *Waste/ chemical management*

- To avoid the accumulation of general refuse.

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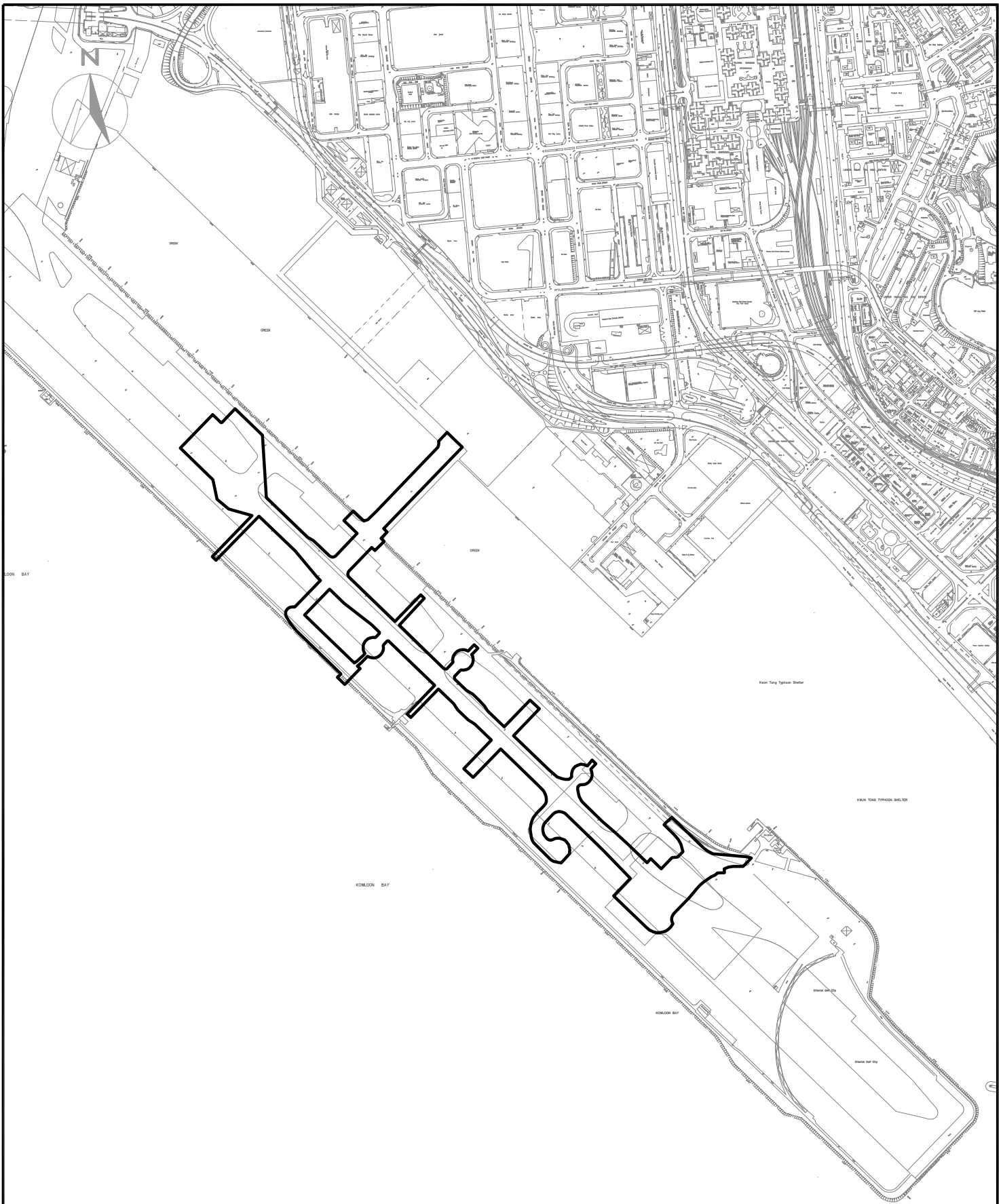
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## FIGURES

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LEGEND:

SITE BOUNDARY

**CINOTECH**  
Cinotech Consultants Limited

KL/2014/01 KAI TAK DEVELOPMENT - STAGE 2  
INFRASTRUCTURE WORKS FOR DEVELOPMENT AT  
SOUTHERN PART OF THE FORMER RUNWAY

**SITE LAYOUT PLAN**

SCALE	1:1000@A4	DATE	MAY 2016
CHECK	JL	DRAWN	JW
JOB No.	MA15046	FIGURE NO.	1
		REV	-

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**APPENDIX A  
ACTION AND LIMIT LEVELS**

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## Appendix A - Action and Limit Levels

**Table A-1 Action and Limit Levels for Air Quality Monitoring**

<b>Monitoring Station</b>	<b>Parameter</b>	<b>Action Level (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Limit Level<sup>(1)(2)</sup> (<math>\mu\text{g}/\text{m}^3</math>)</b>
KTD1	24-hr TSP	177	260
KTD1*	1-hr TSP	285	500

\* 1-hr TSP monitoring should be required in case of complaints.

**Table A-2 Action and Limit Levels for Construction Noise Monitoring**

<b>Time Period</b>	<b>Action Level</b>	<b>Limit Level<sup>(1)(2)</sup></b>
0700-1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A) 70dB(A)/65dB(A)*

Remarks: (1) If works are to be carried out during restricted hours, the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority have to be followed.  
 (2) No regular noise impact monitoring station for this Contract. It is subject to the noise sensitive receiver(s) and additional monitoring work.  
 (\*) 70dB(A) and 65dB(A) for schools during normal teaching periods and school examination periods respectively.

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**APPENDIX B**  
**SUMMARY OF EXCEEDANCE**

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**Contract No. KL/2014/01**

**Kai Tak Development –Stage 2 Infrastructure Works for Developments at the Southern Part of the Former Runway**

**Appendix B – Summary of Exceedance**

**Exceedance Record for Contract No. KL/2014/01**

Reporting Month: December 2021

**(A) Exceedance Record for Construction Dust**

**(NIL in the reporting month)**

**(B) Exceedance Record for Construction Noise**

**(NIL in the reporting month)**

**(C) Exceedance Record for Landscape and Visual**

**(NIL in the reporting month)**

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**APPENDIX C**  
**SITE AUDIT SUMMARY**

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**Contract No. KL/2014/01**

**Kai Tak Development - Stage 2 Infrastructure Works for Developments at the Southern Part of the Former Runway**



**EP-337/2009 & EP-445/2013/A**

**Weekly Site Inspection Record Summary**

**Inspection Information**

Checklist Reference Number	211202
Date	2 Dec 2021 (Thursday)
Time	13:30 – 14:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	<b>B. Water Quality</b>	
	• No environmental deficiency was identified during site inspection	
	<b>C. Air Quality</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>D. Noise</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>E. Waste / Chemical Management</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>F. Visual and Landscape</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>G. Permits /Licenses</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>H. Others</b>	
	No follow-up items are required from the previous site inspection (ref no.: 211126).	

	Name	Signature	Date
Recorded by	Becky Tang		2 Dec 2021
Checked by	Colman Wong		3 Dec 2021

**Contract No. KL/2014/01**

**Kai Tak Development - Stage 2 Infrastructure Works for Developments at the Southern Part of the Former Runway**



**EP-337/2009 & EP-445/2013/A**

**Weekly Site Inspection Record Summary**

**Inspection Information**

Checklist Reference Number	211209
Date	9 Dec 2021 (Thursday)
Time	13:30 – 14:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	<b>B. Water Quality</b>	
	• No environmental deficiency was identified during site inspection	
	<b>C. Air Quality</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>D. Noise</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>E. Waste / Chemical Management</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>F. Visual and Landscape</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>G. Permits /Licenses</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>H. Others</b>	
	No follow-up items are required from the previous site inspection (ref no.: 211202).	

	Name	Signature	Date
Recorded by	Becky Tang		9 Dec 2021
Checked by	Colman Wong		10 Dec 2021



**Contract No. KL/2014/01**

**Kai Tak Development - Stage 2 Infrastructure Works for Developments at the Southern Part of the Former Runway**



**EP-337/2009 & EP-445/2013/A**

**Weekly Site Inspection Record Summary**

**Inspection Information**

Checklist Reference Number	211216
Date	16 Dec 2021 (Thursday)
Time	13:30 – 14:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	<b>B. Water Quality</b>	
	• No environmental deficiency was identified during site inspection	
	<b>C. Air Quality</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>D. Noise</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>E. Waste / Chemical Management</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>F. Visual and Landscape</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>G. Permits /Licenses</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>H. Others</b>	
	No follow-up items are required from the previous site inspection (ref no.: 21 1209).	

	Name	Signature	Date
Recorded by	Becky Tang		16 Dec 2021
Checked by	Colman Wong		17 Dec 2021

**Contract No. KL/2014/01**

**Kai Tak Development - Stage 2 Infrastructure Works for Developments at the Southern Part of the Former Runway**



**EP-337/2009 & EP-445/2013/A**

**Weekly Site Inspection Record Summary**

**Inspection Information**

Checklist Reference Number	211222
Date	22 Dec 2021 (Wednesday)
Time	13:30 – 14:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	<b>B. Water Quality</b>	
	• No environmental deficiency was identified during site inspection	
	<b>C. Air Quality</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>D. Noise</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>E. Waste / Chemical Management</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>F. Visual and Landscape</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>G. Permits /Licenses</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>H. Others</b>	
	No follow-up items are required from the previous site inspection (ref no.: 211216).	

	Name	Signature	Date
Recorded by	Becky Tang		22 Dec 2021
Checked by	Colman Wong		23 Dec 2021

**Contract No. KL/2014/01**

**Kai Tak Development - Stage 2 Infrastructure Works for Developments at the Southern Part of the Former Runway**


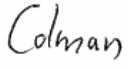
**EP-337/2009 & EP-445/2013/A**

**Weekly Site Inspection Record Summary**

**Inspection Information**

Checklist Reference Number	211230
Date	30 Dec 2021 (Thursday)
Time	13:30 – 14:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	<b>B. Water Quality</b>	
	• No environmental deficiency was identified during site inspection	
	<b>C. Air Quality</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>D. Noise</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>E. Waste / Chemical Management</b>	
	• No environmental deficiency was identified during site inspection.	
	• <b>F. Visual and Landscape</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>G. Permits /Licenses</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>H. Others</b>	
	No follow-up items are required from the previous site inspection (ref no.: 211122).	

	Name	Signature	Date
Recorded by	Becky Tang		30 Dec 2021
Checked by	Colman Wong		31 Dec 2021

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**APPENDIX D**  
**EVENT ACTION PLANS**

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## Appendix D - Event Action Plans

### Event/Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level being exceeded	<ol style="list-style-type: none"> <li>4. Notify ER, IEC and Contractor;</li> <li>5. Carry out investigation;</li> <li>6. Report the results of investigation to the IEC, ER and Contractor;</li> <li>7. Discuss with the IEC and Contractor on remedial measures required;</li> <li>8. 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 by the Contractor and advise the ER accordingly;</li> <li>3. Advise the ER on the effectiveness of 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 proposals to IEC and 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, ER, Contractor and EPD;</li> <li>2. Repeat measurements to confirm findings;</li> <li>3. Increase monitoring frequency;</li> <li>4. Identify source and investigate the cause of exceedance;</li> <li>5. Carry out analysis of Contractor's working procedures;</li> <li>6. Discuss with the IEC, Contractor and ER on remedial measures required;</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;</li> <li>8. If exceedance stops, cease additional monitoring.</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. Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the 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 exceedance until the exceedance is abated.</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. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Submit further proposal if problem still not under control;</li> <li>5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated.</li> </ol> <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>

# Appendix D - Event Action Plans

## Event/Action Plan for Landscape and Visual

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

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**APPENDIX E  
ENVIRONMENTAL MITIGATION  
IMPLEMENTATION SCHEDULE (EMIS)**

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**Appendix E - Summary of Implementation Schedule of Mitigation Measures for Construction Phase**

EIA Ref.	Mitigation Measures	Status
<b>Construction Air Quality</b>		
S3.2 (AEIAR-130/2009)	8 times daily watering of the work site with active dust emitting activities.	^
S4.8 (AEIAR-170/2013)	Control measures stipulated in the approved KTD Schedule 3 EIA Report should be strictly followed.	^
S3.2 (AEIAR-130/2009) and S4.8 (AEIAR-170/2013)	<p>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.</p> <ul style="list-style-type: none"> <li>● Stockpiling site(s) should be lined with impermeable sheeting and bunded. Stockpiles should be fully covered by impermeable sheeting to reduce dust emission.</li> <li>● Misting for the dusty material should be carried out before being loaded into the vehicle.</li> <li>● Any vehicle with an open load carrying area should have properly fitted side and tail boards.</li> <li>● 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.</li> <li>● 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.</li> <li>● 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. Onsite unpaved roads should be compacted and kept free of lose materials.</li> <li>● Vehicle washing facilities should be provided at every vehicle exit point.</li> </ul>	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>



EIA Ref.	Mitigation Measures	Status
	<ul style="list-style-type: none"> <li>● 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.</li> <li>● 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.</li> <li>● 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; and</li> <li>● Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites.</li> </ul>	<p>^</p> <p>^</p> <p>^</p> <p>^</p>
<b>Construction Noise</b>		
S3.3 (AEIAR-130/2009)	Use of quiet PME, movable barriers barrier 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 (AEIAR-130/2009)	<p>Good Site Practice:</p> <ul style="list-style-type: none"> <li>● Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.</li> <li>● Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program.</li> <li>● Mobile plant, if any, should be sited as far away from NSRs as possible.</li> <li>● 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.</li> <li>● 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.</li> <li>● Material stockpiles and other structures should be effectively utilized, wherever</li> </ul>	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>

EIA Ref.	Mitigation Measures	Status
	practicable, in screening noise from on-site construction activities.	
S3.3 (AEIAR-130/2009)	Scheduling of Construction Works during School Examination Period	N/A
S3.8 (AEIAR-170/2013)	Provision of a landscaped deck along Roads D3A & D4A.	N/A
S3.8 (AEIAR-170/2013)	<ul style="list-style-type: none"> <li>● Provision of about 1090 m length of vertical noise barrier (connected to the deck) at Roads D3A &amp; D4A;</li> <li>● Provision of about 60 m length of overhang vertical noise barrier (connected to the deck) at Road D4A; and</li> <li>● Provision of staircases with noise barriers next to Sites 4A1 and 4B1</li> </ul> <p>It should be noted that the exact length of the mitigation measures would be subject to minor refinement during the detailed design stage.</p>	N/A N/A N/A
S3.8 (AEIAR-170/2013)	Non-noise sensitive use areas within Sites 4A1 and 4B1.	N/A
S3.8 (AEIAR-170/2013)	Avoid sensitive façade with openable window facing Road D3A.	N/A
<b>Construction Water Quality</b>		
S3.4 (AEIAR-130/2009) and S5.8 (AEIAR-170/2013)	<p><u>Construction Runoff</u></p> <p>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:</p> <ul style="list-style-type: none"> <li>● use of sediment traps</li> <li>● adequate maintenance of drainage systems to prevent flooding and overflow</li> </ul>	^ ^

EIA Ref.	Mitigation Measures	Status
	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.	^
	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.	^
S5.8 (AEIAR-170/2013)	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.	^
	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.	^
S3.4 (AEIAR-130/2009)	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	^

EIA Ref.	Mitigation Measures	Status
	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 and particularly suited to applications where the influent is pumped.	
S3.4 (AEIAR-130/2009) and S5.8 (AEIAR-170/2013)	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.	^
	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 (AEIAR-130/2009)	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.	^
	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.	^
S3.4 (AEIAR-130/2009) and S5.8 (AEIAR-170/2013)	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	^

EIA Ref.	Mitigation Measures	Status
	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.	
S5.8 (AEIAR-170/2013)	<p><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.</p>	^
	<p><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</p>	^
S3.4 (AEIAR-130/2009)	<p><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.</p>	^
S3.4 (AEIAR-130/2009)	All temporary and permanent drainage pipes and culverts provided 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.	^

EIA Ref.	Mitigation Measures	Status
S3.4 (AEIAR-130/2009)	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.	^
S5.8 (AEIAR-170/2013)	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.	^
S3.4 (AEIAR-130/2009) and S5.8 (AEIAR-170/2013)	<u>Sewage Effluent</u>  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.	^
S5.8	Notices should be posted at conspicuous locations to remind the workers not to discharge	^

EIA Ref.	Mitigation Measures	Status
(AEIAR-170/2013)	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.	
S3.4 (AEIAR-130/2009) and S5.8 (AEIAR-170/2013)	<u>Stormwater Discharges</u>  Minimum distances of 100 m should be maintained between the existing or planned stormwater discharges and the existing or planned seawater intakes.	^
	<u>Debris and Litter</u>  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 and that disposal of any solid materials, litter or wastes to marine waters does not occur.	^
S5.8 (AEIAR-170/2013)	<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 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.	^

EIA Ref.	Mitigation Measures	Status
	<p>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:</p> <ul style="list-style-type: none"> <li>● Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.</li> <li>● Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents.</li> <li>● Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.</li> </ul>	<p>^</p> <p>^</p> <p>^</p> <p>^</p>
<b>Construction Waste Management</b>		
<p>S6.7 (AEIAR-170/2013)</p>	<p>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.</p>	<p>^</p>
<p>S3.5 (AEIAR-130/2009) and S6.7 (AEIAR-170/2013)</p>	<p><b>Good Site Practices</b> 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:</p> <ul style="list-style-type: none"> <li>● Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site</li> <li>● Training of site personnel in proper waste management and chemical waste handling procedures</li> <li>● Provision of sufficient waste disposal points and regular collection for disposal</li> </ul>	<p>^</p> <p>^</p>



EIA Ref.	Mitigation Measures	Status
	<ul style="list-style-type: none"> <li>● Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers</li> <li>● A recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites)</li> <li>● Regular cleaning and maintenance systems, sumps and oil interceptors</li> <li>● Separation of chemical wastes for special handling and appropriate treatment</li> </ul>	<p>^</p> <p>^</p> <p>^</p> <p>^</p>
	<p>Waste Reduction Measures</p> <p>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:</p> <ul style="list-style-type: none"> <li>● Sort C&amp;D waste from demolition of the remaining structures to recover recyclable portions such as metals</li> <li>● 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</li> <li>● 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</li> <li>● Any unused chemicals or those with remaining functional capacity should be recycled</li> <li>● Proper storage and site practices to minimise the potential for damage or contamination of construction materials</li> <li>● Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste</li> <li>● Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.</li> </ul>	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>

EIA Ref.	Mitigation Measures	Status
<p>S3.5 (AEIAR-130/2009)</p>	<p>Construction and Demolition Materials</p> <p>Mitigation measures and good site practices should be incorporated in the contract document to control potential environmental impact from handling and transportation of C&amp;D material. The mitigation measures include:</p> <ul style="list-style-type: none"> <li>● Where it is unavoidable to have transient stockpiles of C&amp;D material within the Project work site pending collection for disposal, the transient stockpiles shall be located away from waterfront or storm drains as far as possible.</li> <li>● Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric.</li> <li>● Skip hoist for material transport should be totally enclosed by impervious sheeting.</li> <li>● Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site.</li> <li>● 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.</li> <li>● 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.</li> <li>● All dusty materials should be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet.</li> <li>● The height from which excavated materials are dropped should be controlled to a minimum practical height to limit fugitive dust generation from unloading.</li> </ul> <p>When delivering inert C&amp;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&amp;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</p>	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>

EIA Ref.	Mitigation Measures	Status
	System for Disposal of Construction and Demolition Materials” should be included as one of the contractual requirement sand 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.	
S3.5 (AEIAR-130/2009)	<p>General Refuse</p> <p>General refuse should be stored in enclosed bins or compaction units separate from C&amp;D material. A licensed waste collector should be employed by the contractor to remove general refuse from the site, separately from C&amp;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</p>	^
<b>Construction Landscape and Visual</b>		
S3.8.12 (AEIAR-130/2009) and S7.9 (AEIAR-170/2013)	<ul style="list-style-type: none"> <li>● Minimized construction area and contractor’s temporary works areas.</li> <li>● All existing trees should be carefully protected during construction.</li> <li>● 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.</li> <li>● Control of night-time lighting.</li> <li>● Erection of decorative screen hoarding.</li> <li>● Reduction of construction period to practical minimum.</li> <li>● Limitation of / Ensuring no run-off into surrounding landscape and adjacent seawater areas.</li> <li>● Temporary or advance landscape should be provided along the temporary access roads to the Cruise Terminal until such time as road D3 is open.</li> </ul>	^ ^ ^  ^ ^ ^ ^ ^

Remarks:	EIA Report (AEIAR-130/2009) – Kai Tak Development	
	EIA Report (AEIAR-170/2013) – Kai Tak Development – Roads D3A & D4A	
	^ Compliance of mitigation measure;	X Non-compliance of mitigation measure;
	N/A Not Applicable at this stage; N/A(1) Not observed;	• Non-compliance but rectified by the contractor;
* Recommendation was made during site audit but improved/rectified by the contractor.	# Recommendation was made during site audit but not yet improved/rectified by the contractor.	

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**APPENDIX F  
SUMMARIES OF ENVIRONMENTAL  
COMPLAINT, WARNING, SUMMON  
AND NOTIFICATION OF SUCCESSFUL  
PROSECUTION**

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**Contract No. KL/2014/01**

**Kai Tak Development –Stage 2 Infrastructure Works for Developments at the Southern Part of the Former Runway**

**Appendix F – Summary of environmental complaint, warning, summon and notification of successful prosecution**

**Reporting Month:** December 2021

**Contract No. KL/2014/01**

<b>Log Ref.</b>	<b>Location</b>	<b>Received Date</b>	<b>Details of Complaint/warning/summon and prosecution</b>	<b>Investigation/Mitigation Action</b>	<b>Status</b>
N/A	N/A	N/A	N/A	N/A	N/A

**Remarks:** No environmental complaint/warning/summon and prosecution were received in the reporting period.

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**APPENDIX G**  
**WASTE GENERATED QUANTITY**

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### Appendix G. Monthly Summary Waste Flow Table

Name of Department: CEDD

Contract No: KL/2014/01

#### Monthly Summary Waste Flow Table for 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	Chemical Waste	Others, e.g. general refuse
	(in tonne)	(in tonne)	(in tonne)	(in tonne)	(in tonne)	(in tonne)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in tonne)
Jan	35.46	0	0	0	35.46	0	0	0	0	0	212.30
Feb	5.63	0	0	0	5.63	0	0	0	0	0	4.18
Mar	0.00	0	0	0	0.00	0	0	0	0	0	2.50
Apr	0.00	0	0	0	0.00	0	0	0	0	0	9.65
May	0.00	0	0	0	0.00	0	0	0	0	0	17.89
June	0.00	0	0	0	0.00	0	0	0	0	0	13.55
Sub-total	41.09	0	0	0	41.09	0	0	0	0	0	260.07
July	0	0	0	0	0.00	0	0	0	0	0	11.6
Aug	8.16	0	0	0	0.00	0	0	0	0	0	8.16
Sept	12.60	0	0	0	0.00	0	0	0	0	0	12.6
Oct	15.69	0	0	0	0.00	0	0	0	0	0	15.69
Nov	23.26	0	0	0	0.00	0	0	0	0	0	23.26
Dec	34.36	0	0	0	0.00	0	0	0	0	0	34.36
Total	135.16	0	0	0	41.09	0	0	0	0	0	365.74

\* Transfer to alternative disposal ground at Lung Kwu Sheung Tan EPD approved recycler



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### **Appendix B**

**Monthly EM&A Report  
For  
Contract No. KL/2015/02  
Kai Tak Development - Stage 5A Infrastructure at Former North Apron Area**

# Civil Engineering and Development Department


**EP-337/2009 – New Distributor Roads Serving the  
Planned KTD**

**Contract No. KLN/2016/04  
Environmental Monitoring Works for  
Contract No. KL/2015/02  
Kai Tak Development – Stage 5A Infrastructure  
at Former North Apron Area**

Monthly EM&A Report

December 2021

(Version 1.1)

Certified By	 _____ (Environmental Team Leader)
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REMARKS:

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

CINOTECH accepts no responsibility for changes made to this report by third parties

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Date 14 January 2022

Our Ref. MCL/ED/0027/2022/C

Cinotech Consultants Limited  
Rm 1710, Technology Park,  
18 On Lai Street, Shatin,  
New Territories,  
Hong Kong

BY EMAILAttn.: Mr. K.S Lee

Dear Sir,

**Contract No. KL/2015/02****Kai Tak Development –Stage 5A Infrastructure at Former North Apron****Verification of Monthly EM&A Report for December 2021**

We refer to your emails dated 11, 13 and 14 January 2022 for the captioned report prepared by the ET.

We have no further comment and hereby verify the Report in accordance with Clause 3.3 of Environmental Permit no. EP-337/2009.

Should you require further information, please do not hesitate to contact me on 3565 4114 or our Toby Wan on 3565 4450.

Assuring you of our best attention at all times.

Yours faithfully,

For and on behalf of

FUGRO TECHNICAL SERVICES LIMITED



Colin K. L. Yung

Independent Environmental Checker

CY/ws

c.c. CEDD –

AECOM –

Attn.: Mr. Ricky Chan

Attn.: Mr. Vincent Yip

Attn.: Mr. Vincent Lee

Attn.: Mr. Teddy Shih

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## EXECUTIVE SUMMARY

### Introduction

1. This is the 60<sup>th</sup> Monthly Environmental Monitoring and Audit Report prepared by Cinotech Consultants Ltd. for “Contract No. KL/2015/02 - Kai Tak Development – Stage 5A Infrastructure at Former North Apron Area” (Hereafter referred to as “the Project”). This contract comprises one Schedule 2 designated project (DP), namely the new distributor road D1 serving the planned KTD. The DP is part of the designated project under Environmental Permit (EP) No.: EP-337/2009 (“New distributor roads serving the planned Kai Tak Development”) respectively. This report documents the findings of EM&A Works conducted during December 2021.
2. With reference to the same principle of EIA report of the Project, air quality monitoring stations within 500m and noise monitoring stations within 300m from the boundary of this Project are considered as relevant monitoring locations. In such regard, the relevant air quality and noise monitoring locations are tabulated in **Table I** (see **Figure 2 and 3** for their locations).

**Table I – Air Quality and Noise Monitoring Stations for this Project**

Locations	Monitoring Stations In accordance with EM&A Manual	Alternative Monitoring Stations
<b>Air Quality Monitoring Stations</b>		
AM2 - Lee Kau Yan Memorial School	Yes (1-hour TSP)	N/A
	No (24-hour TSP)	AM2(A) – Ng Wah Catholic Secondary School
<b>Noise Monitoring Stations</b>		
M3 - Cognitio College	No	M3(A) – The Bridge connecting The Latitude
M4 - Lee Kau Yan Memorial School	Yes	N/A
M5 – Nam Yuen	No	M5(C) – Mercy Grace’s Home

3. The major site activities undertaken in the reporting month included:
- Carry out backfilling works around Staircase ST1 at SKLR Playground
  - Erect scaffolding and construct the top slab of lift shaft at SKLR playground
  - Construct pillar box for electrical supply of SW6
  - Excavate with ELS installation at PERE TTA Stage 4
  - Remedial works for the defects identified by maintenance parties, e.g. DSD, HyD
  - Landscaping works at Road L7 and Road D1
  - Outstanding works for irrigation system at Road L7 and D1
  - Construction of additional street furniture at Road D1 and L7
  - Road marking at Road D1 and L7

### Environmental Monitoring Works

4. Environmental monitoring for the Project was performed in accordance with the EM&A Manual and the monitoring results were checked and reviewed. Site Inspections/Audits were conducted once per week. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.
5. Summary of the non-compliance in the reporting month for the Project is tabulated in **Table II**.

**Table II Non-compliance Recorded for the Project in the Reporting Month**

Parameter	No. of Project-related Exceedance		Action Taken
	Action Level	Limit Level	
1-hr TSP	0	0	N/A
24-hr TSP	0	0	N/A
Noise	0	0	N/A

#### *1-hour & 24-hour TSP Monitoring*

6. All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.
7. All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

#### *Construction Noise Monitoring*

8. All construction noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

## Environmental Licenses and Permits

9. Licenses/Permits granted to the Project include the Environmental Permit (EP) for the Project, EP-337/2009 issued on 23 April 2009. All valid Licenses/Permits for this Project are shown in **Table 6.1**.

- Billing Account for Construction Waste Disposal (A/C# 7026164).
- Effluent Discharge License (WT00027495-2017).
- Registration of Chemical Waste Producer (WPN5213-286-P3271-01).

## Key Information in the Reporting Month

10. Summary of key information in the reporting month is tabulated in **Table III**.

**Table III Summary Table for Key Information in the Reporting Month**

Event	Event Details		Action Taken	Status	Remark
	Number	Nature			
Complaint received	---	---	N/A	N/A	---
Reporting Changes	---	---	N/A	N/A	---
Notifications of any summons & prosecutions received	---	---	N/A	N/A	---

## Future Key Issues

11. The future key environmental issues in the coming two months include:

- Dust generation from stockpiles of dusty materials, exposed site area, excavation
- Works and rock breaking activities;
- Water spraying for dust generating activity and on haul road;
- Proper storage of construction materials on site;
- Storage of chemicals/fuel and chemical waste/waste oil on site;
- Accumulation of general and construction waste on site;
- Noise from operation of the equipment, especially for rock-breaking activities,
- Piling works and machinery on-site; and
- Wastewater and runoff discharge from site.



## 1 INTRODUCTION

### Background

- 1.1. The Kai Tak Development (KTD) is located in the south-eastern part of Kowloon Peninsula, 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. It covers a land area of about 328 hectares. Stage 5A Infrastructure at Former North Apron Area is one of the construction stages of KTD. It contains one Schedule 2 DP including new distributor roads serving the planned KTD. The general layout of the Project is shown in **Figure 1**.
- 1.2. An Environmental Permit (EP) No. EP-337/2009 was issued on 23 April 2009 for new distributor roads serving the planned KTD to Civil Engineering and Development Department as the Permit Holder.
- 1.3. A study of environmental impact assessment (EIA) was undertaken to consider the key issues of air quality, noise, water quality, waste, land contamination, cultural heritage and landscape and visual impact, and identify possible mitigation measures associated with the works. An EIA Report (Register No. AEIAR-130/2009) was approved by the Environmental Protection Department (EPD) on 4 April 2009.
- 1.4. Cinotech Consultants Limited (Cinotech) was commissioned by Civil Engineering and Development Department (CEDD) to undertake the role of the Environmental Team (ET) for the Contract No. KL/2015/02 – Stage 5A Infrastructure at Former North Apron Area. The construction work under KL/2015/02 comprises the construction of part of the Road D1 under the EP (EP-337/2009).
- 1.5. Cinotech Consultants Limited was commissioned by Civil Engineering and Development Department (CEDD) to undertake the Environmental Monitoring and Audit (EM&A) works for the Project. The commencement date of construction of Road D1 (part) under this Contract was on 16 January 2017.

### Project Organizations

- 1.6. Different parties with different levels of involvement in the project organization include:
  - Project Proponent – Civil Engineering and Development Department (CEDD).
  - The Engineer and the Engineer's Representative (ER) – AECOM Asia Co. Ltd (AECOM).
  - Environmental Team (ET) – Cinotech Consultants Limited (Cinotech).
  - Independent Environmental Checker (IEC) – Fugro Technical Services Limited (FTS).
  - Contractor – Peako - Wo Hing Joint Venture (PWHJV).

1.7. The key contacts of the Project are shown in **Table 1.1**.

**Table 1.1 Key Project Contacts**

Party	Role	Contact Person	Position	Phone No.	Fax No.
CEDD	Project Proponent	Mr. CHAN Wai Kit, Ricky	Senior Engineer	2116 3753	2116 0714
AECOM	Engineer's Representative	Mr. Vincent Lee	Senior Resident Engineer	2798 0771	2210 6110
Cinotech	Environmental Team	Mr. K.S Lee	Environmental Team Leader	2151 2091	3107 1388
		Ms. Betty Choi	Audit Team Leader	2151 2072	
FTS	Independent Environmental Checker	Mr. Colin Yung	Independent Environmental Checker	3565 4114	2450 8032
PWHJV	Contractor	Mr. W.M. Wong	Site Agent	6386 3535	2398 8301

### Construction Activities undertaken during the Reporting Month

1.8. The site activities undertaken in the reporting month included:

- Carry out backfilling works around Staircase ST1 at SKLR Playground
- Erect scaffolding and construct the top slab of lift shaft at SKLR playground
- Construct pillar box for electrical supply of SW6
- Excavate with ELS installation at PERE TTA Stage 4
- Remedial works for the defects identified by maintenance parties, e.g. DSD, HyD
- Landscaping works at Road L7 and Road D1
- Outstanding works for irrigation system at Road L7 and D1
- Construction of additional street furniture at Road D1 and L7
- Road marking at Road D1 and L7

1.9. The construction programme for the Project is shown in **Appendix N**.

1.10. The construction programme showing the inter-relationship with environmental protection/mitigation measures are presented in **Table 1.2**.

**Table 1.2 Construction Programme Showing the Inter-Relationship with Environmental Protection/Mitigation Measures**

Construction Works	Major Environmental Impact	Control Measures
Refer to Section 1.8	Noise, dust impact, water quality and waste generation	<ul style="list-style-type: none"> <li>• Sufficient watering of the works site with active dust emitting activities;</li> <li>• Properly cover the stockpiles;</li> <li>• On-site waste sorting and implementation of trip ticket system</li> <li>• Appropriate desilting/sedimentation devices provided on site for treatment before discharge;</li> <li>• Use of quiet plant and well-maintained construction plant;</li> <li>• Provide movable noise barrier;</li> <li>• Well maintain the drainage system to prevent the spillage of wastewater during heavy rainfall;</li> <li>• Provide sufficient mitigation measures as recommended in Approved EIA Report/Lease requirement.</li> </ul>

**Summary of EM&A Requirements**

- 1.11. The EM&A programme requires construction noise monitoring, air quality monitoring, landscape and visual monitoring and environmental site audit. The EM&A requirements for each parameter are described in the following sections, including:
- All monitoring parameters;
  - Action and Limit levels for all environmental parameters;
  - Event Action Plans;
  - Environmental requirements and mitigation measures, as recommended in the EM&A Manual under the EP.
- 1.12. The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 6 of this report.
- 1.13. This report presents the monitoring results, observations, locations, equipment, period, methodology and QA/QC procedures of the required monitoring parameters, namely air quality and noise levels and audit works for the Project during the reporting month.

## 2 AIR QUALITY

### Monitoring Requirements

- 2.1. According to EM&A Manual under the EP, 1-hour and 24-hour TSP monitoring were conducted to monitor the air quality for this Project. For regular impact monitoring, a sampling frequency of at least once in every six days at all of the monitoring stations for 24-hour TSP monitoring. For 1-hour TSP monitoring, the sampling frequency of at least three times in every six days shall be undertaken when the highest dust impact occurs. **Appendix A** shows the established Action/Limit Levels for the environmental monitoring works.

### Monitoring Locations

- 2.2. 1-hour TSP impact dust monitoring was conducted at the air quality monitoring station, AM2 - Lee Kau Yan Memorial School and 24-hour TSP impact dust monitoring were conducted at the air quality monitoring station, AM2(A) - Ng Wah Catholic Secondary School in the reporting month. No Action/Limit Level exceedance was recorded.
- 2.3. **Table 2.1** describes the air quality monitoring locations, which are also depicted in **Figure 2**.

**Table 2.1 Locations for Air Quality Monitoring**

Monitoring Stations	Locations	Location of Measurement
AM2 (1-hour TSP)	Lee Kau Yan Memorial School	Rooftop (about 8/F) Area
AM2(A) (24-hour TSP)	Ng Wah Catholic Secondary School	Rooftop (about 8/F) Area

### Monitoring Equipment

- 2.4. **Table 2.2** summarizes the equipment used in the impact air monitoring programme. Copies of calibration certificates are attached in **Appendix B**.

**Table 2.2 Air Quality Monitoring Equipment**

Equipment	Model and Make	Quantity
Calibrator	• TISCH TE-5025A	1
1-hour TSP Dust Meter	• Sibata Scientific Technology LD-5R	1
HVS Sampler	• TE-5170 c/w of TSP sampling inlet	1
Wind Anemometer	• Davis Instruments 6152	1

### Monitoring Parameters, Frequency and Duration

- 2.5. **Table 2.3** summarizes the monitoring parameters and frequencies of impact dust monitoring for the whole construction period. The air quality monitoring schedule for the reporting month is shown in **Appendix D**.

**Table 2.3 Impact Dust Monitoring Parameters, Frequency and Duration**

Parameters	Frequency
1-hr TSP	Three times / 6 days
24-hr TSP	Once / 6 days

### Monitoring Methodology and QA/QC Procedure

#### *1-hour TSP Monitoring*

#### Measuring Procedures

- 2.6. The measuring procedures of the 1-hour dust meters were in accordance with the Manufacturer's Instruction Manual as follows:

*(Equipment: Sibata Scientific Technology; Model no. LD-3B, LD-5R)*

- The 1-hour dust meter is placed at least 1.3 meters above ground.
- Set POWER to "ON" and make sure that the battery level was not flash or in low level.
- Allow the instrument to stand for about 3 minutes and then the cap of the air sampling inlet has been released.
- Push the knob at MEASURE position.
- Set time/mode setting to [BG] by pushing the time setting switch. Then, start the background measurement by pushing the start/stop switch once. It will take 6 sec. to complete the background measurement.
- Push the time setting switch to change the time setting display to [MANUAL] at the bottom left of the liquid crystal display.
- Finally, push the start/stop switch to stop the measuring after 1 hour sampling.

- Information such as sampling date, time, count value and site condition were recorded during the monitoring period.

### Maintenance/Calibration

- 2.7. The following maintenance/calibration was required for the direct dust meters:

Check the meter at a 3-month interval and calibrate the meter at a 1-year interval throughout all stages of the air quality monitoring.

### *24-hour TSP Monitoring*

#### Instrumentation

- 2.8. High volume (HVS) samplers (Model TE-5170), completed 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). Moreover, the HVS also met all the requirements in section 2.5 of the updated EM&A Manual.

#### Operating/Analytical Procedures

- 2.9. Operating/analytical procedures for the operation of HVS were as follows:

- A horizontal platform was provided with appropriate support to secure the samplers against gusty wind.
- No two samplers were placed less than 2 meters 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 2 meters of separation from walls, parapets and penthouses was required for rooftop samples.
- A minimum of 2 meters separation from any supporting structure, measured horizontally was required.
- No furnaces or incineration flues were nearby.
- Airflow around the sampler was unrestricted.
- The sampler was more than 20 meters from the drip line.
- Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring.

- 2.10. Prior to the commencement of the dust sampling, the flow rate of the high volume sampler was properly set (between 1.1 m<sup>3</sup>/min. and 1.4 m<sup>3</sup>/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.

- 2.11. For TSP sampling, fiberglass filters have a collection efficiency of > 99% for particles of 0.3µm diameter were used.
- 2.12. The power supply was checked to ensure the sampler worked properly. On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the designated air monitoring station.
- 2.13. The filter holding frame was then 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 should be 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 then 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 and sent to the HOKLAS laboratory (High Precision Chemical Testing Ltd.) for weighing. The elapsed time was also recorded.
- 2.18. Before weighing, all filters were equilibrated in a conditioning environment for 24 hours. The conditioning environment temperature should be between 25°C and 30°C and not vary by more than ±3°C; the relative humidity (RH) should be < 50% and not vary by more than ±5%. A convenient working RH is 40%.

#### Maintenance/Calibration

- 2.19. The following maintenance/calibration was required for the HVS:
  - The high volume motors 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 at bi-monthly intervals using TE-5025A Calibration Kit throughout all stages of the air quality monitoring.

**Results and Observations**

- 2.20. All 1-hour and 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.
- 2.21. The weather information for the reporting month is summarized in **Appendix C**.
- 2.22. The monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results are shown in **Appendices E and F** respectively.
- 2.23. The summary of exceedance record in reporting month is shown in **Appendix H**. No exceedance was recorded for the air quality monitoring.
- 2.24. According to our field observations during the monitoring, the major dust source identified at the two designated air quality monitoring stations are road traffic dust, exposed site area and open stockpiles, excavation works and site vehicle movements.
- 2.25. The summary of 1-hour and 24-hour TSP air quality monitoring results during the reporting month are shown in **Appendix E** and **Appendix F** respectively.



### 3 NOISE

#### Monitoring Requirements

- 3.1. According to EM&A Manuals under the EP, construction noise monitoring was conducted to monitor the construction noise arising from the construction activities within KTD. The regular monitoring frequency for each monitoring station shall be on a weekly basis and conduct one set of measurements between 0700 and 1900 hours on normal weekdays. **Appendix A** shows the established Action and Limit Levels for the environmental monitoring works.

#### Monitoring Locations

- 3.2. Three designated monitoring stations were selected for noise monitoring programme. Noise monitoring was conducted at three designated monitoring stations (M3(A), M4, and M5(C)). **Figure 3** shows the locations of these stations.

**Table 3.1 Noise Monitoring Stations**

Monitoring Stations	Locations	Location of Measurement
M3(A)	The Bridge connecting The Latitide	In the middle of the foot bridge connecting The Latitide
M4	Lee Kau Yan Memorial School	Rooftop (about 7/F) Area
M5(C)	Mercy Grace's Home	Ground in front of the building entrance facing Prince Edward Road East (noise monitoring is not allowed on the rooftop from 27 February 2020, due to the coronavirus countermeasure in Mercy Grace's Home)

#### Monitoring Equipment

- 3.3. **Table 3.2** summarizes the noise monitoring equipment. Copies of calibration certificates are provided in **Appendix B**.

**Table 3.2 Noise Monitoring Equipment**

Equipment	Model and Make	Qty.
Integrating Sound Level Meter	• SVANTEK SVAN 957 / 979	3
Calibrator	• Bruel & Kjaer B&K4231	1
	• SOUNDTEK ST-120	1

**Monitoring Parameters, Frequency and Duration**

- 3.4. **Table 3.3** summarizes the monitoring parameters, frequency and total duration of monitoring. The noise monitoring schedule is shown in **Appendix D**.

**Table 3.3 Noise Monitoring Parameters, Frequency and Duration**

Monitoring Stations	Parameter	Period	Frequency	Measurement
M3(A) M4 M5(C)	L <sub>10</sub> (30 min.) dB(A) L <sub>90</sub> (30 min.) dB(A) L <sub>eq</sub> (30 min.) dB(A)	0700-1900 hrs on normal weekdays	Once per week	Façade

**Monitoring Methodology and QA/QC Procedures**

- The Sound Level Meter was set on a tripod at a height of 1.2 m above the ground.
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
  - frequency weighting : A
  - time weighting : Fast
  - time measurement : 30 minutes
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1.0 dB, the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- The wind speed was frequently checked with the portable wind meter.
- At the end of the monitoring period, the L<sub>eq</sub>, L<sub>90</sub> and L<sub>10</sub> were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- Noise measurement was paused temporarily during periods of high intrusive noise if possible and observation was recorded when intrusive noise was not avoided.
- Noise monitoring was cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.

### Maintenance and Calibration

- 3.5. The microphone head of the sound level meter and calibrator were cleaned with a soft cloth at quarterly intervals.
- 3.6. The sound level meter and calibrator were checked and calibrated at yearly intervals.
- 3.7. Immediately prior to and following each noise measurement the accuracy of the sound level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration levels from before and after the noise measurement agree to within 1.0 dB.

### Results and Observations

- 3.8. All construction noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded. The summary of exceedance record in reporting month is shown in **Appendix H**.
- 3.9. The baseline noise level and the Noise Limit Level at each designated noise monitoring station are presented in **Table 3.5**.
- 3.10. Noise monitoring results and graphical presentations are shown in **Appendix G**.
- 3.11. The major noise source identified at the designated noise monitoring stations are shown in **Table 3.4**.

**Table 3.4 Major Noise Source identified at the Designated Noise Monitoring Stations**

Monitoring Stations	Locations	Major Noise Source
M3(A)	The Bridge connecting The Latitude	Traffic Noise Site vehicle movement
M4	Lee Kau Yan Memorial School	Traffic Noise Site vehicle movement Excavation works Piling works Daily school activities
M5(C)	Mercy Grace's Home	Traffic Noise Site vehicle movement

**Table 3.5 Baseline Noise Level and Noise Limit Level for Monitoring Stations**

Station	Baseline Noise Level, dB (A)	Noise Limit Level, dB (A)
M3(A)	N/A <sup>(1)</sup> (at 0700 – 1900 hrs on normal weekdays)	75 (at 0700 – 1900 hrs on normal weekdays)
M4	76.7 <sup>(2)</sup> (at 0700 – 1900 hrs on normal weekdays)	70 (at 0700 – 1900 hrs on normal weekdays)
M5(C)	N/A <sup>(1)</sup> (at 0700 – 1900 hrs on normal weekdays)	75 (at 0700 – 1900 hrs on normal weekdays)

(\*) Noise Limit Level is 65 dB(A) during school examination periods.

Note (1): The background Noise Level was recorded during the Lunch Hour of Construction Site

(i.e. 12:00-13:00) and to be used as the referencing value for compliance checking for Noise Action and Limit Level.

Note (2): The noise level due to the construction work (CNL) was calculated by the following formula:

$$\text{CNL} = 10 \log (10^{\text{MNL}/10} - 10^{\text{BNL}/10})$$

Remarks: MNL = Measured Noise Level, BNL = Baseline Noise Level

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

- 4.1. The EM&A data was compared with the EIA predictions as summarized in **Tables 4.1 to 4.3**.

**Table 4.1 Comparison of 1-hr TSP data with EIA predictions**

Station	Predicted 1-hr TSP conc.		Measured 1-hr TSP conc.	
	Scenario1 (Mid 2009 to Mid-2013), $\mu\text{g}/\text{m}^3$	Scenario2 (Mid 2013 to Late 2016), $\mu\text{g}/\text{m}^3$	Reporting Month (December 2021), $\mu\text{g}/\text{m}^3$	
			Average	Range
AM2 – Lee Kau Yan Memorial School	290	312	39.1	19.0 – 66.0

**Table 4.2 Comparison of 24-hr TSP data with EIA predictions**

Station	Predicted 24-hr TSP conc.		Measured 24-hr TSP conc.	
	Scenario1 (Mid 2009 to Mid-2013), $\mu\text{g}/\text{m}^3$	Scenario2 (Mid 2013 to Late 2016), $\mu\text{g}/\text{m}^3$	Reporting Month (December 2021), $\mu\text{g}/\text{m}^3$	
			Average	Range
AM2(A) – Ng Wah Catholic Secondary School	145	169	84.6	44.1 – 125.6

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

Stations	Predicted Mitigated Construction Noise Levels during Normal Working Hour ( $L_{eq(30min)}$ dB(A))	Reporting Month (December 2021), $L_{eq(30min)}$ dB(A)
M3(A) – The Bridge connecting The Latitude	Not predicted in EIA Report	67.6 - 74.5 <sup>(2)</sup>
M4 – Lee Kau Yan Memorial School	47 – 74	72.1 - 74.1 <sup>(1)</sup>
M5(C) – Mercy Grace's Home	Not predicted in EIA Report	73.1 - 74.8 <sup>(2)</sup>

Remarks:

- (1) Since the baseline noise level was higher than those recorded during the construction period, the recorded noise levels were considered non-valid exceedance of Noise Limit Level.
- (2) Since the background noise level was higher than those recorded during the construction period, the recorded noise levels were considered non-valid exceedance of Noise Limit Level.

- 4.2. The average 1-hour TSP concentrations at AM2 in the reporting month were below the prediction in the approved Environmental Impact Assessment (EIA) Report.
- 4.3. The average 24-hour TSP concentrations at AM2(A) in the reporting month were below the prediction in the approved EIA Report.
- 4.4. The noise monitoring results in the reporting month from M4 were slightly higher than the range of the predicted mitigated construction noise levels in the EIA Report.
- 4.5. Construction noise levels at M3(A) and M5(C) were not predicted in EIA Report.

## **5 LANDSCAPE AND VISUAL**

### **Monitoring Requirements**

- 5.1. According to EM&A Manual of the Kai Tak Development EIA Study, ET shall monitor and audit the contractor's operation during the construction period on a weekly basis, and to report on the contractor's compliance.

### **Results and Observations**

- 5.2. Site audits were conducted on a weekly basis to monitor the timely implementation of landscape and visual mitigation measures within the site boundaries of this Project. The summaries of site audits are attached in **Appendix I**.
- 5.3. No non-compliance of the landscape and visual impact was recorded in the reporting month.
- 5.4. Should non-compliance of the landscape and visual impact occur, action in accordance with the action plan presented in **Appendix J** shall be performed.

## 6 ENVIRONMENTAL INSPECTION

### Site Inspections

- 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. The summaries of site inspections are attached in **Appendix I**.
- 6.2. Site inspections were conducted on 8, 13, 20 and 28 December 2021 in the reporting month. A joint site inspection with the representative of IEC, ER, the Contractor and the ET was conducted on 8 December 2021. The details of the observations during site inspection are summarized in **Table 6.2**.

### Review of Environmental Monitoring Procedures

- 6.3. The monitoring works conducted by the monitoring team were inspected regularly. The following observations have been recorded for the monitoring works:

#### *Air Quality Monitoring*

- The monitoring team recorded all observations around the monitoring stations within and outside the construction site.
- The monitoring team recorded the temperature and weather conditions on the monitoring days.

#### *Noise Monitoring*

- The monitoring team recorded all observations around the monitoring stations, which might affect the monitoring result.
- Major noise sources were identified and recorded. Other intrusive noise attributing to the result was trimmed off by pausing the monitoring temporarily.

### Status of Environmental Licensing and Permitting

- 6.4. All permits/licenses obtained for the Project are summarized in **Table 6.1**.



**Table 6.1 Summary of Environmental Licensing and Permit Status**

Permit No.	Valid Period		Status
	From	To	
<b>Environmental Permit (EP)</b>			
EP-337/2009	23 Apr 2009	N/A	Valid
<b>Effluent Discharge License</b>			
WT00027495-2017	28 Mar 2017	31 Mar 2022	Valid
<b>Billing Account for Construction Waste Disposal</b>			
A/C# 7026164	20 Oct 2016	N/A	Valid
<b>Registration of Chemical Waste Producer</b>			
WPN5213-229-P3271-01	14 Aug 2017	N/A	Valid
<b>Construction Noise Permit (CNP)</b>			
GW-RE0915-19	8 Nov 2019	4 May 2020	Expired
GW-RE0984-19	15 Dec 2019	24 Feb 2020	Expired
GW-RE0083-20	1 Mar 2020	1 June 2020	Expired
GW-RE0266-20	2 May 2020	31 Jul 2020	Expired
GW-RE0779-21	30 Jul 2021	30 Nov 2021	Expired
GW-RE0858-21	31 Jul 2021	30 Aug 2021	Expired

**Status of Waste Management**

- 6.5. The amount of wastes generated by the major site activities of this Project during the reporting month is shown in **Appendix M**.

**Implementation Status of Environmental Mitigation Measures**

- 6.6. During site inspections in the reporting month, no non-conformance was identified. ET weekly site inspections were carried out during the reporting month and the observations and recommendations are summarized in **Table 6.2**.

**Table 6.2 Observations and Recommendations of Site Inspections**

<b>Parameters</b>	<b>Date</b>	<b>Observations and Recommendations</b>	<b>Follow-up/Rectification</b>
<i>Water Quality</i>	N/A	No environmental deficiency was identified in the reporting period.	N/A
<i>Air Quality</i>	N/A	No environmental deficiency was identified in the reporting period.	N/A
	N/A	No environmental deficiency was identified in the reporting period.	N/A
<i>Noise</i>	N/A	No environmental deficiency was identified in the reporting period.	N/A
<i>Waste/ Chemical Management</i>	N/A	No environmental deficiency was identified in the reporting period.	N/A
<i>Landscape and Visual</i>	N/A	No environmental deficiency was identified in the reporting period.	N/A
<i>Permits/ Licenses</i>	N/A	No environmental deficiency was identified in the reporting period.	N/A

### Summary of Mitigation Measures Implemented

- 6.7. An updated summary of the EMIS is provided in **Appendix K**.

### Implementation Status of Event Action Plans

- 6.8. The Event Action Plans for air quality, noise and landscape and visual are presented in **Appendix J**.

#### 1-hr TSP Monitoring

- 6.9. No Action/Limit Level exceedance was recorded in the reporting month.

#### 24-hr TSP Monitoring

- 6.10. No Action/Limit Level exceedance was recorded in the reporting month.

#### Construction Noise

- 6.11. No Action/Limit Level exceedance was recorded in the reporting month.

Landscape and visual

6.12. No non-compliance was recorded in the reporting month.

**Summary of Complaint, Warning, Notification of any Summons and Successful Prosecution**

6.13. The summaries of environmental complaint, warning, summon and notification of successful prosecution for the Project is presented in **Appendix L**.

## **7 FUTURE KEY ISSUES**

### **7.1. Major site activities undertaken for the coming two months include:**

- Carry out backfilling works around Staircase ST1 at SKLR Playground
- Install steel staircase cover at SKLR Playground
- Install lift glazing panel at SKLR Playground
- Carry out structural works of subway at PERE TTA Stages 3 & 4
- Preparation works for road-opening of Road D1 and L7
- Additional works as requested by maintenance parties
- Construction of additional street furniture at Road D1 and L7
- Construction of vehicle gates and chain-link fence

### **7.2. Key environmental issues in the coming month include:**

- Wastewater and runoff discharge from site;
- Regular removal of silt, mud and sand along u-channels and sedimentation tanks;
- Review and implementation of temporary drainage system for the surface runoff;
- Noise from operation of the equipment, especially for rock-breaking activities, piling works and machinery on-site;
- Dust generation from stockpiles of dusty materials, exposed site area, excavation works and rock breaking activities;
- Water spraying for dust generating activity and on haul road;
- Proper storage of construction materials on site;
- Storage of chemicals/fuel and chemical waste/waste oil on site; and
- Accumulation of general and construction waste on site.

7.3. The tentative major site activities is mentioned in Section 7.1 of this report. The impact prediction and control measures for the coming two months are summarized as follows:

Air quality impact (dust)

- Frequent watering of haul road and unpaved/exposed areas;
- Frequent watering or covering stockpiles with tarpaulin or similar means; and
- Watering of any earth moving activities.

Water quality impact (surface runoff)

- Diversion of the collected effluent to de-silting facilities for treatment prior to discharge to public storm water drains;
- Provision of adequate de-silting facilities for treating surface run-off and other collected effluents prior to discharge;
- Provision of perimeter protection such as sealing of hoarding footings to avoid run-off from entering the existing storm water drainage system via public road; and
- Provision of measures to prevent discharge into the stream.

Noise Impact

- Scheduling of noisy construction activities if necessary to avoid persistent noisy operation;
- Controlling the number of plants use on site;
- Regular maintenance of machines; and
- Use of acoustic barriers if necessary.

**Monitoring Schedule for Next Month**

7.4. The tentative environmental monitoring schedules for next month are shown in **Appendix D**.

## **8 CONCLUSIONS AND RECOMMENDATIONS**

### **Conclusions**

- 8.1. Environmental monitoring works were performed in the reporting month and all monitoring results were checked and reviewed.

#### 1-hr TSP Monitoring

- 8.2. All 1-hr TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

#### 24-hr TSP Monitoring

- 8.3. All 24-hr TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

#### Construction Noise Monitoring

- 8.4. All construction noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

#### Landscape and visual

- 8.5. No non-compliance was recorded in the reporting month.

#### Complaint and Prosecution

- 8.6. No environmental complaint and environmental prosecution was received in the reporting month.

## **Recommendations**

8.7. According to the environmental audit performed in the reporting month, the following recommendations were made:

### *Water Quality*

- The public drainage gully within the construction site shall be bounded by sand bags.

### *Air Quality*

- The Contractor should cover the dusty material by dust screen.

### *Waste/Chemical Management*

- The Contractor should store the construction/chemical material at the proper place.
- The Contractor was reminded to remove accumulated waste from the site.

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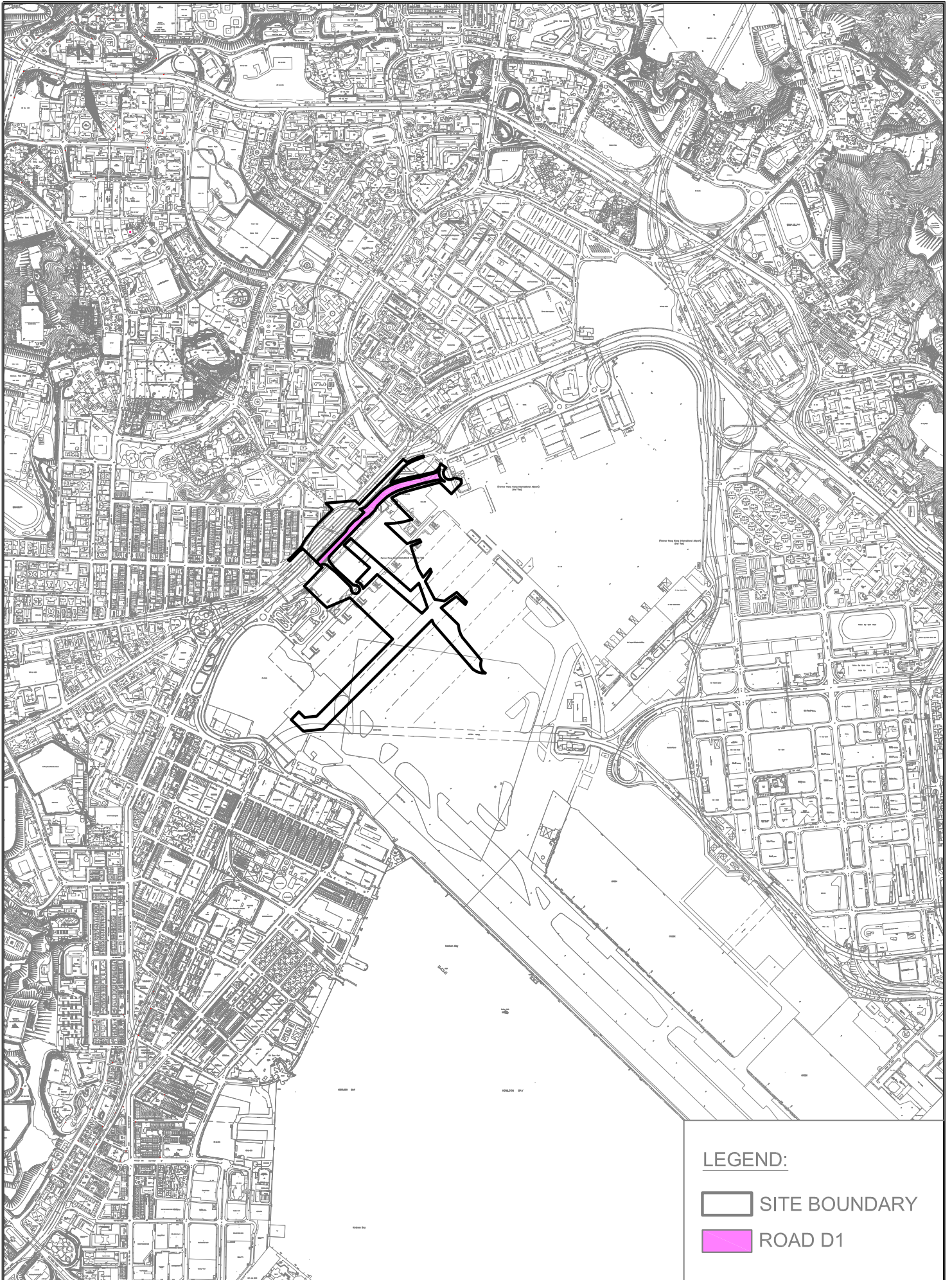
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## FIGURES

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**LEGEND:**

 SITE BOUNDARY

 ROAD D1

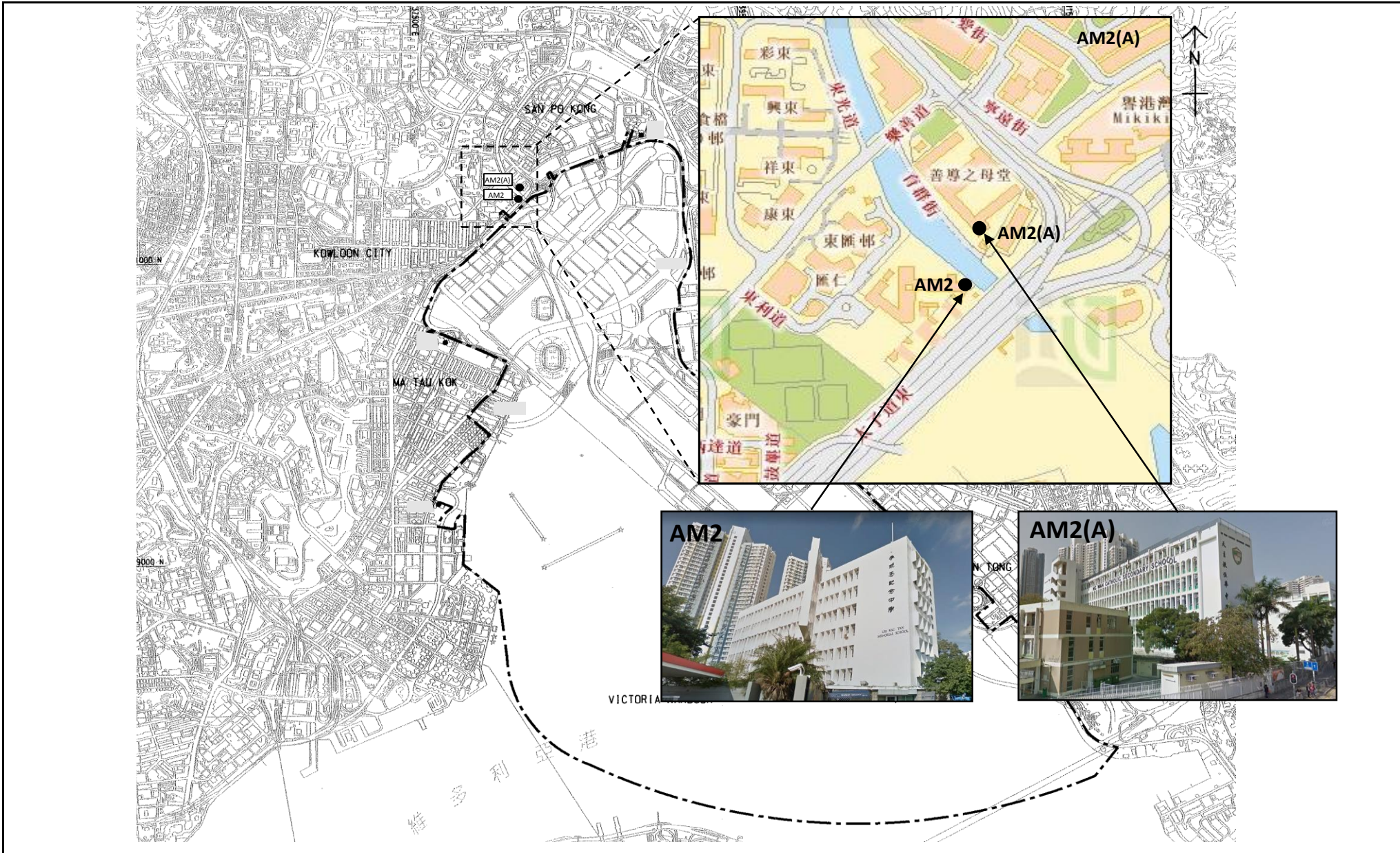


KL/2015/02 KAI TAK - STAGE 5A INFRASTRUCTURE  
AT FORMER NORTH APRON AREA

**SITE LAYOUT PLAN**

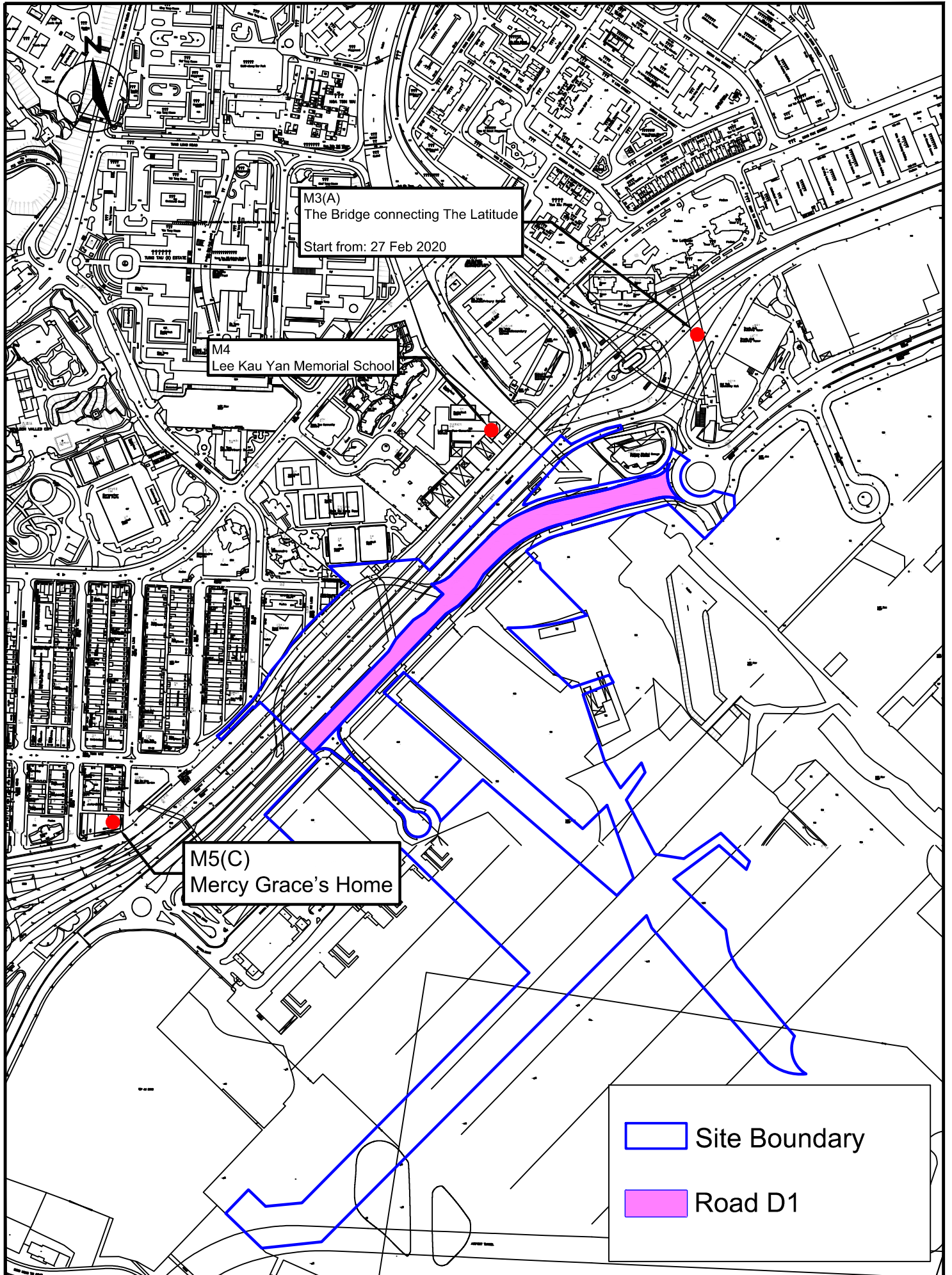
SCALE	1:1500@A4	DATE	DEC 2016
CHECK	KC	DRAWN	JW
JOB No.	MA16043	FIGURE NO.	1
		REV	-





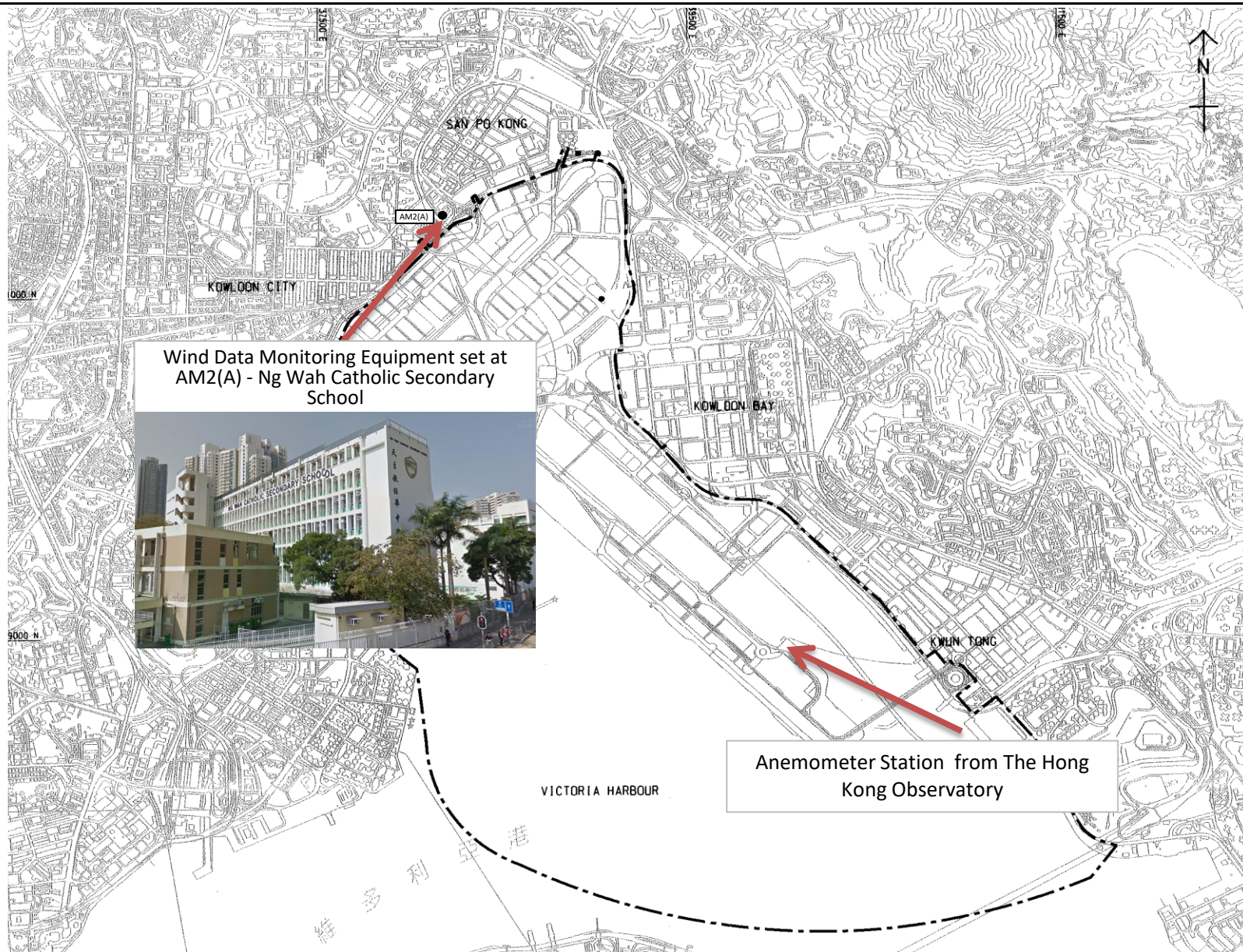
Title	Contract No. KLN/2016/04		Scale	Project	CINOTECH
	Environmental Monitoring Works for Contract No. KL/2015/02		N.T.S	No. MA16043	
Kai Tak Development – Stage 5A Infrastructure at Former North Apron Area			Date	Figure	
Location of Air Quality Monitoring Stations			Aug-17	2	





SCALE	1:5000@A4	DATE	Mar 2020
CHECK	KC	DRAWN	CC
JOB No.	MA16043	FIGURE NO.	3
		REV	-





Wind Data Monitoring Equipment set at AM2(A) - Ng Wah Catholic Secondary School



Anemometer Station from The Hong Kong Observatory

Title Contract No. KLN/2016/04 Environmental Monitoring Works for Contract No. KL/2015/02 Kai Tak Development – Stage 5A Infrastructure at Former North Apron Area Location of Wind Data Monitoring Equipment	Scale	N.T.S	Project No.	MA16043
	Date	Aug-17	Figure	4



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**APPENDIX A  
ACTION AND LIMIT LEVELS FOR AIR  
QUALITY AND NOISE**

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## Appendix A - Action and Limit Levels

**Table A-1 Action and Limit Levels for 1-Hour TSP**

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AM2	346	500

**Table A-2 Action and Limit Levels for 24-Hour TSP**

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AM2(A)	157	260

**Table A-3 Action and Limit Levels for Construction Noise**

Time Period	Action Level	Limit Level
0700-1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A) 70dB(A)/65dB(A)*

Remarks: 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. \*70dB(A) and 65dB(A) for schools during normal teaching periods and school examination periods, respectively.

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**APPENDIX B-1  
COPIES OF CALIBRATION  
CERTIFICATES (AIR)**

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**Certificate of Calibration**

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler


Description: Digital Dust Indicator Date of Calibration 2-Dec-21  
 Manufacturer: Sibata Scientific Technology LTD. Validity of Calibration Record 2-Feb-22  
 Model No.: LD-5R  
 Serial No.: 972780  
 Equipment No.: SA-01-09 Sensitivity 0.001 mg/m3  
 High Volume Sampler No.: A-01-03 Before Sensitivity Adjustment 739 CPM  
 Tisch Calibration Orifice No.: 3864 After Sensitivity Adjustment 739 CPM

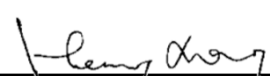
Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration (µg/m <sup>3</sup> ) X-axis	Mass concentration (µg/m <sup>3</sup> ) Y-axis
1	64.0	123.8
2	59.0	117.9
3	51.0	109.0
<b>Average</b>	<b>58.0</b>	<b>116.9</b>
<b>By Linear Regression of Y on X</b> Slope , mw = <u>1.1360</u> Intercept, bw = <u>51.0093</u> Correlation coefficient* = <u>0.9999</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler (µg/m <sup>3</sup> )	116.9	
Particulate Concentration by Dust Meter (µg/m <sup>3</sup> )	58.0	
Measuring time, (min)	60.0	
Set Correlation Factor , SCF		
SCF = [ K=High Volume Sampler / Dust Meter, (µg/m <sup>3</sup> ) ]	<u>2.0</u>	

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

**Those filter papers are weighted by HOKLAS laboratory (HPCT Limited)**

Calibrated by:   
 Technical Officer (Wong Shing Kwai)

Approved by:   
 Project Manager (Henry Leung)





<b>RECALIBRATION DUE DATE:</b>
<b>January 11, 2022</b>

# Certificate of Calibration

Calibration Certification Information			
Cal. Date: January 11, 2021	Rootsmeter S/N: 438320	Ta: 297	°K
Operator: Jim Tisch		Pa: 750.1	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: 3864		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4470	3.2	2.00
2	3	4	1	1.0210	6.4	4.00
3	5	6	1	0.9140	8.0	5.00
4	7	8	1	0.8670	8.8	5.50
5	9	10	1	0.7140	12.9	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left( \frac{Ta}{Pa} \right)}$ (y-axis)
0.9860	0.6814	1.4073	0.9957	0.6881	0.8899
0.9818	0.9616	1.9902	0.9915	0.9711	1.2585
0.9797	1.0719	2.2251	0.9893	1.0824	1.4071
0.9786	1.1288	2.3337	0.9883	1.1399	1.4757
0.9732	1.3630	2.8146	0.9828	1.3765	1.7798
<b>QSTD</b>	m=	<b>2.06566</b>	<b>QA</b>	m=	<b>1.29348</b>
	b=	<b>0.00315</b>		b=	<b>0.00199</b>
	r=	<b>0.99996</b>		r=	<b>0.99996</b>

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

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

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

# High-Volume TSP Sampler

## 5-POINT CALIBRATION DATA SHEET



File No. MA16043/13/0026

Project No. AM2(A) - Ng Wah Catholic Secondary School  
 Date: 6-Nov-21 Next Due Date: 6-Jan-22 Operator: SK  
 Equipment No.: A-01-13 Model No.: TE-5170 Serial No. 1352

Ambient Condition			
Temperature, Ta (K)	<b>299.4</b>	Pressure, Pa (mmHg)	<b>757.5</b>

Orifice Transfer Standard Information					
Serial No.	3864	Slope, mc	0.05846	Intercept, bc	-0.00313
Last Calibration Date:	11-Jan-21	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	11-Jan-22	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	DH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	DW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	<b>13.0</b>	3.59	61.48	<b>10.4</b>	3.21
2	<b>10.9</b>	3.29	56.30	<b>8.4</b>	2.89
3	<b>8.0</b>	2.81	48.12	<b>5.6</b>	2.36
4	<b>5.4</b>	2.31	39.65	<b>3.4</b>	1.84
5	<b>3.3</b>	1.81	31.00	<b>1.9</b>	1.37

**By Linear Regression of Y on X**

Slope, mw = 0.0608 Intercept, bw = -0.5442

Correlation coefficient\* = 0.9994

\*If Correlation Coefficient < 0.990, check and recalibrate.

**Set Point Calculation**

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W =  $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$  4.32

Remarks: \_\_\_\_\_

Conducted by: Wong Shing Kwai Signature:  Date: 6-Nov-21

Checked by: Henry Leung Signature:  Date: 6-Nov-21

## Certificate of Calibration - Wind Monitoring Station

Description: Ng Wah Catholic Secondary School - Weather Stations  
 Manufacturer: Davis Instruments  
 Model No.: Davis 6152, Vantage Pro2  
 Serial No.: BC180522050  
 Equipment No.: SA-03-03  
 Date of Calibration: 8-Oct-2021  
 Next Due Date: 8-Apr-2022

### 1. Performance check of Wind Speed


Wind Speed, m/s		Difference D (m/s)
Wind Speed Reading (V1)	Anemometer Value (V1)	$D = V1 - V2$
0.0	0.0	0.0
1.5	1.5	0.0
2.0	2.1	-0.1
3.3	3.4	-0.1

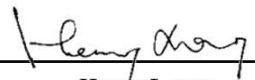
### 2. Performance check of Wind Direction

Wind Direction (°)		Difference D (°)
Wind Direction Reading (V1)	Marine Compass Value (V1)	$D = W1 - W2$
0	0	0.0
90	90	0.0
180	180	0.0
270	270	0.0

### Test Specification:

1. Performance Wind Speed Test - The wind meter was on-site calibrated against the anemometer
2. Performance Wind Direction Test - The wind meter was on-site calibrated against the marine compass at four direction

Calibrated by:   
 Wong Shing Kwai

Approved by:   
 Henry Leung

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**APPENDIX B-2  
COPIES OF CALIBRATION  
CERTIFICATES (NOISE)**

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## Calibration Certificate

0025915

Customer : Cinotech Consultants Limited RM 1710, Technology Park, 18 On Lai Street, Shatin, N.T. Hong Kong	Object 1 : SVAN959 SLM Serial No. /Ref. No. : 11275 / N-08-01 Object 2 : Microphone Serial No. /Ref. No. : 22452
Customer Code : SVEC09005	Manufacturer : SVANTEK
Date of calibration: 22/01/2021 Date of the recommended re-calibration: 22/01/2022	Certificate No.: 0025915 Handle by: E0002

### Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	93.9dB	-0.1dB	+/- 1.5dB	1
114.0dB	113.8dB	-0.2dB	+/- 1.5dB	1

### Measuring equipment

index	Calibrator / Master	Traceability
1	Master Sound Meter, SVAN949,sn:8571	IEC61672
2	Sound Calibrator, SV30A sn:32580	IEC60942

### Ambient conditions

Temperature (20...26)°C Humidity (20...60)%RH

### Measuring procedure

Calibrated by Type 1 Sound Calibrator with Master Sound Level Meter under 1kHz Frequency.

### Uncertainty

+/- 0.2 dB for probability not less than 95%.

### Conformity

1. The resulted values were those obtained at the time of test and applies only to the item calibrated.
2. The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3. The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
4. HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5. The calibrations certificate may not be reproduced.

Measured value(s) **within** the allowable deviation.

Performed by

Calibration Technician

Approved by

Quality Manager



## Calibration Certificate

0025913

Customer : Cinotech Consultants Limited RM 1710, Technology Park, 18 On Lai Street, Shatin, N.T. Hong Kong	Object 1 : SVAN957 SLM Serial No. /Ref. No. : 23852 / N-08-11 Object 2 : Microphone Serial No. /Ref. No. : 35989
Customer Code : SVEC09005	Manufacturer : Svantek
Date of calibration: 22/01/2021 Date of the recommended re-calibration: 22/01/2022	Certificate No.: 0025913 Handle by: E0002

### Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	93.5dB	-0.5dB	+/- 1.5dB	1
114.0dB	113.3dB	-0.7dB	+/- 1.5dB	1

### Measuring equipment

index	Calibrator / Master	Traceability
1	Master Sound Meter, SVAN949,sn:8571	IEC61672
2	Sound Calibrator, SV30A sn:32580	IEC60942

### Ambient conditions

Temperature (20...26)°C

Humidity (20...60)%RH

### Measuring procedure

Calibrated by Type 1 Sound Calibrator with Master Sound Level Meter under 1kHz Frequency.

### Uncertainty


+/- 0.2dB for probability not less than 95%.

### Conformity


- 1.The resulted values were those obtained at the time of test and applies only to the item calibrated.
- 2.The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
- 3.The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
- 4.HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
- 5.The calibrations certificate may not be reproduced.

Measured value(s) **within** the allowable deviation.

Performed by

  
\_\_\_\_\_  
Calibration Technician

Approved by

  
\_\_\_\_\_  
Quality Manager



## Calibration Certificate

0025914

Customer : Cinotech Consultants Limited RM 1710, Technology Park, 18 On Lai Street, Shatin, N.T. Hong Kong	Object 1 : SVAN957 SLM Serial No. /Ref. No. : 23851 / N-08-12 Object 2 : Microphone Serial No. /Ref. No. : 43676
Customer Code : SVEC09005	Manufacturer : Svantek
Date of calibration: 22/01/2021 Date of the recommended re-calibration: 22/01/2022	Certificate No.: 0025914 Handle by: E0002

### Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	93.6dB	-0.4dB	+/- 1.5dB	1
114.0dB	113.5dB	-0.5dB	+/- 1.5dB	1

### Measuring equipment

index	Calibrator / Master	Traceability
1	Master Sound Meter, SVAN949,sn:8571	IEC61672
2	Sound Calibrator, SV30A sn:32580	IEC60942

### Ambient conditions

Temperature (20...26)°C

Humidity (20...60)%RH

### Measuring procedure

Calibrated by Type 1 Sound Calibrator with Master Sound Level Meter under 1kHz Frequency.

### Uncertainty

+/- 0.2 dB for probability not less than 95%.

### Conformity

- 1.The resulted values were those obtained at the time of test and applies only to the item calibrated.
- 2.The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
- 3.The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
- 4.HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
- 5.The calibrations certificate may not be reproduced.

Measured value(s) **within** the allowable deviation.

Performed by

Calibration Technician

Approved by

Quality Manager





# Calibration Certificate

0025917

Customer : Cinotech Consultants Limited RM 1710, Technology Park, 18 On Lai Street, Shatin, N.T. Hong Kong	Object 1 : B&K4231 sound calibrator Serial No. /Ref. No. : 2326353 / N-02-01 Object 2 : Serial No. /Ref. No. :
Customer Code : SVEC09005	Manufacturer : Bruel & Kjaer
Date of calibration: 22/01/2021 Date of the recommended re-calibration: 22/01/2022	Certificate No.: 0025917 Handle by: E0002

## Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	94.0dB	0.0dB	+/- 0.2dB	1
114.0dB	114.1dB	+0.1dB	+/- 0.2dB	1

## Measuring equipment

index	Calibrator / Master	Traceability
1	Master Sound Meter, SVAN949,sn:8571	IEC61672
2	Sound Calibrator, SV30A sn:32580	IEC60942

## Ambient conditions

Temperature (20...26)°C Humidity (20...60)%RH

## Measuring procedure

Calibrated by Type 1 Sound Level Meter and 1kHz Sound Source .

## Uncertainty

+/- 0.2 dB for probability not less than 95%.

## Conformity


- 1.The resulted values were those obtained at the time of test and applies only to the item calibrated.
- 2.The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
- 3.The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
- 4.HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
- 5.The calibrations certificate may not be reproduced.

Measured value(s) **within** the allowable deviation.

Performed by

  
\_\_\_\_\_  
Calibration Technician

Approved by

  
\_\_\_\_\_  
Quality Manager



**High Precision Chemical Testing Ltd.**

Rm 1904, Technology Park  
18 On Lai Street, Shatin  
NT, Hong Kong  
Tel: +852 3841 4388 Website: <https://www.hpct.com.hk>



Report No. : 00161  
Application No. : HP00041

Issue Date : 16 Nov 2021

**Certificate of Calibration**

Applicant : Cinotech Consultants Limited  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Sample Description : Submitted equipment stated to be Sound Level Calibrator.

Equipment No.: : N-13-03

Manufacturer: : SOUNDTEK

Other information : 

Model No.	ST-120
Serial No.	181001637

Date Received : 05 Nov 2021

Test Period : 08 Nov 2021 to 12 Nov 2021

Test Requested : Performance checking for Sound Level Calibrator

Test Method : The Sound Level Meter and Calibrator has been calibrated in accordance with the documented procedures and using standard and instrument which are recommended by the manufacturer, or equivalent.

Test conditions : Room Temperature: 22-25 degree Celsius  
Relative Humidity: 35-70%

Test Result : Refer to the test result(s) on page 2.

Remark : **1. Information of the sample description provided by the Applicant.**  
**2. The result(s) relate only to the items tested or calibrated.**

*For and on behalf of*  
**HIGH PRECISION CHEMICAL TESTING LIMITED**

---

Lee Wai Kit  
Laboratory Manager

## High Precision Chemical Testing Ltd.

Rm 1904, Technology Park  
18 On Lai Street, Shatin  
NT, Hong Kong  
Tel: +852 3841 4388 Website: <https://www.hpct.com.hk>



Report No. : 00161  
Application No. : HP00041

Issue Date : 16 Nov 2021

### Certificate of Calibration

Measuring equipment :

Description	Sound Calibrator
Manufacturer	Brüel & Kjær
Model No.	TYPE 4231
Serial No.	2326353
Equipment No.	N-02-01

Description	Sound Meter
Manufacturer	BSWA Technology
Model No.	BSWA 308
Serial No.	570188
Microphone No.	570608
Equipment No.	N-12-03

Test Result :

Reference value, dB	Indication value, dB	Deviation, dB	Allowed deviation, dB
94.0	94.2	+0.2	± 0.3
114.0	114.4	+0.4	± 0.5

**Note** : 1. "Instrument Readings" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.  
2. The indication value was obtained from the average of ten replicated measurement.

- End of report -

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**APPENDIX C**  
**WEATHER INFORMATION**

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APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

December 2021

Date	Mean Pressure (hPa)	Air Temperature	Mean Relative Humidity (%)	Precipitation (mm)
		Mean (°C)		
1-Dec-21	1021.5	17.3	40	0
2-Dec-21	1021.8	17.4	42	0
3-Dec-21	1021.5	18.0	35	0
4-Dec-21	1022.2	18.1	46	0
5-Dec-21	1021.2	19.1	55	0
6-Dec-21	1020.3	19.2	59	0
7-Dec-21	1020.9	19.9	65	0
8-Dec-21	1022.3	20.1	67	0
9-Dec-21	1022.3	20.2	72	0
10-Dec-21	1020.7	20.9	73	0
11-Dec-21	1020.8	21.4	74	0
12-Dec-21	1021.0	21.5	75	0
13-Dec-21	1021.6	19.4	67	0
14-Dec-21	1018.6	20.5	72	Trace
15-Dec-21	1016.1	21.5	78	0.2
16-Dec-21	1015.8	23.2	81	Trace
17-Dec-21	1018.9	21.7	69	0
18-Dec-21	1022.8	18.1	58	0
19-Dec-21	1021.8	17.9	51	0
20-Dec-21	1017.6	17.2	78	9.4
21-Dec-21	1013.5	17.3	88	2.4
22-Dec-21	1016.5	19.3	80	Trace
23-Dec-21	1016.8	19.9	77	0.8
24-Dec-21	1017.2	19.9	84	1.7
25-Dec-21	1021.2	19.6	75	Trace
26-Dec-21	1025.5	15.0	78	3.5
27-Dec-21	1027.1	12.0	81	1.3
28-Dec-21	1024.4	15.3	74	0.2
29-Dec-21	1023.2	18.4	74	0
30-Dec-21	1024.6	18.1	77	0
31-Dec-21	1025.0	18.0	78	Trace

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

December 2021			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
1-Dec-21	0:00	0.4	ESE
1-Dec-21	1:00	0.4	NNW
1-Dec-21	2:00	0.4	ESE
1-Dec-21	3:00	0.4	SE
1-Dec-21	4:00	0.4	SE
1-Dec-21	5:00	0.4	SE
1-Dec-21	6:00	0.4	SE
1-Dec-21	7:00	1.3	ESE
1-Dec-21	8:00	0.4	SE
1-Dec-21	9:00	0.4	NW
1-Dec-21	10:00	0.4	NW
1-Dec-21	11:00	1.3	NNW
1-Dec-21	12:00	0.9	NNW
1-Dec-21	13:00	1.3	NNW
1-Dec-21	14:00	1.3	NNW
1-Dec-21	15:00	1.3	NNE
1-Dec-21	16:00	1.3	NNE
1-Dec-21	17:00	1.8	ENE
1-Dec-21	18:00	1.3	SE
1-Dec-21	19:00	1.3	NE
1-Dec-21	20:00	1.8	NE
1-Dec-21	21:00	1.8	SE
1-Dec-21	22:00	2.2	SE
1-Dec-21	23:00	0.9	N
2-Dec-21	0:00	1.3	E
2-Dec-21	1:00	1.3	ESE
2-Dec-21	2:00	1.3	E
2-Dec-21	3:00	1.3	E
2-Dec-21	4:00	1.8	E
2-Dec-21	5:00	1.3	E
2-Dec-21	6:00	1.3	E
2-Dec-21	7:00	1.8	ESE
2-Dec-21	8:00	1.8	E
2-Dec-21	9:00	2.2	E
2-Dec-21	10:00	1.3	SE
2-Dec-21	11:00	3.1	SE
2-Dec-21	12:00	3.1	E
2-Dec-21	13:00	3.6	ESE
2-Dec-21	14:00	2.2	E
2-Dec-21	15:00	1.8	E
2-Dec-21	16:00	1.8	ESE
2-Dec-21	17:00	1.8	ESE
2-Dec-21	18:00	1.8	E
2-Dec-21	19:00	1.8	ESE
2-Dec-21	20:00	1.8	E
2-Dec-21	21:00	1.3	W
2-Dec-21	22:00	1.3	W
2-Dec-21	23:00	1.3	W

December 2021			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
3-Dec-21	0:00	0.9	W
3-Dec-21	1:00	0.9	W
3-Dec-21	2:00	0.9	NNW
3-Dec-21	3:00	0.9	ENE
3-Dec-21	4:00	0.9	NW
3-Dec-21	5:00	1.8	W
3-Dec-21	6:00	1.3	W
3-Dec-21	7:00	1.3	W
3-Dec-21	8:00	1.3	NNW
3-Dec-21	9:00	1.8	NW
3-Dec-21	10:00	1.3	W
3-Dec-21	11:00	1.8	NW
3-Dec-21	12:00	1.3	NW
3-Dec-21	13:00	0.9	W
3-Dec-21	14:00	1.3	NW
3-Dec-21	15:00	1.3	WNW
3-Dec-21	16:00	2.2	NW
3-Dec-21	17:00	1.8	WNW
3-Dec-21	18:00	0.4	NW
3-Dec-21	19:00	0.9	NW
3-Dec-21	20:00	1.3	W
3-Dec-21	21:00	1.3	W
3-Dec-21	22:00	1.3	WNW
3-Dec-21	23:00	0.9	SE
4-Dec-21	0:00	0.9	SE
4-Dec-21	1:00	0.9	E
4-Dec-21	2:00	0.9	ESE
4-Dec-21	3:00	0.9	ESE
4-Dec-21	4:00	1.8	E
4-Dec-21	5:00	1.3	ESE
4-Dec-21	6:00	1.3	E
4-Dec-21	7:00	1.3	E
4-Dec-21	8:00	1.3	NNW
4-Dec-21	9:00	1.3	E
4-Dec-21	10:00	1.8	E
4-Dec-21	11:00	1.8	SE
4-Dec-21	12:00	2.7	ESE
4-Dec-21	13:00	1.8	ESE
4-Dec-21	14:00	1.8	ESE
4-Dec-21	15:00	1.8	W
4-Dec-21	16:00	1.8	W
4-Dec-21	17:00	1.8	W
4-Dec-21	18:00	1.3	W
4-Dec-21	19:00	1.3	W
4-Dec-21	20:00	1.3	NNW
4-Dec-21	21:00	1.3	ENE
4-Dec-21	22:00	1.3	NW
4-Dec-21	23:00	1.3	W

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

December 2021			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
5-Dec-21	0:00	0.9	W
5-Dec-21	1:00	0.9	W
5-Dec-21	2:00	0.9	NNW
5-Dec-21	3:00	0.9	NW
5-Dec-21	4:00	0.9	W
5-Dec-21	5:00	1.8	NW
5-Dec-21	6:00	1.3	NW
5-Dec-21	7:00	1.3	W
5-Dec-21	8:00	0.9	NW
5-Dec-21	9:00	1.3	WNW
5-Dec-21	10:00	0.9	NW
5-Dec-21	11:00	0.9	WNW
5-Dec-21	12:00	0.9	NW
5-Dec-21	13:00	0.4	NW
5-Dec-21	14:00	0.9	W
5-Dec-21	15:00	0.9	W
5-Dec-21	16:00	0.4	WNW
5-Dec-21	17:00	0.4	WNW
5-Dec-21	18:00	0.4	WNW
5-Dec-21	19:00	0.9	WNW
5-Dec-21	20:00	0.9	N
5-Dec-21	21:00	1.3	E
5-Dec-21	22:00	1.8	ESE
5-Dec-21	23:00	1.8	E
6-Dec-21	0:00	1.3	ESE
6-Dec-21	1:00	1.8	E
6-Dec-21	2:00	3.1	ESE
6-Dec-21	3:00	3.6	E
6-Dec-21	4:00	2.2	ESE
6-Dec-21	5:00	3.1	E
6-Dec-21	6:00	2.2	E
6-Dec-21	7:00	1.8	ESE
6-Dec-21	8:00	2.2	E
6-Dec-21	9:00	2.7	ESE
6-Dec-21	10:00	1.8	E
6-Dec-21	11:00	1.8	E
6-Dec-21	12:00	2.2	ESE
6-Dec-21	13:00	1.8	ESE
6-Dec-21	14:00	1.3	ESE
6-Dec-21	15:00	0.9	ESE
6-Dec-21	16:00	0.9	ESE
6-Dec-21	17:00	1.3	ESE
6-Dec-21	18:00	0.9	SE
6-Dec-21	19:00	1.3	NNW
6-Dec-21	20:00	1.3	NNW
6-Dec-21	21:00	1.3	WNW
6-Dec-21	22:00	0.9	WNW
6-Dec-21	23:00	0.9	NNW

December 2021			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
7-Dec-21	0:00	0.9	ESE
7-Dec-21	1:00	0.9	ESE
7-Dec-21	2:00	0.9	ESE
7-Dec-21	3:00	1.8	ESE
7-Dec-21	4:00	1.3	SE
7-Dec-21	5:00	1.3	ESE
7-Dec-21	6:00	1.3	ESE
7-Dec-21	7:00	0.9	SE
7-Dec-21	8:00	0.9	ESE
7-Dec-21	9:00	1.3	ESE
7-Dec-21	10:00	1.8	E
7-Dec-21	11:00	1.8	ESE
7-Dec-21	12:00	1.3	E
7-Dec-21	13:00	1.3	WNW
7-Dec-21	14:00	0.9	NW
7-Dec-21	15:00	0.9	SE
7-Dec-21	16:00	0.9	WNW
7-Dec-21	17:00	0.9	W
7-Dec-21	18:00	0.9	WNW
7-Dec-21	19:00	0.9	NNW
7-Dec-21	20:00	0.4	WNW
7-Dec-21	21:00	0.4	NW
7-Dec-21	22:00	0.4	WNW
7-Dec-21	23:00	0.0	SE
8-Dec-21	0:00	0.4	WNW
8-Dec-21	1:00	0.9	WNW
8-Dec-21	2:00	0.9	NW
8-Dec-21	3:00	0.9	W
8-Dec-21	4:00	0.4	WNW
8-Dec-21	5:00	0.9	WNW
8-Dec-21	6:00	0.9	WNW
8-Dec-21	7:00	0.4	WNW
8-Dec-21	8:00	0.4	WNW
8-Dec-21	9:00	0.4	W
8-Dec-21	10:00	0.9	W
8-Dec-21	11:00	1.3	NNW
8-Dec-21	12:00	0.9	NNW
8-Dec-21	13:00	1.8	NNW
8-Dec-21	14:00	3.1	NNW
8-Dec-21	15:00	1.3	NNW
8-Dec-21	16:00	1.3	NNW
8-Dec-21	17:00	1.3	WNW
8-Dec-21	18:00	0.9	NNW
8-Dec-21	19:00	0.9	NNW
8-Dec-21	20:00	0.9	W
8-Dec-21	21:00	0.9	WNW
8-Dec-21	22:00	0.9	WNW
8-Dec-21	23:00	1.8	NW

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

December 2021			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
9-Dec-21	0:00	1.3	W
9-Dec-21	1:00	1.3	SE
9-Dec-21	2:00	0.4	SSE
9-Dec-21	3:00	0.4	SSE
9-Dec-21	4:00	0.0	SSE
9-Dec-21	5:00	0.4	SE
9-Dec-21	6:00	0.9	ESE
9-Dec-21	7:00	0.4	E
9-Dec-21	8:00	0.9	ESE
9-Dec-21	9:00	1.8	ESE
9-Dec-21	10:00	2.2	E
9-Dec-21	11:00	1.8	ESE
9-Dec-21	12:00	1.8	SE
9-Dec-21	13:00	1.8	E
9-Dec-21	14:00	1.3	ESE
9-Dec-21	15:00	1.3	SSE
9-Dec-21	16:00	0.9	SE
9-Dec-21	17:00	0.9	ESE
9-Dec-21	18:00	0.4	WNW
9-Dec-21	19:00	0.9	ESE
9-Dec-21	20:00	1.3	ESE
9-Dec-21	21:00	1.3	ESE
9-Dec-21	22:00	1.8	E
9-Dec-21	23:00	1.3	ESE
10-Dec-21	0:00	1.8	ESE
10-Dec-21	1:00	1.8	ESE
10-Dec-21	2:00	1.8	W
10-Dec-21	3:00	2.2	W
10-Dec-21	4:00	1.8	W
10-Dec-21	5:00	1.8	W
10-Dec-21	6:00	1.3	W
10-Dec-21	7:00	1.8	NNW
10-Dec-21	8:00	1.8	ENE
10-Dec-21	9:00	1.8	NW
10-Dec-21	10:00	1.8	W
10-Dec-21	11:00	1.8	W
10-Dec-21	12:00	1.8	W
10-Dec-21	13:00	3.6	NNW
10-Dec-21	14:00	4.0	NW
10-Dec-21	15:00	4.5	W
10-Dec-21	16:00	3.1	NW
10-Dec-21	17:00	4.0	NW
10-Dec-21	18:00	1.8	W
10-Dec-21	19:00	0.9	NW
10-Dec-21	20:00	0.9	WNW
10-Dec-21	21:00	0.4	NW
10-Dec-21	22:00	0.4	WNW
10-Dec-21	23:00	0.4	NW

December 2021			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
11-Dec-21	0:00	0.9	NW
11-Dec-21	1:00	1.8	W
11-Dec-21	2:00	1.8	W
11-Dec-21	3:00	2.2	WNW
11-Dec-21	4:00	1.8	ESE
11-Dec-21	5:00	1.8	E
11-Dec-21	6:00	1.3	E
11-Dec-21	7:00	1.8	ESE
11-Dec-21	8:00	1.8	SE
11-Dec-21	9:00	1.8	SE
11-Dec-21	10:00	1.8	ESE
11-Dec-21	11:00	1.8	ESE
11-Dec-21	12:00	1.8	NW
11-Dec-21	13:00	3.6	NW
11-Dec-21	14:00	4.0	NW
11-Dec-21	15:00	4.5	NW
11-Dec-21	16:00	3.1	NW
11-Dec-21	17:00	4.0	NW
11-Dec-21	18:00	1.8	NW
11-Dec-21	19:00	0.9	NW
11-Dec-21	20:00	0.9	W
11-Dec-21	21:00	0.4	N
11-Dec-21	22:00	0.4	NW
11-Dec-21	23:00	0.4	WNW
12-Dec-21	0:00	1.3	W
12-Dec-21	1:00	1.3	W
12-Dec-21	2:00	1.3	W
12-Dec-21	3:00	0.9	W
12-Dec-21	4:00	0.9	W
12-Dec-21	5:00	0.9	W
12-Dec-21	6:00	0.9	W
12-Dec-21	7:00	0.9	W
12-Dec-21	8:00	1.8	W
12-Dec-21	9:00	1.3	NNW
12-Dec-21	10:00	1.3	ENE
12-Dec-21	11:00	1.8	NW
12-Dec-21	12:00	1.3	W
12-Dec-21	13:00	1.8	W
12-Dec-21	14:00	1.3	W
12-Dec-21	15:00	0.9	NNW
12-Dec-21	16:00	1.3	NW
12-Dec-21	17:00	0.9	W
12-Dec-21	18:00	0.9	NW
12-Dec-21	19:00	1.3	NW
12-Dec-21	20:00	1.3	W
12-Dec-21	21:00	0.9	NW
12-Dec-21	22:00	1.3	WNW
12-Dec-21	23:00	1.8	NW

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

December 2021			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
13-Dec-21	0:00	1.8	WNW
13-Dec-21	1:00	1.8	NW
13-Dec-21	2:00	1.8	NW
13-Dec-21	3:00	1.3	W
13-Dec-21	4:00	0.9	W
13-Dec-21	5:00	0.9	WNW
13-Dec-21	6:00	0.9	ENE
13-Dec-21	7:00	0.4	NW
13-Dec-21	8:00	0.9	W
13-Dec-21	9:00	1.3	W
13-Dec-21	10:00	1.3	W
13-Dec-21	11:00	1.3	W
13-Dec-21	12:00	1.8	W
13-Dec-21	13:00	1.3	WNW
13-Dec-21	14:00	1.8	NW
13-Dec-21	15:00	2.2	NW
13-Dec-21	16:00	1.3	NW
13-Dec-21	17:00	1.3	NW
13-Dec-21	18:00	1.3	NW
13-Dec-21	19:00	0.9	NW
13-Dec-21	20:00	0.9	NW
13-Dec-21	21:00	0.9	WNW
13-Dec-21	22:00	0.9	WNW
13-Dec-21	23:00	0.9	W
14-Dec-21	0:00	1.8	WNW
14-Dec-21	1:00	1.3	NW
14-Dec-21	2:00	1.3	NW
14-Dec-21	3:00	1.3	NW
14-Dec-21	4:00	1.3	NW
14-Dec-21	5:00	1.8	NW
14-Dec-21	6:00	1.3	NW
14-Dec-21	7:00	0.9	NW
14-Dec-21	8:00	0.9	NW
14-Dec-21	9:00	1.8	NW
14-Dec-21	10:00	1.3	NW
14-Dec-21	11:00	1.8	NW
14-Dec-21	12:00	1.3	W
14-Dec-21	13:00	1.8	W
14-Dec-21	14:00	1.3	W
14-Dec-21	15:00	1.8	NW
14-Dec-21	16:00	4.0	NW
14-Dec-21	17:00	3.6	NW
14-Dec-21	18:00	3.6	NW
14-Dec-21	19:00	1.3	NW
14-Dec-21	20:00	1.3	NW
14-Dec-21	21:00	1.3	NW
14-Dec-21	22:00	0.9	W
14-Dec-21	23:00	1.3	W

December 2021			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
15-Dec-21	0:00	1.8	W
15-Dec-21	1:00	1.3	W
15-Dec-21	2:00	1.3	W
15-Dec-21	3:00	0.9	W
15-Dec-21	4:00	0.9	WNW
15-Dec-21	5:00	0.9	W
15-Dec-21	6:00	0.9	NW
15-Dec-21	7:00	1.3	WNW
15-Dec-21	8:00	1.3	W
15-Dec-21	9:00	1.3	W
15-Dec-21	10:00	1.3	NW
15-Dec-21	11:00	1.3	NW
15-Dec-21	12:00	1.3	NW
15-Dec-21	13:00	0.9	NW
15-Dec-21	14:00	1.3	NW
15-Dec-21	15:00	1.3	W
15-Dec-21	16:00	1.3	NW
15-Dec-21	17:00	0.9	W
15-Dec-21	18:00	0.9	NW
15-Dec-21	19:00	0.9	NW
15-Dec-21	20:00	0.9	NW
15-Dec-21	21:00	0.9	NW
15-Dec-21	22:00	1.8	NW
15-Dec-21	23:00	1.3	NW
16-Dec-21	0:00	1.3	NW
16-Dec-21	1:00	1.8	NW
16-Dec-21	2:00	1.3	NW
16-Dec-21	3:00	0.9	WNW
16-Dec-21	4:00	1.3	NW
16-Dec-21	5:00	0.9	W
16-Dec-21	6:00	1.3	W
16-Dec-21	7:00	1.3	NW
16-Dec-21	8:00	2.2	NW
16-Dec-21	9:00	1.8	NW
16-Dec-21	10:00	1.8	NW
16-Dec-21	11:00	1.8	E
16-Dec-21	12:00	1.3	NW
16-Dec-21	13:00	2.7	NW
16-Dec-21	14:00	1.8	NW
16-Dec-21	15:00	1.8	NW
16-Dec-21	16:00	2.7	NW
16-Dec-21	17:00	1.8	NW
16-Dec-21	18:00	1.8	NW
16-Dec-21	19:00	1.8	NW
16-Dec-21	20:00	1.8	NW
16-Dec-21	21:00	2.2	NW
16-Dec-21	22:00	1.8	NW
16-Dec-21	23:00	0.9	NW



APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

December 2021			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
17-Dec-21	0:00	1.3	NW
17-Dec-21	1:00	0.9	NE
17-Dec-21	2:00	0.4	NNE
17-Dec-21	3:00	0.4	NE
17-Dec-21	4:00	0.4	NW
17-Dec-21	5:00	0.4	N
17-Dec-21	6:00	0.9	NE
17-Dec-21	7:00	0.9	NE
17-Dec-21	8:00	0.9	NE
17-Dec-21	9:00	0.9	NW
17-Dec-21	10:00	0.9	NW
17-Dec-21	11:00	0.9	NW
17-Dec-21	12:00	1.3	NW
17-Dec-21	13:00	2.2	NW
17-Dec-21	14:00	2.2	NW
17-Dec-21	15:00	2.7	NW
17-Dec-21	16:00	4.5	NW
17-Dec-21	17:00	3.1	NW
17-Dec-21	18:00	1.3	NW
17-Dec-21	19:00	1.3	NW
17-Dec-21	20:00	1.3	NW
17-Dec-21	21:00	0.9	NW
17-Dec-21	22:00	0.9	NE
17-Dec-21	23:00	0.9	N
18-Dec-21	0:00	0.9	N
18-Dec-21	1:00	0.9	N
18-Dec-21	2:00	1.8	N
18-Dec-21	3:00	1.3	N
18-Dec-21	4:00	1.3	N
18-Dec-21	5:00	1.3	N
18-Dec-21	6:00	1.3	N
18-Dec-21	7:00	1.3	N
18-Dec-21	8:00	0.9	NNW
18-Dec-21	9:00	0.9	NNW
18-Dec-21	10:00	0.9	NE
18-Dec-21	11:00	0.9	NE
18-Dec-21	12:00	0.9	NW
18-Dec-21	13:00	1.8	NW
18-Dec-21	14:00	1.3	NW
18-Dec-21	15:00	1.3	NW
18-Dec-21	16:00	2.2	NW
18-Dec-21	17:00	1.3	W
18-Dec-21	18:00	1.3	W
18-Dec-21	19:00	1.8	NW
18-Dec-21	20:00	1.3	W
18-Dec-21	21:00	1.3	W
18-Dec-21	22:00	1.3	W
18-Dec-21	23:00	1.3	WNW

December 2021			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
19-Dec-21	0:00	1.3	W
19-Dec-21	1:00	1.3	W
19-Dec-21	2:00	1.3	WNW
19-Dec-21	3:00	0.9	W
19-Dec-21	4:00	0.9	W
19-Dec-21	5:00	0.9	W
19-Dec-21	6:00	0.9	W
19-Dec-21	7:00	0.9	NW
19-Dec-21	8:00	0.9	NW
19-Dec-21	9:00	0.4	W
19-Dec-21	10:00	0.4	W
19-Dec-21	11:00	0.9	NW
19-Dec-21	12:00	1.3	NW
19-Dec-21	13:00	0.9	W
19-Dec-21	14:00	0.9	WSW
19-Dec-21	15:00	0.9	W
19-Dec-21	16:00	0.9	NW
19-Dec-21	17:00	0.9	W
19-Dec-21	18:00	1.8	ESE
19-Dec-21	19:00	1.8	ESE
19-Dec-21	20:00	2.2	E
19-Dec-21	21:00	2.2	E
19-Dec-21	22:00	1.3	ESE
19-Dec-21	23:00	0.9	SE
20-Dec-21	0:00	0.4	SE
20-Dec-21	1:00	1.3	ESE
20-Dec-21	2:00	0.9	ENE
20-Dec-21	3:00	0.9	ESE
20-Dec-21	4:00	1.3	E
20-Dec-21	5:00	0.9	ESE
20-Dec-21	6:00	0.9	ESE
20-Dec-21	7:00	0.9	E
20-Dec-21	8:00	1.3	E
20-Dec-21	9:00	0.9	E
20-Dec-21	10:00	1.8	ESE
20-Dec-21	11:00	1.8	NW
20-Dec-21	12:00	1.8	NW
20-Dec-21	13:00	2.7	NW
20-Dec-21	14:00	3.6	NW
20-Dec-21	15:00	2.7	NW
20-Dec-21	16:00	4.0	NW
20-Dec-21	17:00	2.7	NW
20-Dec-21	18:00	1.3	NW
20-Dec-21	19:00	1.3	W
20-Dec-21	20:00	1.3	W
20-Dec-21	21:00	0.9	W
20-Dec-21	22:00	0.9	WNW
20-Dec-21	23:00	0.9	SE

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

December 2021			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
21-Dec-21	0:00	0.9	ESE
21-Dec-21	1:00	0.9	ESE
21-Dec-21	2:00	1.8	SE
21-Dec-21	3:00	1.3	E
21-Dec-21	4:00	1.3	ESE
21-Dec-21	5:00	1.3	ESE
21-Dec-21	6:00	0.9	ESE
21-Dec-21	7:00	0.9	ESE
21-Dec-21	8:00	0.9	E
21-Dec-21	9:00	0.4	ESE
21-Dec-21	10:00	1.8	NW
21-Dec-21	11:00	1.8	NW
21-Dec-21	12:00	2.2	NW
21-Dec-21	13:00	1.8	NW
21-Dec-21	14:00	2.7	NW
21-Dec-21	15:00	1.8	NW
21-Dec-21	16:00	2.7	NW
21-Dec-21	17:00	0.9	NE
21-Dec-21	18:00	1.8	NW
21-Dec-21	19:00	1.8	NW
21-Dec-21	20:00	0.9	NW
21-Dec-21	21:00	1.8	NW
21-Dec-21	22:00	2.2	NW
21-Dec-21	23:00	1.8	NW
22-Dec-21	0:00	1.3	NW
22-Dec-21	1:00	0.4	NW
22-Dec-21	2:00	0.4	NW
22-Dec-21	3:00	0.9	NW
22-Dec-21	4:00	0.4	WNW
22-Dec-21	5:00	0.4	WNW
22-Dec-21	6:00	0.9	NW
22-Dec-21	7:00	0.4	NW
22-Dec-21	8:00	1.3	NW
22-Dec-21	9:00	0.9	NW
22-Dec-21	10:00	1.8	NW
22-Dec-21	11:00	1.8	NW
22-Dec-21	12:00	1.3	NW
22-Dec-21	13:00	0.9	ESE
22-Dec-21	14:00	0.9	NW
22-Dec-21	15:00	0.9	NW
22-Dec-21	16:00	2.2	NW
22-Dec-21	17:00	1.8	NW
22-Dec-21	18:00	1.3	NW
22-Dec-21	19:00	0.4	NW
22-Dec-21	20:00	0.9	NW
22-Dec-21	21:00	1.3	NNW
22-Dec-21	22:00	1.3	NW
22-Dec-21	23:00	1.3	ESE

December 2021			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
23-Dec-21	0:00	0.9	ESE
23-Dec-21	1:00	0.9	ESE
23-Dec-21	2:00	0.9	ESE
23-Dec-21	3:00	0.9	ESE
23-Dec-21	4:00	0.9	ESE
23-Dec-21	5:00	1.8	NNW
23-Dec-21	6:00	1.3	W
23-Dec-21	7:00	1.3	NW
23-Dec-21	8:00	1.3	NW
23-Dec-21	9:00	1.3	W
23-Dec-21	10:00	1.3	NW
23-Dec-21	11:00	0.9	W
23-Dec-21	12:00	1.3	NW
23-Dec-21	13:00	1.8	NW
23-Dec-21	14:00	1.3	NW
23-Dec-21	15:00	1.3	W
23-Dec-21	16:00	1.3	W
23-Dec-21	17:00	1.3	W
23-Dec-21	18:00	1.3	NW
23-Dec-21	19:00	1.3	W
23-Dec-21	20:00	1.3	NW
23-Dec-21	21:00	0.9	W
23-Dec-21	22:00	0.9	W
23-Dec-21	23:00	1.3	W
24-Dec-21	0:00	1.3	W
24-Dec-21	1:00	0.9	W
24-Dec-21	2:00	0.9	W
24-Dec-21	3:00	0.9	W
24-Dec-21	4:00	1.3	WNW
24-Dec-21	5:00	0.4	W
24-Dec-21	6:00	0.4	W
24-Dec-21	7:00	0.4	W
24-Dec-21	8:00	0.9	WNW
24-Dec-21	9:00	1.3	NW
24-Dec-21	10:00	0.9	W
24-Dec-21	11:00	1.3	W
24-Dec-21	12:00	1.8	NW
24-Dec-21	13:00	3.1	NW
24-Dec-21	14:00	4.9	NW
24-Dec-21	15:00	3.1	NW
24-Dec-21	16:00	3.1	NW
24-Dec-21	17:00	1.8	NW
24-Dec-21	18:00	1.3	NW
24-Dec-21	19:00	1.8	NW
24-Dec-21	20:00	0.9	NE
24-Dec-21	21:00	0.9	NW
24-Dec-21	22:00	1.3	NW
24-Dec-21	23:00	1.3	NW

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

December 2021			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
25-Dec-21	0:00	1.3	NW
25-Dec-21	1:00	1.3	NW
25-Dec-21	2:00	0.9	E
25-Dec-21	3:00	0.9	E
25-Dec-21	4:00	0.9	E
25-Dec-21	5:00	0.9	E
25-Dec-21	6:00	0.9	ESE
25-Dec-21	7:00	1.8	ESE
25-Dec-21	8:00	1.3	ENE
25-Dec-21	9:00	1.3	ENE
25-Dec-21	10:00	1.3	NW
25-Dec-21	11:00	1.3	NW
25-Dec-21	12:00	1.3	NW
25-Dec-21	13:00	1.8	NW
25-Dec-21	14:00	0.9	ESE
25-Dec-21	15:00	1.3	NW
25-Dec-21	16:00	1.3	NNW
25-Dec-21	17:00	1.3	ENE
25-Dec-21	18:00	1.3	ESE
25-Dec-21	19:00	1.8	E
25-Dec-21	20:00	1.8	ESE
25-Dec-21	21:00	2.7	SE
25-Dec-21	22:00	2.2	E
25-Dec-21	23:00	2.2	E
26-Dec-21	0:00	1.8	E
26-Dec-21	1:00	1.3	E
26-Dec-21	2:00	1.3	E
26-Dec-21	3:00	0.9	NW
26-Dec-21	4:00	0.4	WNW
26-Dec-21	5:00	0.9	WNW
26-Dec-21	6:00	0.9	W
26-Dec-21	7:00	0.9	W
26-Dec-21	8:00	0.9	WNW
26-Dec-21	9:00	0.4	ESE
26-Dec-21	10:00	0.4	WNW
26-Dec-21	11:00	0.9	W
26-Dec-21	12:00	0.9	W
26-Dec-21	13:00	0.9	W
26-Dec-21	14:00	1.3	W
26-Dec-21	15:00	0.9	W
26-Dec-21	16:00	0.4	W
26-Dec-21	17:00	0.4	ESE
26-Dec-21	18:00	0.4	ENE
26-Dec-21	19:00	0.9	W
26-Dec-21	20:00	1.3	W
26-Dec-21	21:00	1.3	W
26-Dec-21	22:00	1.3	W
26-Dec-21	23:00	0.9	NW

December 2021			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
27-Dec-21	0:00	1.3	E
27-Dec-21	1:00	1.3	NW
27-Dec-21	2:00	4.9	NW
27-Dec-21	3:00	3.1	NW
27-Dec-21	4:00	3.1	NW
27-Dec-21	5:00	1.3	NW
27-Dec-21	6:00	0.4	W
27-Dec-21	7:00	1.3	NW
27-Dec-21	8:00	0.9	NW
27-Dec-21	9:00	0.9	WNW
27-Dec-21	10:00	0.4	W
27-Dec-21	11:00	0.9	W
27-Dec-21	12:00	0.4	W
27-Dec-21	13:00	0.4	WNW
27-Dec-21	14:00	0.4	W
27-Dec-21	15:00	0.4	WNW
27-Dec-21	16:00	0.4	WNW
27-Dec-21	17:00	0.4	WNW
27-Dec-21	18:00	0.4	WNW
27-Dec-21	19:00	0.4	WNW
27-Dec-21	20:00	0.4	WNW
27-Dec-21	21:00	0.4	NW
27-Dec-21	22:00	0.9	WNW
27-Dec-21	23:00	0.9	WNW
28-Dec-21	0:00	0.4	NW
28-Dec-21	1:00	0.9	NW
28-Dec-21	2:00	0.9	NW
28-Dec-21	3:00	0.4	NW
28-Dec-21	4:00	0.4	NW
28-Dec-21	5:00	1.3	NW
28-Dec-21	6:00	1.3	WNW
28-Dec-21	7:00	1.3	NE
28-Dec-21	8:00	0.9	NE
28-Dec-21	9:00	0.9	NW
28-Dec-21	10:00	0.9	NW
28-Dec-21	11:00	0.9	NW
28-Dec-21	12:00	0.9	NW
28-Dec-21	13:00	1.8	NW
28-Dec-21	14:00	1.3	NE
28-Dec-21	15:00	1.3	NE
28-Dec-21	16:00	0.4	NW
28-Dec-21	17:00	0.0	WNW
28-Dec-21	18:00	0.4	W
28-Dec-21	19:00	0.0	W
28-Dec-21	20:00	0.0	W
28-Dec-21	21:00	0.4	WNW
28-Dec-21	22:00	0.4	W
28-Dec-21	23:00	1.3	WNW

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

December 2021			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
29-Dec-21	0:00	1.3	WNW
29-Dec-21	1:00	0.9	WNW
29-Dec-21	2:00	0.9	WNW
29-Dec-21	3:00	0.9	WNW
29-Dec-21	4:00	1.3	WNW
29-Dec-21	5:00	1.3	NW
29-Dec-21	6:00	0.4	WNW
29-Dec-21	7:00	1.3	WNW
29-Dec-21	8:00	0.9	W
29-Dec-21	9:00	1.8	W
29-Dec-21	10:00	1.3	W
29-Dec-21	11:00	0.9	W
29-Dec-21	12:00	0.9	W
29-Dec-21	13:00	0.4	NW
29-Dec-21	14:00	0.9	NW
29-Dec-21	15:00	1.3	NW
29-Dec-21	16:00	1.3	NW
29-Dec-21	17:00	1.3	NW
29-Dec-21	18:00	0.9	NW
29-Dec-21	19:00	0.0	NW
29-Dec-21	20:00	0.0	NW
29-Dec-21	21:00	0.0	NNW
29-Dec-21	22:00	0.0	NNW
29-Dec-21	23:00	0.4	NW
30-Dec-21	0:00	1.3	NW
30-Dec-21	1:00	2.2	NW
30-Dec-21	2:00	4.0	NW
30-Dec-21	3:00	4.9	NW
30-Dec-21	4:00	4.0	NW
30-Dec-21	5:00	3.1	NW
30-Dec-21	6:00	1.3	NW
30-Dec-21	7:00	1.3	NW
30-Dec-21	8:00	1.3	NW
30-Dec-21	9:00	0.9	NW
30-Dec-21	10:00	0.9	NW
30-Dec-21	11:00	0.9	NW
30-Dec-21	12:00	0.9	NW
30-Dec-21	13:00	0.9	NW
30-Dec-21	14:00	1.8	NW
30-Dec-21	15:00	1.3	WNW
30-Dec-21	16:00	1.3	W
30-Dec-21	17:00	0.9	W
30-Dec-21	18:00	0.9	W
30-Dec-21	19:00	0.9	WNW
30-Dec-21	20:00	1.3	W
30-Dec-21	21:00	1.8	WNW
30-Dec-21	22:00	1.8	WNW
30-Dec-21	23:00	0.9	WNW

December 2021			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
31-Dec-21	0:00	1.3	WNW
31-Dec-21	1:00	2.2	WNW
31-Dec-21	2:00	1.3	WNW
31-Dec-21	3:00	1.8	NW
31-Dec-21	4:00	1.3	WNW
31-Dec-21	5:00	1.3	WNW
31-Dec-21	6:00	1.3	WNW
31-Dec-21	7:00	1.3	WNW
31-Dec-21	8:00	1.3	WNW
31-Dec-21	9:00	0.9	N
31-Dec-21	10:00	0.9	N
31-Dec-21	11:00	0.9	WNW
31-Dec-21	12:00	0.9	WNW
31-Dec-21	13:00	0.9	WNW
31-Dec-21	14:00	1.8	WNW
31-Dec-21	15:00	1.3	WNW
31-Dec-21	16:00	1.3	WNW
31-Dec-21	17:00	0.9	WNW
31-Dec-21	18:00	1.3	WNW
31-Dec-21	19:00	1.3	WNW
31-Dec-21	20:00	1.3	WNW
31-Dec-21	21:00	0.9	NNE
31-Dec-21	22:00	0.9	E
31-Dec-21	23:00	0.4	ENE

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**APPENDIX D  
ENVIRONMENTAL MONITORING  
SCHEDULES**

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**Contract No. KLN/2016/04**  
**Environmental Monitoring Works for Contract No. KL/2015/02**  
**Kai Tak Development –Stage 5A Infrastructure at Former North Apron Area**  
**Impact Air and Noise Monitoring Schedule for December 2021**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1-Dec	2-Dec	3-Dec	4-Dec
			24-hr TSP [AM2(A)]	1-hr TSP x 3 [AM2] Noise [M3(A), M4 & M5(C)]		
<b>5-Dec</b>	6-Dec	7-Dec	8-Dec	9-Dec	10-Dec	11-Dec
		24-hr TSP [AM2(A)]	1-hr TSP x 3 [AM2] Noise [M3(A), M4 & M5(C)]			
<b>12-Dec</b>	13-Dec	14-Dec	15-Dec	16-Dec	17-Dec	18-Dec
	24-hr TSP [AM2(A)]	1-hr TSP x 3 [AM2] Noise [M3(A), M4 & M5(C)]		24-hr TSP [AM2(A)]	1-hr TSP x 3 [AM2]	
<b>19-Dec</b>	20-Dec	21-Dec	22-Dec	23-Dec	24-Dec	<b>25-Dec</b>
			24-hr TSP [AM2(A)]	1-hr TSP x 3 [AM2] Noise [M3(A), M4 & M5(C)]		
<b>26-Dec</b>	<b>27-Dec</b>	28-Dec	29-Dec	30-Dec	31-Dec	
		24-hr TSP [AM2(A)]	1-hr TSP x 3 [AM2] Noise [M3(A), M4 & M5(C)]	24-hr TSP [AM2(A)]	1-hr TSP x 3 [AM2]	

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

\* The noise level limit is 65dB(A) during the exam period

**Air Quality Monitoring Station**

AM2 - Lee Kau Yan Memorial School

AM2(A) - Ng Wah Catholic Secondary School

**Noise Monitoring Station**

M3(A) - The Bridge connecting The Latitude

M4 - Lee Kau Yan Memorial School

M5(C) - Mercy Grace's Home

**Contract No. KLN/2016/04**  
**Environmental Monitoring Works for Contract No. KL/2015/02**  
**Kai Tak Development –Stage 5A Infrastructure at Former North Apron Area**  
**Tentative Impact Air and Noise Monitoring Schedule for January 2022**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						<b>1-Jan</b>
<b>2-Jan</b>	3-Jan	4-Jan	5-Jan	6-Jan	7-Jan	8-Jan
			24-hr TSP [AM2(A)]	1-hr TSP x 3 [AM2]  Noise [M3(A), M4 & M5(C)]		
<b>9-Jan</b>	10-Jan	11-Jan	12-Jan	13-Jan	14-Jan	15-Jan
	24-hr TSP [AM2(A)]	1-hr TSP x 3 [AM2]  Noise [M3(A), M4 & M5(C)]				24-hr TSP [AM2(A)]
<b>16-Jan</b>	17-Jan	18-Jan	19-Jan	20-Jan	21-Jan	22-Jan
	1-hr TSP x 3 [AM2]  Noise [M3(A), M4 & M5(C)]			24-hr TSP [AM2(A)]	1-hr TSP x 3 [AM2]	
<b>23-Jan</b>	24-Jan	25-Jan	26-Jan	27-Jan	28-Jan	29-Jan
			24-hr TSP [AM2(A)]	1-hr TSP x 3 [AM2]  Noise [M3(A), M4 & M5(C)]		
<b>30-Jan</b>	31-Jan					
	24-hr TSP [AM2(A)]					

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

\* The noise level limit is 65dB(A) during the exam period

**Air Quality Monitoring Station**

AM2 - Lee Kau Yan Memorial School  
AM2(A) - Ng Wah Catholic Secondary School

**Noise Monitoring Station**

M3(A) - The Bridge connecting The Latitude  
M4 - Lee Kau Yan Memorial School  
M5(C) - Mercy Grace's Home

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**APPENDIX E  
1-HOUR TSP MONITORING RESULTS  
AND GRAPHICAL PRESENTATION**

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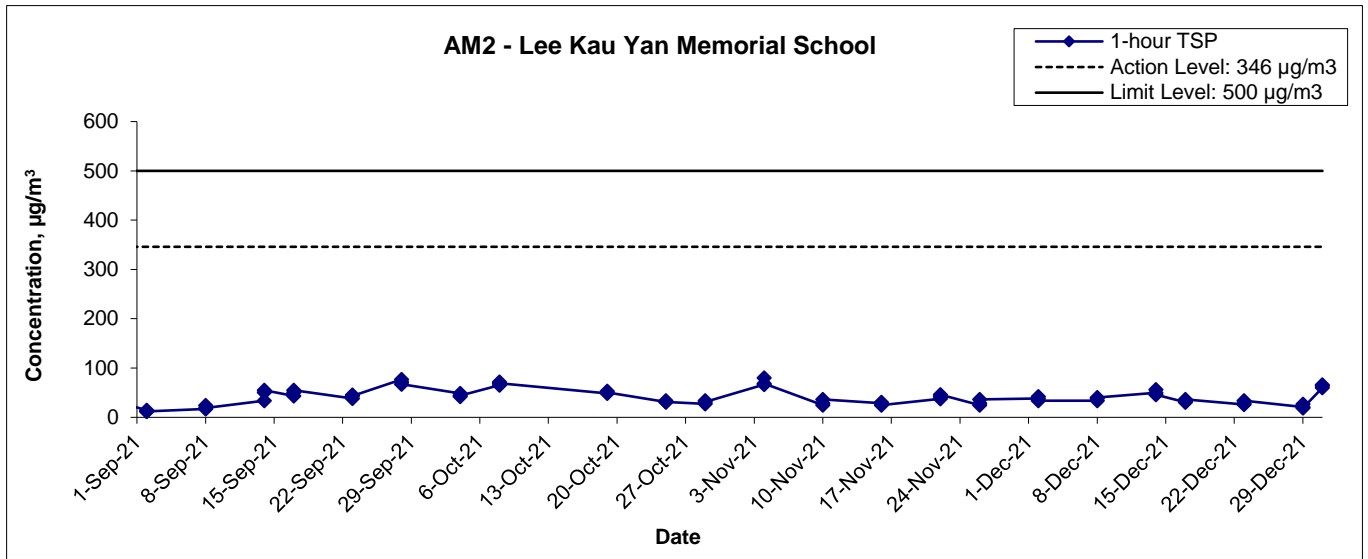
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## Appendix E - 1-hour TSP Monitoring Results

Location AM2 - Lee Kau Yan Memorial School			
Date	Time	Weather	Particulate Concentration ( $\mu\text{g}/\text{m}^3$ )
2-Dec-21	13:00	Sunny	38.0
2-Dec-21	14:00	Sunny	42.0
2-Dec-21	15:00	Sunny	34.0
8-Dec-21	14:00	Fine	34.0
8-Dec-21	15:00	Fine	38.0
8-Dec-21	16:00	Fine	40.0
14-Dec-21	10:00	Sunny	50.0
14-Dec-21	11:00	Sunny	56.0
14-Dec-21	12:00	Sunny	46.0
17-Dec-21	14:00	Fine	30.4
17-Dec-21	15:00	Fine	32.3
17-Dec-21	16:00	Fine	36.1
23-Dec-21	13:30	Sunny	26.0
23-Dec-21	14:30	Sunny	28.0
23-Dec-21	15:30	Sunny	34.0
29-Dec-21	14:00	Sunny	20.9
29-Dec-21	15:00	Sunny	26.6
29-Dec-21	16:00	Sunny	19.0
31-Dec-21	9:00	Sunny	60.0
31-Dec-21	10:00	Sunny	64.0
31-Dec-21	11:00	Sunny	66.0
		Average	39.1
		Maximum	66.0
		Minimum	19.0

### 1-hr TSP Concentration Levels



Title Contract No. KLN/2016/04 Environmental Monitoring Works for Contract No. KL/2015/02 Kai Tak Development –Stage 5A Infrastructure at Former North Apron Area Graphical Presentation of 1-hour TSP Monitoring Results	Scale N.T.S	Project No. MA16043	
	Date Dec 21	Appendix E	

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**APPENDIX F  
24-HOUR TSP MONITORING RESULTS  
AND GRAPHICAL PRESENTATION**

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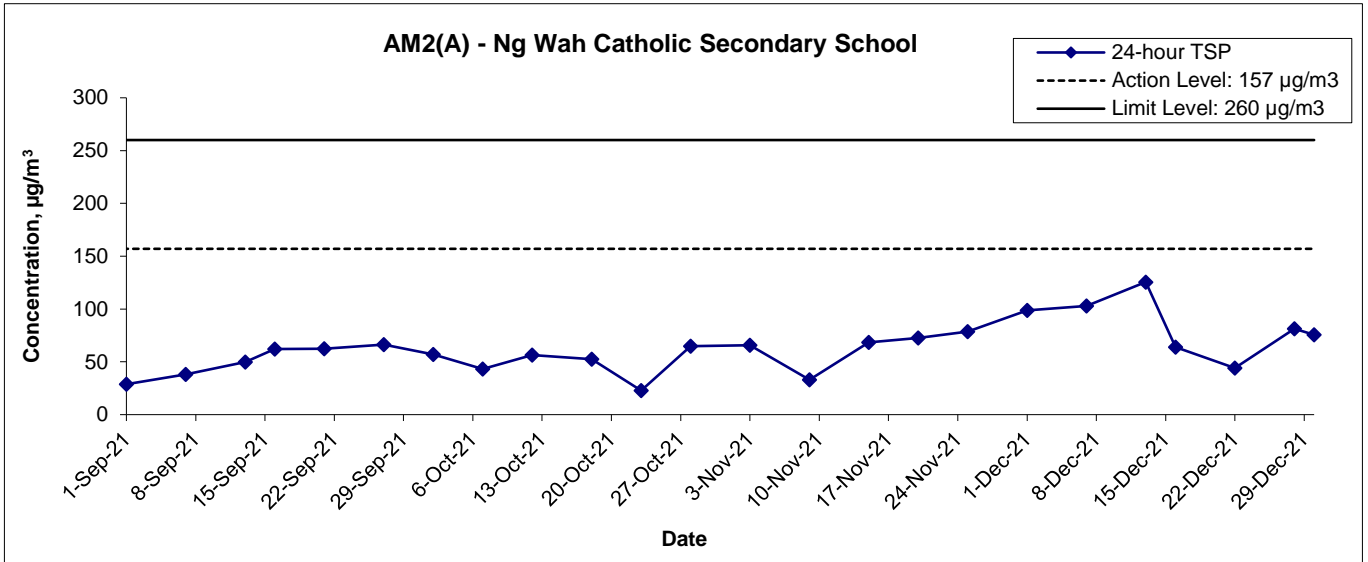
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## Appendix F - 24-hour TSP Monitoring Results

### Location AM2(A) - Ng Wah Catholic Secondary School

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time (hrs.)	Flow Rate (m <sup>3</sup> /min.)		Av. Flow (m3/min)	Total vol. (m3)	Conc. (µg/m3)
				Initial	Final		Initial	Final		Initial	Final			
1-Dec-21	Sunny	290.4	766.5	3.2936	3.4696	0.1760	8356.8	8380.8	24.0	1.24	1.24	1.24	1781.4	98.8
7-Dec-21	Sunny	293.0	766.5	3.3276	3.5102	0.1826	8380.8	8404.8	24.0	1.23	1.23	1.23	1775.7	102.8
13-Dec-21	Sunny	293.0	765.3	3.3709	3.5938	0.2229	8404.8	8428.8	24.0	1.23	1.23	1.23	1775.4	125.6
16-Dec-21	Sunny	295.5	763.3	3.2808	3.3939	0.1131	8428.8	8452.8	24.0	1.23	1.23	1.23	1766.9	64.0
22-Dec-21	Sunny	292.6	762.7	3.3179	3.3961	0.0782	8452.8	8476.8	24.0	1.23	1.23	1.23	1773.2	44.1
28-Dec-21	Sunny	292.6	762.7	3.7139	3.8579	0.1440	8476.8	8500.8	24.0	1.23	1.23	1.23	1772.5	81.3
30-Dec-21	Sunny	289.9	768.1	3.3349	3.4701	0.1352	8500.8	8524.8	24.0	1.24	1.24	1.24	1784.8	75.8
													Min	44.1
													Max	125.6
													Average	84.6

### 24-hr TSP Concentration Levels



Title Contract No. KLN/2016/04 Environmental Monitoring Works for Contract No. KL/2015/02 Kai Tak Development –Stage 5A Infrastructure at Former North Apron Area  Graphical Presentation of 24-hour TSP Monitoring Results	Scale	N.T.S	Project No.	MA16043	CINOTECH
	Date	Dec 21	Appendix	F	

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**APPENDIX G  
NOISE MONITORING RESULTS AND  
GRAPHICAL PRESENTATION**

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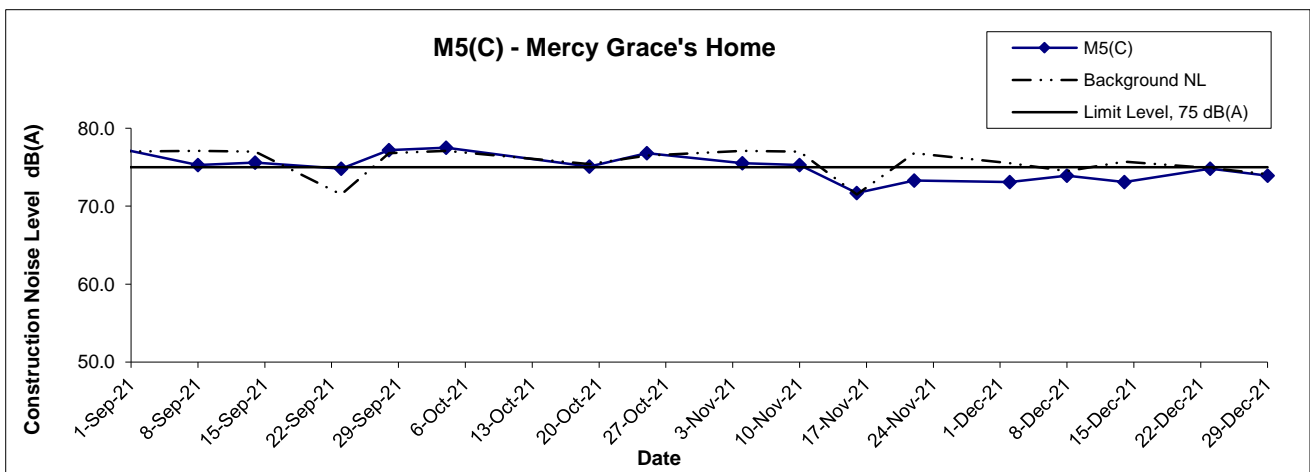
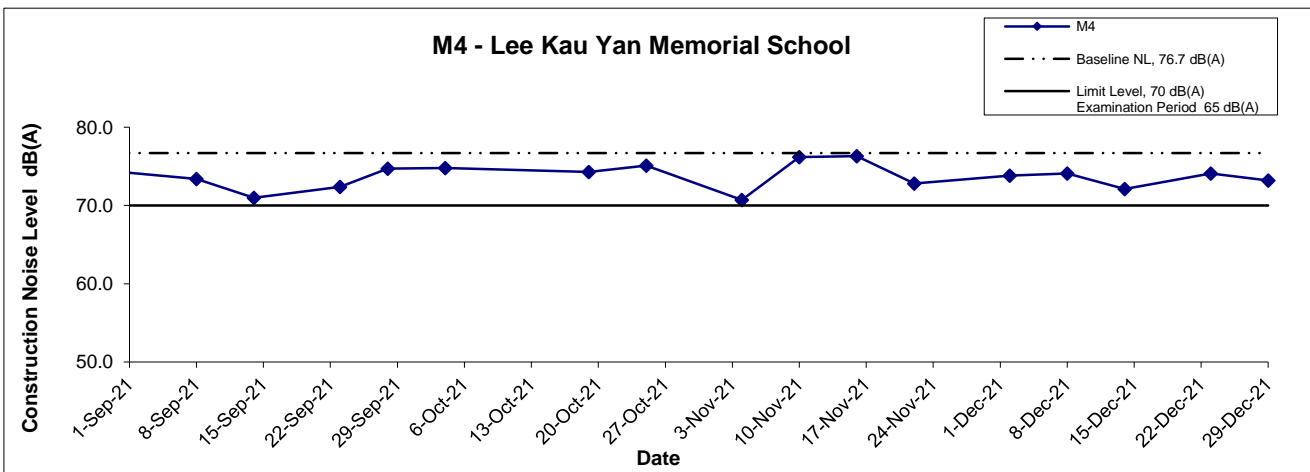
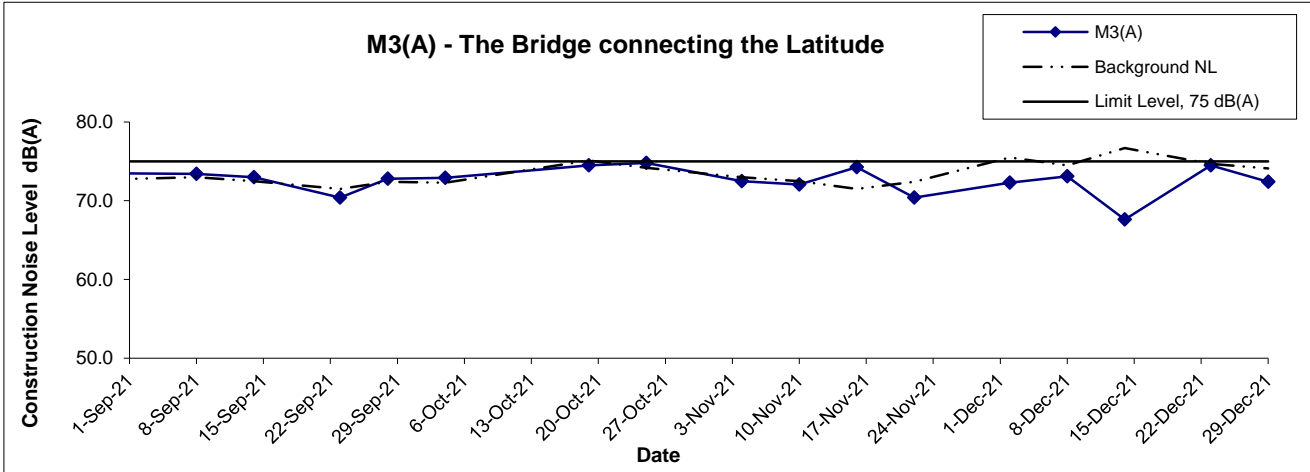
## Appendix G - Noise Monitoring Results

Location M3(A) - The Bridge connecting The Latitude								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Background Noise	Construction Noise Level	
			L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>	L <sub>eq</sub>	L <sub>eq</sub>	
2-Dec-21	13:00	Sunny	72.3	75.5	69.1	75.5	72.3	Measured ≤ Background
8-Dec-21	11:30	Sunny	73.1	76.4	70.2	74.5	73.1	Measured ≤ Background
14-Dec-21	10:40	Sunny	67.6	70.5	65.7	76.7	67.6	Measured ≤ Background
23-Dec-21	11:30	Sunny	74.5	76.9	72.1	74.7	74.5	Measured ≤ Background
29-Dec-21	11:30	Sunny	72.4	75.5	70.1	74.1	72.4	Measured ≤ Background

Location M4 - Lee Kau Yan Memorial School								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Baseline Level	Construction Noise Level	
			L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>	L <sub>eq</sub>	L <sub>eq</sub>	
2-Dec-21	14:00	Sunny	73.8	76.7	70.6	76.7	73.8	Measured ≤ Baseline
8-Dec-21	14:00	Sunny	74.1	76.9	72.0		74.1	Measured ≤ Baseline
14-Dec-21	10:00	Sunny	72.1	74.3	68.4		72.1	Measured ≤ Baseline
23-Dec-21	14:00	Sunny	74.1	75.6	72.1		74.1	Measured ≤ Baseline
29-Dec-21	14:00	Sunny	73.2	76.6	70.1		73.2	Measured ≤ Baseline

Location M5(C) - Mercy Grace's Home								
Date	Time	Weather	Unit: dB (A) (30-min)					
			Measured Noise Level			Background Noise	Construction Noise Level	
			L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>	L <sub>eq</sub>	L <sub>eq</sub>	
2-Dec-21	15:00	Sunny	73.1	76.2	70.2	75.5	73.1	Measured ≤ Background
8-Dec-21	16:00	Sunny	73.9	76.8	70.2	74.5	73.9	Measured ≤ Background
14-Dec-21	15:00	Sunny	73.1	76.5	70.8	75.7	73.1	Measured ≤ Background
23-Dec-21	13:00	Sunny	74.8	76.9	72.4	74.9	74.8	Measured ≤ Background
29-Dec-21	15:00	Sunny	73.9	76.2	71.9	74.1	73.9	Measured ≤ Background

## Noise Levels



Remarks: <sup>[1]</sup> The construction noise levels in the Tables in Appendix G were adopted for plotting the graphs

Title Contract No. KLN/2016/04 Environmental Monitoring Works for Contract No. KL/2015/02 Kai Tak Development – Stage 5A Infrastructure at Former North Apron Area Graphical Presentation of Construction Noise Monitoring Results	Scale N.T.S	Project No. MA16043	
	Date Dec 2021	Appendix G	



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**APPENDIX H**  
**SUMMARY OF EXCEEDANCE**

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## **Appendix H – Summary of Exceedance**

**Exceedance Record for Contract No. KL/2015/02**

**Reporting Month:** December 2021

**(A) Exceedance Record for Air Quality**  
(NIL in the reporting month)

**(B) Exceedance Record for Construction Noise**  
(NIL in the reporting month)

**(C) Exceedance Record for Landscape and Visual**  
(NIL in the reporting month)

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**APPENDIX I  
SITE AUDIT SUMMARY**

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**Contract No. KLN/2016/04**


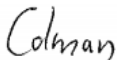
**Environmental Monitoring Works for Contract No. KL/2015/02**

**Kai Tak Development - Stage 5A Infrastructure at Former North Apron Area**

**Weekly Site Inspection Record Summary  
Inspection Information**

Checklist Reference Number	211208
Date	8 December 2021 (Wednesday)
Time	9:30 – 10:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	<b><i>B. Water Quality</i></b>	
	• No environmental deficiency was identified during site inspection.	
	<b><i>C. Air Quality</i></b>	
	• No environmental deficiency was identified during site inspection.	
	<b><i>D. Noise</i></b>	
	• No environmental deficiency was identified during site inspection.	
	<b><i>E. Waste / Chemical Management</i></b>	
	• No environmental deficiency was identified during site inspection	
	<b><i>F. Visual and Landscape</i></b>	
	• No environmental deficiency was identified during site inspection	
	<b><i>G. Permits /Licences</i></b>	
	• No environmental deficiency was identified during site inspection.	
	<b><i>H. Others</i></b>	
	No follow-up items are required from the previous site inspection (ref no.: 211129).	

	Name	Signature	Date
Recorded by	Echo Hung		8 December 2021
Checked by	Colman Wong		9 December 2021

**Contract No. KLN/2016/04**


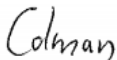
**Environmental Monitoring Works for Contract No. KL/2015/02**

**Kai Tak Development - Stage 5A Infrastructure at Former North Apron Area**

**Weekly Site Inspection Record Summary  
Inspection Information**

Checklist Reference Number	211213
Date	13 December 2021 (Monday)
Time	14:00 – 15:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	<b><i>B. Water Quality</i></b>	
	• No environmental deficiency was identified during site inspection.	
	<b><i>C. Air Quality</i></b>	
	• No environmental deficiency was identified during site inspection.	
	<b><i>D. Noise</i></b>	
	• No environmental deficiency was identified during site inspection.	
	<b><i>E. Waste / Chemical Management</i></b>	
	• No environmental deficiency was identified during site inspection	
	<b><i>F. Visual and Landscape</i></b>	
	• No environmental deficiency was identified during site inspection	
	<b><i>G. Permits /Licences</i></b>	
	• No environmental deficiency was identified during site inspection.	
	<b><i>H. Others</i></b>	
	No follow-up items are required from the previous site inspection (ref no.: 211208).	

	Name	Signature	Date
Recorded by	Echo Hung		13 December 2021
Checked by	Colman Wong		14 December 2021

**Contract No. KLN/2016/04**


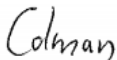
**Environmental Monitoring Works for Contract No. KL/2015/02**

**Kai Tak Development - Stage 5A Infrastructure at Former North Apron Area**

**Weekly Site Inspection Record Summary  
Inspection Information**

Checklist Reference Number	211220
Date	20 December 2021 (Monday)
Time	14:00 – 15:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	<b>B. Water Quality</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>C. Air Quality</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>D. Noise</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>E. Waste / Chemical Management</b>	
	• No environmental deficiency was identified during site inspection	
	<b>F. Visual and Landscape</b>	
	• No environmental deficiency was identified during site inspection	
	<b>G. Permits /Licences</b>	
	• No environmental deficiency was identified during site inspection.	
	<b>H. Others</b>	
	No follow-up items are required from the previous site inspection (ref no.: 211213).	

	Name	Signature	Date
Recorded by	Echo Hung		20 December 2021
Checked by	Colman Wong		21 December 2021

**Contract No. KLN/2016/04**


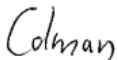
**Environmental Monitoring Works for Contract No. KL/2015/02**

**Kai Tak Development - Stage 5A Infrastructure at Former North Apron Area**

**Weekly Site Inspection Record Summary  
Inspection Information**

Checklist Reference Number	211228
Date	28 December 2021 (Tuesday)
Time	14:00 – 15:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-
Ref. No.	Remarks/Observations	Related Item No.
	<b><i>B. Water Quality</i></b>	
	• No environmental deficiency was identified during site inspection.	
	<b><i>C. Air Quality</i></b>	
	• No environmental deficiency was identified during site inspection.	
	<b><i>D. Noise</i></b>	
	• No environmental deficiency was identified during site inspection.	
	<b><i>E. Waste / Chemical Management</i></b>	
	• No environmental deficiency was identified during site inspection	
	<b><i>F. Visual and Landscape</i></b>	
	• No environmental deficiency was identified during site inspection	
	<b><i>G. Permits /Licences</i></b>	
	• No environmental deficiency was identified during site inspection.	
	<b><i>H. Others</i></b>	
	No follow-up items are required from the previous site inspection (ref no.: 211220).	

	Name	Signature	Date
Recorded by	Echo Hung		28 December 2021
Checked by	Colman Wong		29 December 2021

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**APPENDIX J**  
**EVENT ACTION PLANS**

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## Appendix J - Event Action Plans

### Event/Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	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 Contactor, IEC and 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 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 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 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 ER and IEC within three working days 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, ER, and EPD;</li> <li>3. Repeat measurement to confirm finding;</li> <li>4. Assess effectiveness of Contractor's remedial actions and keep</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> </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 proposals for remedial actions to ER and IEC within three</li> </ol>

## Appendix J - Event Action Plans

	EPD, IEC and ER informed of the results.	4. Advise the ER on the effectiveness of the proposed remedial measures.	implemented; 4. Supervise implementation of remedial measures; 5. Conduct meeting with ET and IEC if exceedance continues.	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, 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, ER and Contractor to discuss the remedial actions to be taken;</li> <li>6. Assess effectiveness of Contractor's remedial actions and keep EPD, IEC and ER informed of the results;</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 amongst 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 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, ER and IEC on proper remedial actions;</li> <li>3. Submit proposals for remedial actions to 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 ER until the exceedance is abated.</li> </ol>

## Appendix J - Event Action Plans

### Event/Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level being exceeded	<ol style="list-style-type: none"> <li>1. Notify ER, IEC and Contractor;</li> <li>2. Carry out investigation;</li> <li>3. Report the results of investigation to the IEC, 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 by the Contractor and advise the ER accordingly;</li> <li>3. Advise the ER on the effectiveness of 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 proposals to IEC and 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, ER, Contractor and EPD;</li> <li>2. Repeat measurements to confirm findings;</li> <li>3. Increase monitoring frequency;</li> <li>4. Identify source and investigate the cause of exceedance;</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial</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 ER within 3 working days of notification;</li> <li>3. Implement the agreed proposals;</li> </ol>

## Appendix J - Event Action Plans

	<p>5. Carry out analysis of Contractor's working procedures;</p> <p>6. Discuss with the IEC, Contractor and ER on remedial measures required;</p> <p>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;</p> <p>8. If exceedance stops, cease additional monitoring.</p> <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>	<p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>	<p>measures to be implemented;</p> <p>4. Supervise the implementation of remedial measures;</p> <p>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.</p> <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>	<p>4. Submit further proposal if problem still not under control;</p> <p>5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated.</p> <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>
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## Appendix J - Event Action Plans

### Event/Action Plan for Landscape and Visual

EVENT ACTION LEVEL	ACTION			
	ET	IEC	ER	CONTRACTOR
Design Check	1. Check final design conforms to the requirements of EP and prepare report.	1. Check report. 2. Recommend remedial design if necessary	1. Undertake remedial design if necessary	
Non-conformity on one occasion	1. Identify Source 2. Inform IEC and ER 3. Discuss remedial actions with IEC, ER and Contractor 4. Monitor remedial actions until rectification has been completed	1. Check report 2. Check Contractor's working method 3. Discuss with ET and Contractor on possible remedial measures 4. Advise ER on effectiveness of proposed remedial measures. 5. Check implementation of remedial measures.	1. Notify Contractor 2. Ensure remedial measures are properly implemented	1. Amend working methods 2. Rectify damage and undertake any necessary replacement
Repeated Non-conformity	1. Identify Source Inform IEC and	1. Check monitoring report	1. Notify Contractor 2. Ensure remedial measures are properly	1. Amend working methods 2. Rectify damage and

## Appendix J - Event Action Plans

	<p>ER</p> <p>2. Increase monitoring frequency</p> <p>3. Discuss remedial actions with IEC, ER and Contractor</p> <p>4. Monitor remedial actions until rectification has been completed</p> <p>5. If non-conformity stops, cease additional monitoring</p>	<p>2. Check Contractor's working method</p> <p>3. Discuss with ET and Contractor on possible remedial measures</p> <p>4. Advise ER on effectiveness of proposed remedial measures</p> <p>5. Supervise implementation of remedial measures.</p>	<p>implemented</p>	<p>undertake any necessary replacement</p>
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**APPENDIX K  
ENVIRONMENTAL MITIGATION  
IMPLEMENTATION SCHEDULE (EMIS)**

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## Appendix K – Summary of Implementation Schedule of Mitigation Measures for Construction Phase

EIA Ref.	Recommended Mitigation Measures	Implementation Status
<b><i>Construction Air Quality</i></b>		
S6.5	8 times daily watering of the work site with active dust emitting activities.	^
S6.8	<p>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.</p> <ul style="list-style-type: none"> <li>• Stockpiling site(s) should be lined with impermeable sheeting and banded. Stockpiles should be fully covered by impermeable sheeting to reduce dust emission.</li> <li>• 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.</li> <li>• 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.</li> <li>• The tarpaulin should be properly secured and should extend at least 300 mm over the edges of the sides and tailboards. The material should also be dampened if necessary before transportation.</li> <li>• The vehicles should be restricted to maximum speed of 10 km per hour and confined haulage and delivery vehicle to designated roadways inside the site. Onsite unpaved roads should be compacted and kept free of loose materials.</li> <li>• Vehicle washing facilities should be provided at every vehicle exit point.</li> <li>• 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 hardcore.</li> <li>• Every main haul road should be sealed with concrete and kept clear of dusty materials or sprayed with water so as to maintain the entire road surface wet.</li> <li>• 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.</li> <li>• Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites.</li> </ul>	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>



## Appendix K – Summary of Implementation Schedule of Mitigation Measures for Construction Phase

S6.8	<ul style="list-style-type: none"> <li>• <u>DWFI compound for JVBC:</u> A DWFI compound is proposed at the downstream of JVC to contain pollution in drainage systems entering the KTAC and KTTS by interception facilities until the ultimate removal of the pollution sources. Tidal barriers and desilting facilities will form part of the compounds to prevent any accumulation of sediment within the downstream section of JVBC and hence fully mitigate the potential odour emissions from the headspace of JVBC near the existing discharge locations. The odour generating operations within the proposed desilting compound will be fully enclosed and the odorous air will be collected and treated by high efficiency deodorizers before discharge to the atmosphere.</li> <li>• <u>Desilting compound for KTN:</u> Two desilting compounds are proposed for KTN (at Site 1D6 and Site 1P1) to contain pollution in drainage systems entering the KTAC and KTTS by interception facilities until the ultimate removal of the pollution sources. Tidal barriers and desilting facilities will form part of the compounds to prevent any accumulation of sediment within the downstream section of KTN and hence fully mitigate the potential odour emissions from the headspace of KTN near the existing discharge locations. The odour generating operations within the proposed desilting compound will be fully enclosed and the odorous air will be collected and treated by high efficiency deodorizers before discharge to the atmosphere.</li> <li>• <u>Decking or reconstruction of KTN within apron area:</u> It is proposed to deck the KTN or reconstruct the KTN within the former Apron area into Kai Tak River from the south of Road D1 to the north of Road D2 along the existing alignment of KTN. The Kai Tak River will compose of a number of channels flowing with nonodorous fresh water and THEES effluent. The channel flowing with THEES effluent will be designed with the width of water surface of not more than 16m.</li> <li>• <u>Localised maintenance dredging:</u> Localised maintenance dredging should be conducted to provide water depth of not less than 3.5m over the whole of KTAC and KTTS. With reference to the water depth data recorded during the odour survey, only some of the areas in the northern part of KTAC (i.e. to the north of taxiway bridge) including the area near the northern edge of KTAC, the area near western bank of KTAC, and the area near the JVC discharge have water depths shallower than 3.5m. The area involved would be about 40% of the northern KTAC and the dredging depth required would be from about 2.7m to less than 1m. The maintenance dredging to be carried out prior to the occupation of any new development in the immediate vicinity of KTAC to avoid potential localized odour impacts at the future ASRs during the maintenance</li> </ul>	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>
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## Appendix K – Summary of Implementation Schedule of Mitigation Measures for Construction Phase

	<p>dredging operation.</p> <ul style="list-style-type: none"> <li>• <u>Improvement of water circulation in KTAC and KTTS:</u> 600m gap opening at the northern part of the former Kai Tak runway, the water circulation in KTAC and KTTS would be substantially improved. Together with the improvement in water circulation, the DO level in KTAC and KTTS would also be increased.</li> <li>• <u>In-situ sediment treatment by bioremediation:</u> Bioremediation would be applied to the entire KTAC and KTTS.</li> </ul>	N/A
<b>Construction Noise</b>		
S7.8	Use of quiet PME, movable barriers barrier for Asphalt Paver, Breaker, Excavator and Hand-held breaker and full enclosure for Air Compressor, Bar Bender, Concrete Pump, Generator and Water Pump.	^
S7.9	<p>Good Site Practice:</p> <ul style="list-style-type: none"> <li>• Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.</li> <li>• Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program.</li> <li>• Mobile plant, if any, should be sited as far away from NSRs as possible.</li> <li>• 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.</li> <li>• 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.</li> <li>• Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.</li> </ul>	^ ^ ^ ^ ^ ^
S7.9	Scheduling of Construction Works during School Examination Period	^
S7.8	(i) Provision of low noise surfacing in a section of Road L2; and	N/A
	(ii) Provision of structural fins	N/A
S7.8	(i) Avoid the sensitive façade of class room facing Road L2 and L4; and	N/A
	(ii) Provision of low noise surfacing in a section of Road L2 & L4	N/A

## Appendix K – Summary of Implementation Schedule of Mitigation Measures for Construction Phase

S7.8	(i) Provision of low noise surfacing in a section of Road L4 before occupation of Site 111; and (ii) Setback of building about 5m from site boundary.	N/A N/A
S7.8	Setback of building about 35m to the northwest direction at 1L3 and 5m at Site 1L2.	N/A
S7.8	(i) avoid any sensitive façades with openable window facing the existing Kowloon City Road network; and Avoid the sensitive façade of class room facing Road L2 and L4; and (ii) for the sensitive facades facing the To Kwa Wan direction, either setback the facades by about 5m to the northeast direction or do not provide the facades with openable window.	N/A N/A
S7.8	(i) avoid any sensitive facades with openable window facing the existing To Kwa Wan Road or (ii) provision of 17.5m high noise tolerant building fronting To Kwa Wan Road and restrict the height of the residential block(s) located at less than 55m away from To Kwa Wan Road to no more than 25m above ground	N/A N/A
S7.8	(i) avoid any sensitive facades with openable window facing the slip road connecting Prince Edward Road East and San Po Kong or other alternative mitigation measures and at-source mitigation measures for the surrounding new local roads to minimise the potential traffic noise impacts from the slip road	^
S7.8	All the ventilation fans installed in the below will be provided with silencers or acoustics treatment. (i) SPS (ii) ESS (iii) Tunnel Ventilation Shaft (iv) EFTS depot	N/A N/A N/A N/A
S7.8	Installation of retractable roof or other equivalent measures	N/A
<b><i>Construction Water Quality</i></b>		
S8.8	The following mitigation measures are proposed to be incorporated in the design of the SPS at KTD, including: <ul style="list-style-type: none"> <li>• Dual power supply or emergency generator should be provided at all the SPSs to secure electrical power supply;</li> <li>• Standby pumps should be provided at all SPSs to ensure smooth operation of the SPS during maintenance of the duty pumps;</li> <li>• An alarm should be installed to signal emergency high water level in the wet well at all SPSs; and</li> <li>• For all unmanned SPSs, a remote monitor system connecting SPSs with the control station through telemetry system should be provided so that swift actions could be taken in case of malfunction of unmanned facilities</li> </ul>	N/A N/A N/A N/A

## Appendix K – Summary of Implementation Schedule of Mitigation Measures for Construction Phase

S8.8	<p><b>Construction Phase</b></p> <p><u>Marine-based Construction</u></p> <p><i>Capital and Maintenance Dredging for Cruise Terminal</i></p> <p>Mitigation measures for construction of the proposed cruise terminal should follow those recommended in the approved EIA for CT Dredging.</p>	N/A
S8.8	<p><i>Fireboat Berth, Runway Opening and Road T2</i></p> <p>Silt curtains should be deployed around the close grab dredger to minimize release of sediment and other contaminants for any dredging and filling activities in open water.</p>	N/A
S8.8	<p>Dredging at and near the seawall area for construction of the public landing steps cum fireboat berth should be carried out at a maximum production rate of 1,000m<sup>3</sup> per day using one grab dredger.</p>	N/A
S8.8	<p>The proposed construction method for runway opening should adopt an approach where the existing seawall at the runway will not be removed until completion of all excavation and dredging works for demolition of the runway. Thus, excavation of bulk fill and majority of the dredging works will be carried out behind the existing seawall, and the sediment plume can be effectively contained within the works area. As there is likely some accumulation of sediments alongside the runway, there will be a need to dredge the existing seabed after completion of all the demolition works. Dredging alongside the 600m opening should be carried out at a maximum production rate of 2,000m<sup>3</sup> per day using one grab dredger.</p>	N/A
8.8	<p>Dredging for Road T2 should be conducted at a maximum rate of 8,000m<sup>3</sup> per day (using four grab dredgers) whereas the sand filling should be conducted at a maximum rate of 2,000m<sup>3</sup> per day (using two grab dredgers).</p>	N/A
8.8	<p>Silt screens shall be applied to seawater intakes at WSD seawater intake.</p>	N/A

## Appendix K – Summary of Implementation Schedule of Mitigation Measures for Construction Phase

S8.8	<p><u>Land-based Construction</u></p> <p><i>Construction Runoff</i></p> <p>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:</p> <ul style="list-style-type: none"> <li>• use of sediment traps</li> <li>• adequate maintenance of drainage systems to prevent flooding and overflow</li> </ul>	<p style="text-align: center;">^</p> <p style="text-align: center;">^</p>
S8.8	<p>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.</p>	<p style="text-align: center;">^</p>
S8.8	<p>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.</p>	<p style="text-align: center;">^</p>
S8.8	<p>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 and particularly suited to applications where the influent is pumped.</p>	<p style="text-align: center;">^</p>
S8.8	<p>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.</p>	<p style="text-align: center;">^</p>
S8.8	<p>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.</p>	<p style="text-align: center;">^</p>
S8.8	<p>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 summarized in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty</p>	<p style="text-align: center;">^</p>

## Appendix K – Summary of Implementation Schedule of Mitigation Measures for Construction Phase

	surface runoff during storm events.	
S8.8	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.	N/A(1)
S8.8	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.	^
S8.8	<i>Drainage</i>  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	^
S8.8	All temporary and permanent drainage pipes and culverts provided 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.	^
S8.8	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.	^
S8.8	<i>Sewage Effluent</i>  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.	^

## Appendix K – Summary of Implementation Schedule of Mitigation Measures for Construction Phase

S8.8	<i>Stormwater Discharges</i>  Minimum distances of 100 m should be maintained between the existing or planned stormwater discharges and the existing or planned seawater intakes	^
S8.8	<i>Debris and Litter</i>  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 and that disposal of any solid materials, litter or wastes to marine waters does not occur	^
S8.8	<i>Construction Works at or in Close Proximity of Storm Culvert or Seafront</i>  The proposed works should preferably be carried out within the dry season where the flow in the drainage channel /storm culvert/ nullah is low.	^
S8.8	The use of less or smaller construction plants may be specified to reduce the disturbance to the bottom sediment at the drainage channel /storm culvert / nullah.	^
S8.8	Temporary storage of materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction materials should be located well away from any water courses during carrying out of the construction works	^
S8.8	Stockpiling of construction materials and dusty materials should be covered and located away from any water courses.	^
S8.8	Construction debris and spoil should be covered up and/or disposed of as soon as possible to avoid being washed into the nearby water receivers.	^
S8.8	Construction activities, which generate large amount of wastewater, should be carried out in a distance away from the waterfront, where practicable.	^
S8.8	Mitigation measures to control site runoff from entering the nearby water environment should be implemented to minimize water quality impacts.  Surface channels should be provided along the edge of the waterfront within the work sites to intercept the runoff.	^
S8.8	Construction effluent, site run-off and sewage should be properly collected and/or treated.	^
S8.8	Any works site inside the storm water courses should be temporarily isolated, such as by placing of sandbags or silt curtains with lead edge at bottom and properly supported props to prevent adverse impact on the storm water quality.	N/A
S8.8	Silt curtain may be installed around the construction activities at the seafront to minimize the potential impacts due to accidental spillage of construction materials.	N/A
S8.8	Proper shoring may need to be erected in order to prevent soil/mud from slipping into the storm culvert/drainage channel/sea.	N/A

## Appendix K – Summary of Implementation Schedule of Mitigation Measures for Construction Phase

S8.8	Supervisory staff should be assigned to station on site to closely supervise and monitor the works	^
S8.8	Marine water quality monitoring and audit programme shall be implemented for the proposed sediment treatment operation.	N/A
<b><i>Construction Waste Management</i></b>		
S9.5	<p>Good Site Practices</p> <p>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 the dredging activities include:</p> <ul style="list-style-type: none"> <li>• Nomination of an approved person, such as a site manager, be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.</li> <li>• Training of site personnel in proper waste management and chemical waste handling procedures.</li> <li>• Provision of sufficient waste disposal points and regular collection for disposal.</li> <li>• Appropriate measure to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.</li> <li>• A recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites).</li> </ul>	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>
S9.5	<p>Waste Reduction Measures</p> <p>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:</p> <ul style="list-style-type: none"> <li>• Sort C&amp;D waste from demolition of the remaining structures to recover recyclable portions such as metals</li> <li>• 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</li> <li>• 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</li> <li>• Any unused chemicals or those with remaining functional capacity should be recycled</li> <li>• Proper storage and site practices to minimise the potential for damage or contamination of construction materials</li> </ul>	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>



## Appendix K – Summary of Implementation Schedule of Mitigation Measures for Construction Phase

S9.5	<p>Dredged Marine Sediment</p> <p>The basic requirements and procedures for dredged mud disposal are specified under the ETWB TCW No. 34/2002. The management of the dredging, use and disposal of marine mud is monitored by the MFC, while the licensing of marine dumping is required under the Dumping at Sea Ordinance and is the responsibility of the Director of Environmental Protection (DEP)</p>	N/A
S9.5	<p>The dredged marine sediments would be loaded onto barges and transported to the designated disposal sites allocated by the MFC depending on their level of contamination. Sediment classified as Category L would be suitable for Type 1 - Open Sea Disposal. Contaminated sediment would require either Type 1 – Open Sea Disposal (Dedicated Sites), Type 2 - Confined Marine Disposal, or Type 3 – Special Treatment / Disposal and must be dredged and transported with great care in accordance with ETWB TCW No. 34/2002. Subject to the final allocation of the disposal sites by MFC, the dredged contaminated sediment must be effectively isolated from the environment and disposed properly at the designated disposal site</p>	N/A
S9.5	<p>It will be the responsibility of the contractor to satisfy the appropriate authorities that the contamination levels of the marine sediment to be dredged have been analysed and recorded. According to the ETWB TCW No. 34/2002, this will involve the submission of a formal Sediment Quality Report to the DEP, prior to the dredging contract being tendered. The contractor for the dredging works should apply for allocation of marine disposal sites and all necessary permits from relevant authorities for the disposal of dredged sediment. During transportation and disposal of the dredged marine sediments requiring Type 1, Type 2, or Type 3 disposal, the following measures should be taken to minimise potential impacts on water quality:</p> <ul style="list-style-type: none"> <li>• Bottom opening of barges should be fitted with tight fitting seals to prevent leakage of material. Excess material should be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved</li> <li>• Monitoring of the barge loading should be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels should be equipped with automatic selfmonitoring devices as required under the Dumping at Sea Ordinance and as specified by the DEP</li> <li>• Barges or hopper barges should not be filled to a level that would cause the overflow of materials or sediment laden water during loading or transportation</li> </ul>	<p>N/A</p> <p>N/A</p> <p>N/A</p>
S9.5	<p>Construction and Demolition Material</p> <p>Mitigation measures and good site practices should be incorporated into contract document to control potential environmental impact from handling and transportation of C&amp;D material. The mitigation measures include:</p> <ul style="list-style-type: none"> <li>• Where it is unavoidable to have transient stockpiles of C&amp;D material within the Project work site pending collection for disposal, the</li> </ul>	^

## Appendix K – Summary of Implementation Schedule of Mitigation Measures for Construction Phase

	<p>transient stockpiles should be located away from waterfront or storm drains as far as possible</p> <ul style="list-style-type: none"> <li>• Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric</li> <li>• Skip hoist for material transport should be totally enclosed by impervious sheeting</li> <li>• Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site</li> <li>• 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 hardcore</li> <li>• 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</li> <li>• All dusty materials should be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet</li> <li>• The height from which excavated materials are dropped should be controlled to a minimum practical height to limit fugitive dust generation from unloading</li> </ul> <p>When delivering inert C&amp;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&amp;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.</p>	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>
S9.5	<p>Chemical Waste</p> <p>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 <i>Waste Disposal (Chemical Waste) (General) Regulation</i></p>	<p>^</p>

## Appendix K – Summary of Implementation Schedule of Mitigation Measures for Construction Phase

S9.5	<p>General Refuse</p> <p>General refuse should be stored in enclosed bins or compaction units separate from C&amp;D material. A licensed waste collector should be employed by the contractor to remove general refuse from the site, separately from C&amp;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</p>	^
<b><i>Construction Landscape and Visual</i></b>		
S13.9	<p>CM1 All existing trees should be carefully protected during construction.</p> <p>CM2 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.</p> <p>CM3 Control of night-time lighting.</p> <p>CM4 Erection of decorative screen hoarding.</p>	<p>^</p> <p>^</p> <p>N/A(1)</p> <p>^</p>

### Remarks:

^	Compliance of mitigation measure
*	Recommendations were made during site audits but improved/rectified by the Contractor
#	Recommendations were made during site audits but has not yet been improved/rectified by the Contractor
•	Non-compliance but rectified by the Contractor
X	Non-compliance of mitigation measure
N/A	Not Applicable at this stage
N/A(1)	Not observed

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**APPENDIX L  
SUMMARIES OF ENVIRONMENTAL  
COMPLAINT, WARNING, SUMMON  
AND NOTIFICATION OF SUCCESSFUL  
PROSECUTION**

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**Contract No. KLN/2016/04  
 Environmental Monitoring Works for Contract No. KL/2015/02  
 Kai Tak Development – Stage 5A Infrastructure at Former North Apron Area**

**Appendix L – Summary of environmental complaint, warning, summon and notification of successful prosecution**

**Complaint Log**

EPD Complaint Ref No.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
17-34438	Dakota Drive and Olympic Avenue	23 October 2017	The complainant concerned about the dust emission when vehicle running on the dry surface outside Dakota Drive and Olympic Avenue. In addition, vehicles were not clear enough before leaving the construction site.	<p>In accordance with the information gathered in the investigation, construction activities were conducted with proper mitigation measures to minimize the dust impact arise from the construction site to the vicinity of this Project.</p> <p>Regular water spraying was provided to haul roads and unpaved areas within the site areas to reduce the dust impact arise from the construction site to the vicinity of this Project. The Contractor had also ensured vehicles and plants were wheel washed to be cleaned of mud and debris before leaving the construction site area. Therefore, the complaint is considered as non-project related.</p> <p>The following recommendations were made to further enhance the mitigation measures:</p> <ul style="list-style-type: none"> <li>● Where practicable, to provide sheltered area on the top and three sides for stockpiles of dusty materials, or perform frequent water spraying so as to maintain the entire surface wet;</li> <li>● Frequent checking and repair the gaps or broken tarpaulin sheets; and</li> <li>● To provide a hard-surfaced road between any cleaning facility and the public Road</li> </ul>	Closed

**Remarks:** No complaint was received in the reporting month.

**Contract No. KLN/2016/04**  
**Environmental Monitoring Works for Contract No. KL/2015/02**  
**Kai Tak Development – Stage 5A Infrastructure at Former North Apron Area**

**Appendix L – Summary of environmental complaint, warning, summon and notification of successful prosecution**

**Warnings / Summons and Successful Prosecutions received**

<b>Log Ref.</b>	<b>Received Date</b>	<b>Details of Warning / Summons and Successful Prosecutions</b>	<b>Investigation/Mitigation Action</b>	<b>Status</b>
N/A	N/A	N/A	N/A	N/A

**Remarks:** No warning/summon and prosecution was received in the reporting month.

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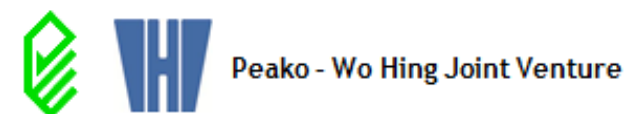
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**APPENDIX M  
SUMMARY OF WASTE GENERATION  
AND DISPOSAL RECORDS**

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Department: CEDD  
 Contract No.: KL/2015/02  
 Project : Kai Tak Development - Stage 5A Infrastructure at Former North Apron Area



**Monthly Summary Waste Flow Table for 2021**

As at 3 January 2022

Month	Quantities of Inert C & D Materials Generated Monthly						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 '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
Jan	0	0	0	0	0	0	0	0	0	0	0.07
Feb	0	0	0	0	0	0	0	0	0	0	0.021
Mar	0	0	0	0	0	0	0	0	0	0	0.014
Apr	1.692	0	0	0	1.692	0	0	0	0	0	0.112
May	0	0	0	0	0	0	0	0	0	0	0.042
June	0	0	0	0	0	0	0	0	0	0	0.084
<b>Sub-total</b>	<b>66.537</b>	<b>0</b>	<b>0</b>	<b>0.406</b>	<b>66.537</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2.569</b>
July	0	0	0	0	0	0	0	0	0	0	0.056
Aug	0	0	0	0	0	0	0	0	0	0	0.014
Sept	0	0	0	0	0	0	0	0	0	0	0.035
Oct	0	0	0	0	0	0	0	0	0	0	0.007
Nov	0	0	0	0	0	0	0	0	0	0	0.021
Dec	0	0	0	0	0	0	0	0	0	0	0.014
<b>Total</b>	<b>66.537</b>	<b>0</b>	<b>0</b>	<b>0.406</b>	<b>66.537</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2.716</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 '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )	
67	0	0	1	67	0	0	0	0	0	2.5	

- Notes:
- (1) The performance targets are given in PS clause 6(14).
  - (2) The waste flow table shall also include C & D materials that are specified in the Contract 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 50,00 m<sup>3</sup>. (PS Clause 25.02A(7) refers).



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**APPENDIX N**  
**CONSTRUCTION PROGRAMME**

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**KL/2015/02  
Construction Programme**

Works	Commence	Finish	2016	2017												2018												2019												2020												2021												2022																																			
			9 10 11 12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12												
Subways Construction	Dec-16	Jun-22		█												█												█												█												█												█																																			
Road Works (D1 and L7)	Feb-19	Jun-21																										█												█																																																											
Landscape	May-21	Aug-21																																																		█												█																																			

# FUGRO TECHNICAL SERVICES LIMITED

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## Appendix C

### Monthly EM&A Report For

Contract No. ED/2018/01

**Kai Tak Development – Stage 4 infrastructure at the former runway and south apron**

**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**

December 2021

(Version 1.0)

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

(Environmental Team Leader)

Ref.: CEDKTDS4EM00\_0\_0206L.22

14 January 2022

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 December 2021**

Reference is made to the Environmental Team's submission of the Monthly EM&A Report for December 2021 (Version 1.0) certified by the ET Leader and provided to us via email on 14 January 2022.

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

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

Yours faithfully,

For and on behalf of

Ramboll Hong Kong Limited



Y H Hui

Independent Environmental Checker

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

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## EXECUTIVE SUMMARY

This is the 24<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 December 2021.

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

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

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

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

### **Complaint log**

5. One water discharge 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
10 December	A sewage discharge	Complaint of muddy water being discharged	<u>Investigation</u> Joint site inspection	5 January 2022

Date of complaint received	Date of complaint	Description of complaint	Investigation / Recommendations / Action take	Close-out date / Status
2021	complaint was referred from the Contractor on 10 December 2021 through E-Mail regarding a complaint received by EPD (ref.: K19/RE/00029046-21) on 9 December 2021.	into the sea of To Kwa Wan Typhoon Shelter via a DSD outfall near the roundabout of Shing Fung Road.	<p>was conducted by ER, IEC, ET and the contractor on 14 December 2021, no adverse observation against the water impact was recorded.</p> <ul style="list-style-type: none"> <li>- There was no muddy water discharge to DSD outfall near the roundabout of Shing Fung Road.</li> <li>- The sand bag with layers and filter were provided at the manholes.</li> </ul> <p><u>Recommendations</u></p> <p>There was no direct evidence showing that the water nuisance was caused by the contractor at the complaint area. Some of muddy water generated from wheel washing might be flow to the outfall inside the site boundary, however the contractor had taken the mitigation measure by using sand bag and filter to ease the nuisance. The contractor is recommended to implement the following measures to minimize the impact for waste water:</p> <ol style="list-style-type: none"> <li>1. Enhance the sand bag with several layers instead of one layer only and replace the filter frequently.</li> <li>2. Modify the wheel</li> </ol>	

Date of complaint received	Date of complaint	Description of complaint	Investigation / Recommendations / Action take	Close-out date / Status
			<p>washing area such that the muddy water will be directly flow to the pit and then waste water treatment facility.</p> <p>3. Take necessary measures to minimize the environmental nuisance arising from the construction site.</p> <p><u>Action taken</u></p> <p>1. Sand bags and filter were used to block the manholes.</p> <p>2. Manholes had been adequately covered and replace the filter frequently.</p>	

**Notifications of summons and successful prosecutions**

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

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

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

Date of receiving notification of summons or prosecutions	Date of event	Description of event	Action take	Close-out date / Status
were received in the reporting month.				

**Report changes**

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

**Key construction works in the reporting month**

8. Major construction activities undertake during the reporting month included:
- North Approach Ramp – Construction of wall, roof slab, utilities trough
  - Bridge D3 – Construction of Bridge Deck and abutments
  - North Depressed Road – Construction of wall & top slab
  - Underpass – Construction of walls and roof slab
  - South Approach Ramp – Construction of Permanent Structure
  - District Cooling System seawater intake box culvert – Installation of precast units and backfilling works, reinstatement of the seawall and backfilling works
  - Lift 3 –Construction of linking platform
  - Lift 4 –Construction of Wall and Roof Slab / Installation of Steelworks and Glass Panel
  - South Depressed Road –Installation of ELS system / construction of permanent works
  - Rising Main and Water Pipe – Laying of sewage
  - Landscaped Deck –Construction of pile caps and installation of columns
  - Transformer Room –Installation of ELS system and construction of permanent structure
  - Road D3 Junction –Road works
  - Lift 1 &2 -Installation of ELS system

**Future key issues**

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

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

Future key issues in the coming month	Potential impact
North Approach Ramp –Construction of utilities trough	Noise and Air Quality, Chemical and Waste Management
Bridge D3 –Construction of Bridge Deck and abutments	Noise and Air Quality, Landscape and Visual
North Depressed Road – Construction of wall & top slab	Noise and Air Quality, Chemical and Waste Management
Underpass – Construction of walls and roof slab	Noise and Air Quality, Chemical and Waste Management
South Approach Ramp – Construction of Permanent Structure	Noise and Air Quality, Chemical and Waste Management
District Cooling System seawater intake box culvert - Installation of precast units and backfilling works, reinstatement of the seawall and backfilling works	Noise, Air and Water Quality
Lift 3 –Construction of linking platform	Noise and Air Quality, Chemical and Waste Management
Lift 4 –Construction of Wall and Roof Slab / Installation of Steelworks and Glass Panel	Noise, Air and Water Quality
South Depressed Road –Installation of ELS system / construction of permanent works	Noise and Air Quality, Chemical and Waste Management
Rising Main and Water Pipe – Laying of sewage	Noise, Air and Water Quality
Landscaped Deck –Construction of pile caps and installation of columns	Noise, Air and Water Quality
Transformer Room – Installation of ELS system and construction of permanent structure	Noise, Air and Water Quality
Road D3 Junction –Road works	Noise, Air and Water Quality
Lift 1 &2- Installation of ELS system	Noise and Air Quality, Chemical and Waste Management

# 1. INTRODUCTION

## **Project Background**

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

## **Project Organization**

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

*Table 1.1 Contact Information of Key Personnel*

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

### **Works Area and Construction Programme**

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

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

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



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

North Approach Ramp – Construction of utilities trough	Bridge D3 – Construction of Bridge Deck and abutments
North Depressed Road – Construction of wall & top slab	Underpass – Construction of walls and roof slab
South Approach Ramp – Construction of Permanent Structure	District Cooling System seawater intake box culvert - Installation of precast units and backfilling works, reinstatement of the seawall and backfilling works
Rising Main and Water Pipe – Laying of sewage	Lift 3 –Construction of linking platform
Lift 4 – Construction of Wall and Roof Slab / Installation of Steelworks and Glass Panel	South Depressed Road – Installation of ELS system / construction of permanent works
Landscaped Deck – Construction of pile caps and installation of columns	Transformer Room – Installation of ELS system and construction of permanent structure
Road D3 Junction – Road works	Lift 1 &2 - Installation of ELS system

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

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

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

EP Condition EP-337/2009	EP Condition EP-445/2013	EP Condition EP-445/2013/A	Submission	Submission Date
Condition 1.11	Condition 1.12	Condition 1.12	Notification of Commencement Date of Construction of the Project	6 Jan 2020
Condition 2.3	Condition 2.3	Condition 2.3	Management Organization of Main Construction Companies	9 Sep 2019
Condition 2.3	Condition 2.3	Condition 2.3	Updated Management Organization of Main Construction Companies	17 Aug 2021
Condition 2.4	Condition 2.4	Condition 2.4	Design Drawings	6 Jan 2020
Condition 2.11	Condition 2.5	Condition 2.5	Landscape Mitigation Plans	13 Nov 2020
Condition 2.1	Condition 2.5	Condition 2.5	Landscape Mitigation Plans (Revision 2)	18 May 2021
Condition 3.2	NA	NA	Baseline Monitoring Report	2 Jan 2020
Condition 3.2	NA	NA	Revised Baseline Monitoring Report	28 Mar 2020

EP Condition EP-337/2009	EP Condition EP-445/2013	EP Condition EP-445/2013/A	Submission	Submission Date
Condition 3.3	Condition 3.2	Condition 3.2	Monthly EM&A Report (November 2021)	13 Dec 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  - 1 hour	- Once every 6 days  - Three times every 6 days
AM4(A) - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop	Rooftop			
AM7 - Hong Kong Children's Hospital	Rooftop			

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

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

### **Monitoring Equipment**

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

*Table 2.3 Air Quality Monitoring Equipment*

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

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

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

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

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

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

2.9 Setup criteria of HVS are shown as follows:

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

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

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

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

2.13 The filter holding frame was removed by loosening the four nuts and a weighted and conditioned filter was carefully centered with the stamped number upwards, on a supporting screen.

2.14 The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts. The applied pressure was sufficient to avoid air leakage at the edges.

2.15 The shelter lid was closed and secured with the aluminium strip.

2.16 The timer was programmed. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).

2.17 After sampling, the filter was removed from the HVS and put into a clean and labeled seal plastic bag to avoid cross contamination. The elapsed time was also be recorded. The sampled filters were sent to the HOKLAS accredited or other internationally accredited laboratory for weighting.

#### Maintenance/Calibration

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

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

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

#### Measurement Procedures

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

- Set up the dust meter on a tripod at 1.2m level.
- Turned on the dust meter and check the battery, if too low, change new ones. Pointed the meter to the source area or the planned measurement area.
- The zero calibration of the instrument was conducted before and after each sampling.
- TSP levels were recorded for 1-hour with 5-minute data logging interval.
- Recorded down the general meteorological conditions, Test ID no., start/end time, spot check reading at each sampling location for data processing.

- Recorded any activities that may generate dust during measurement period.

### Maintenance/Calibration

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

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

### Wind Data Monitoring

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

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

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

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

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

### Action and Limit Levels

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

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

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

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

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

**Impact Air Quality Monitoring results**

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

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

Air Monitoring Station	Average TSP Concentration, $\mu\text{g}/\text{m}^3$	Range, $\mu\text{g}/\text{m}^3$	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AM3	75	26 – 93	182	260
AM4(A)	70	22 – 90	187	260
AM7	80	24 – 109	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	56	21 – 82	297	500
AM4(A)	58	26 – 73	326	500
AM7	65	23 – 96	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	1
Sound Level Calibrator	RION NC 75	1
Air Flowmeter	TSI TA440 Air Velocity	2

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

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

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

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

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

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

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

3.14 Noise level was recorded.

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

**Maintenance and Calibration**

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

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

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

**Action and Limit Levels**

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

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

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

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

**Impact Noise Monitoring results**

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

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

Noise Monitoring Station	Measured $L_{Aeq, 30\text{-min}}$ , Average, dB(A)	Measured $L_{Aeq, 30\text{-min}}$ , Range, dB(A)	Action Level	Limit Level ^
M11	67.8	67.1 – 68.1	When one documented complaint is received	75 dB(A)
M12	65.0	63.8 – 65.9		

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.

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 (December 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	26 – 93
AM4(A) - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop	A43 <sup>^</sup>	123	195	22 – 90
AM7 – Hong Kong Children's Hospital	PA60	NA	NA	24 – 109

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 (December 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>	21 – 82
AM4(A) - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop	A43	283 <sup>^</sup>	409 <sup>^</sup>	26 – 73
AM7 – Hong Kong Children's Hospital	PA60	NA	NA	23 – 96

Note:

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

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

Noise Monitoring Station	NSR No. in EIA report	Predicted Mitigated Construction Noise Levels during Normal Daytime Working Hour L <sub>Aeq, 30min</sub> , dB(A)	Measured Noise Level in Reporting Month (December 2021) L <sub>Aeq, 30min</sub> , dB(A)
M11 - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop	N18	50 – 76*	67.1 – 68.1
M12 - Hong Kong Children's Hospital	PN83, PN84, PN84A	NA	63.8 – 65.9

Note:

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

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

## 5. LANDSCAPE AND VISUAL MONITORING

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

### **Results and Observations**

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

5.3 Site inspections were conducted on 2, 9, 14, 23 and 30 December 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
02 December 2021	No	NA	NA
09 December 2021	No	NA	NA
14 December 2021	No	NA	NA
23 December 2021	No	NA	NA
30 December 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 2, 9, 14, 23 and 30 December 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
02 December 2021	NA	NA	NA
09 December 2021	 <p>Observation: The accumulated waste should be removed</p>	 <p>Action Taken: The accumulated waste was removed.</p>	Closed-out on 14 December 2021
14 December 2021	 <p>Observation: The main haul road near the underpass area (NDR) should be kept water spraying to reduce dust emission.</p>	 <p>Action Taken: Dust suppression has been enforced main haul road to reduce dust nuisance.</p>	Closed-out on 23 December 2021
23	NA	NA	NA



Inspection Date	Key Observations	Recommendations / Actions	Close-out Date / Status
December 2021			
30 December 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-RE0522-21	02 Jun 2021	01 Dec 2021
	GW-RE0528-21	11 Jun 2021	10 Dec 2021
	GW-RE0540-21	12 Jun 2021	11 Dec 2021
	GW-RE0893-21	24 Sep 2021	19 Mar 2022
	GW-RE0960-21	05 Oct 2021	03 Apr 2022
	GW-RE1054-21	27 Oct 2021	13 Apr 2022

Environmental Licenses, Notifications and Permits	Ref. No.	Valid Form	Valid Till
	GW-RE1214-21	06 Dec 2021	01 June 2022
	GW-RE1262-21	30 Dec 2021	11 Jun 2022
	GW-RE1263-21	30 Dec 2021	17 Jun 2022

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

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

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

### **Environmental Complaint and Non-compliance**

6.9 One water discharge 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
10 December 2021	A sewage discharge complaint was referred from the Contractor on 10 December 2021 through E-Mail regarding a complaint received by EPD (ref.: K19/RE/00029046-21) on 9 December 2021.	Complaint of muddy water being discharged into the sea of To Kwa Wan Typhoon Shelter via a DSD outfall near the roundabout of Shing Fung Road.	<u>Investigation</u> Joint site inspection was conducted by ER, IEC, ET and the contractor on 14 December 2021, no adverse observation against the water impact was recorded. - There was no muddy water discharge to DSD outfall near the roundabout of Shing Fung Road. - The sand bag with layers and filter	5 January 2022

Date of complaint received	Date of complaint	Description of complaint	Investigation / Recommendations / Action take	Close-out date / Status
			<p>were provided at the manholes.</p> <p><u>Recommendations</u>  There was no direct evidence showing that the water nuisance was caused by the contractor at the complaint area. Some of muddy water generated from wheel washing might be flow to the outfall inside the site boundary, however the contractor had taken the mitigation measure by using sand bag and filter to ease the nuisance. The contractor is recommended to implement the following measures to minimize the impact for waste water:</p> <ol style="list-style-type: none"> <li>1. Enhance the sand bag with several layers instead of one layer only and replace the filter frequently.</li> <li>2. Modify the wheel washing area such that the muddy water will be directly flow to the pit and then waste water treatment facility.</li> <li>3. Take necessary measures to minimize the environmental nuisance arising from the construction site.</li> </ol>	

Date of complaint received	Date of complaint	Description of complaint	Investigation / Recommendations / Action take	Close-out date / Status
			<u>Action taken</u> 1. Sand bags and filter were used to block the manholes. 2. Manholes had been adequately covered and replace the filter frequently.	

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

**Notifications of summons and successful prosecutions**

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

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

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

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



## 7. FUTURE KEY ISSUES

### Construction Programme in the coming month

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

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

Future key issues in the coming month	Potential impact
North Approach Ramp – Construction of utilities trough	Noise and Air Quality, Chemical and Waste Management
Bridge D3 – Construction of Bridge Deck and abutments	Noise and Air Quality, Landscape and Visual
North Depressed Road – Construction of wall & top slab	Noise and Air Quality, Chemical and Waste Management
Underpass – Construction of walls and roof slab	Noise and Air Quality, Chemical and Waste Management
South Approach Ramp – Construction of Permanent Structure	Noise and Air Quality, Chemical and Waste Management
District Cooling System seawater intake box culvert - Installation of precast units and backfilling works, reinstatement of the seawall and backfilling works	Noise, Air and Water Quality
Lift 3 – Construction of linking platform	Noise and Air Quality, Chemical and Waste Management
Lift 4 – Construction of Wall and Roof Slab / Installation of Steelworks and Glass Panel	Noise, Air and Water Quality
South Depressed Road – Installation of ELS system / construction of permanent works	Noise and Air Quality, Chemical and Waste Management
Rising Main and Water Pipe – Laying of sewage	Noise, Air and Water Quality
Landscaped Deck – Construction of pile caps and installation of columns	Noise, Air and Water Quality
Transformer Room – Installation of ELS system and construction of permanent structure	Noise, Air and Water Quality
Road D3 Junction – Road works	Noise, Air and Water Quality
Lift 1 &2- Installation of ELS system	Noise and Air Quality, Chemical and Waste Management

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 One water discharge complaint was received in the reporting month.
- 8.6 No notification of summons and successful prosecutions was received in the reporting month.



**Figure**

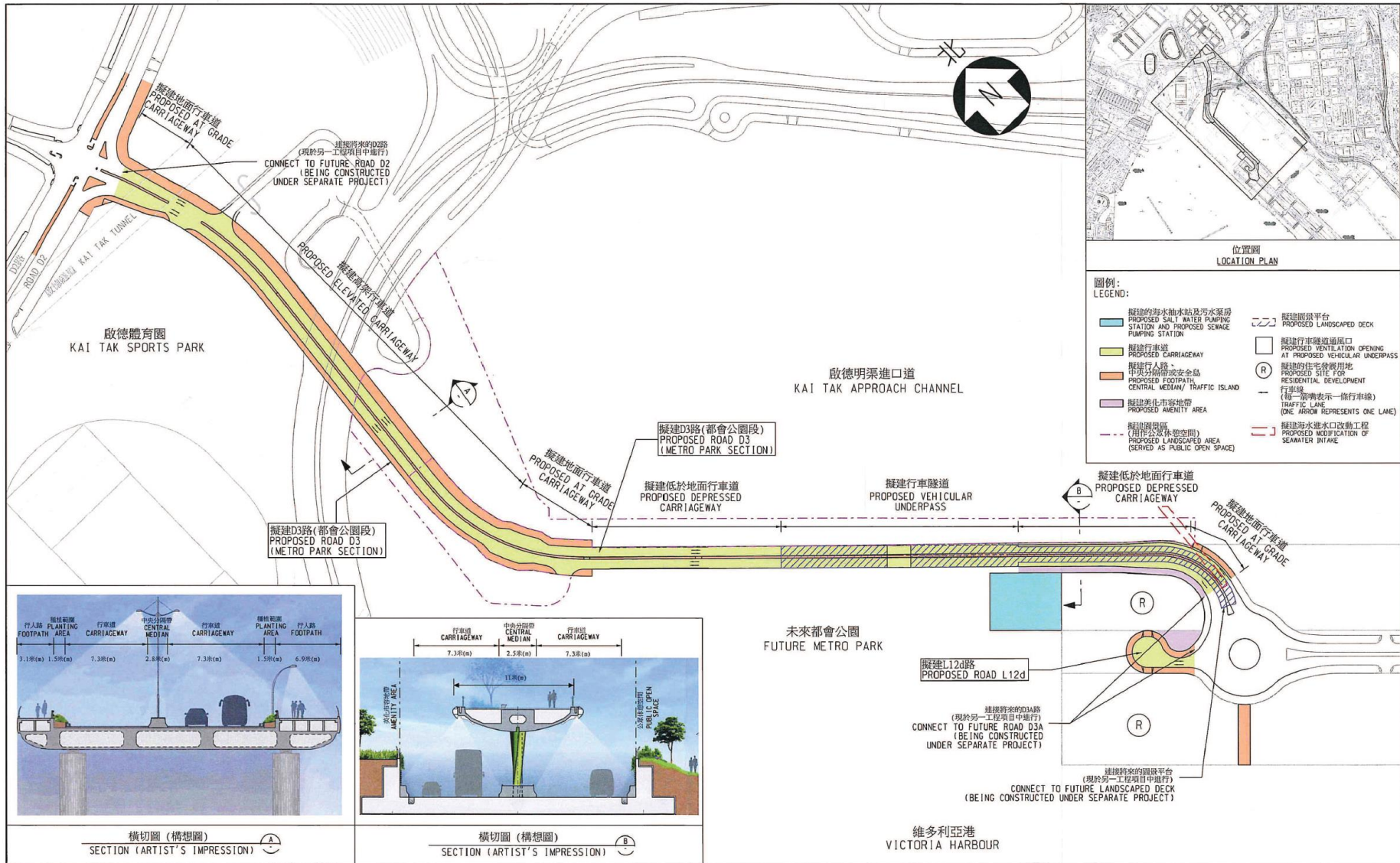


Figure 1 – Proposed works of Contract No. ED/2018/01

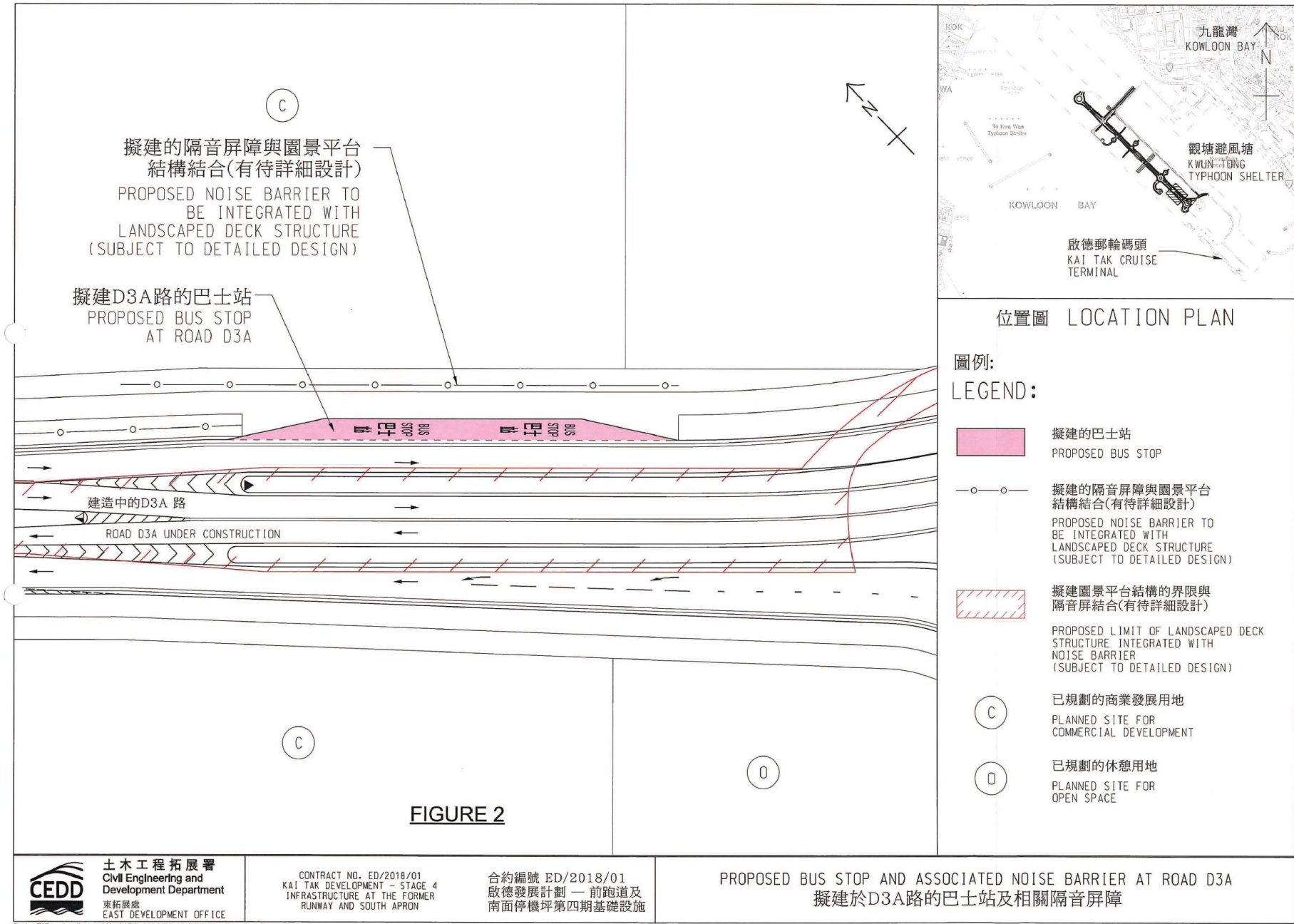


Figure 2 – Proposed Bus Stop And Associated Noise Barrier At Road D3A





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





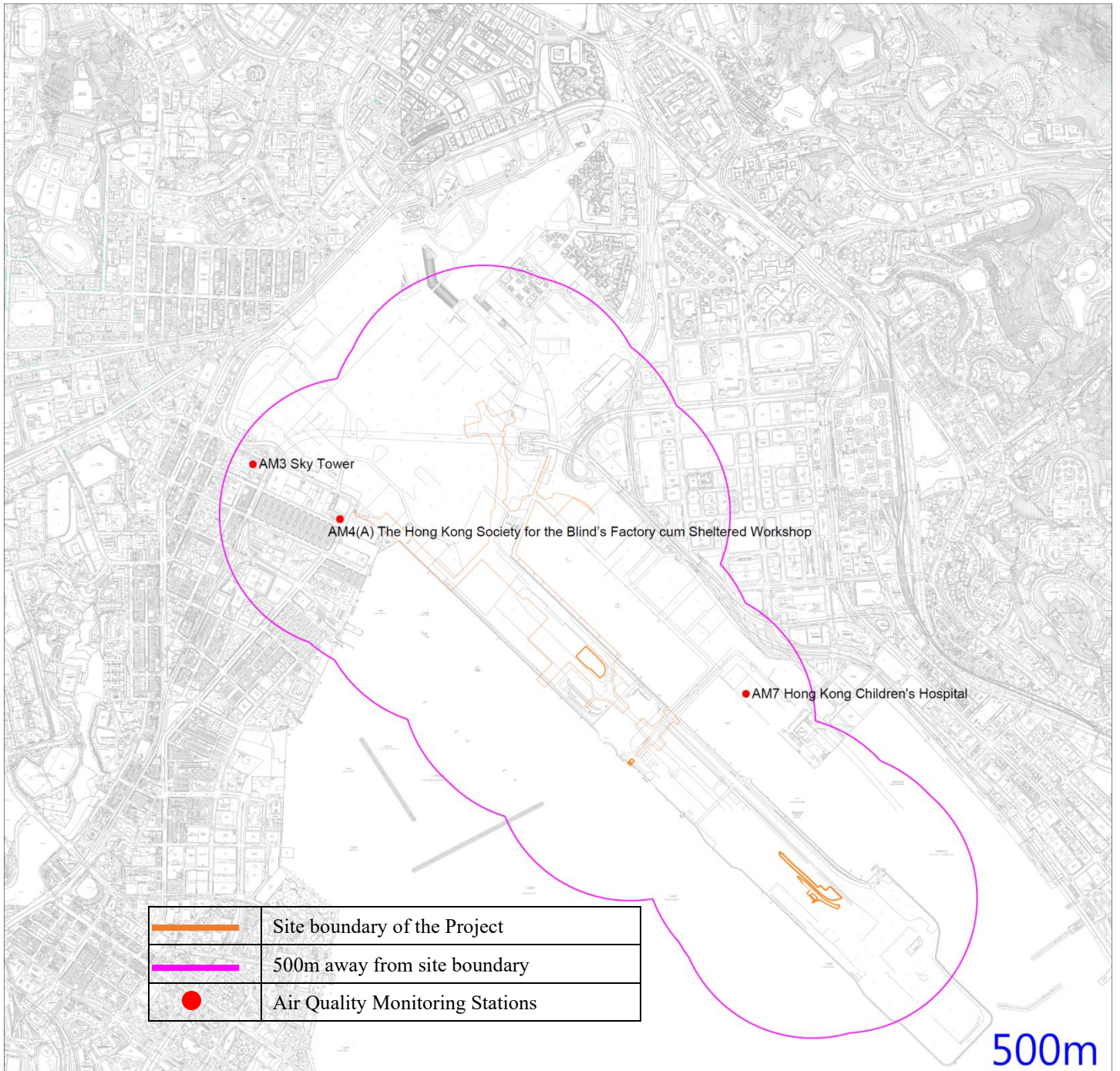


Figure 5 – Air Quality Monitoring Stations



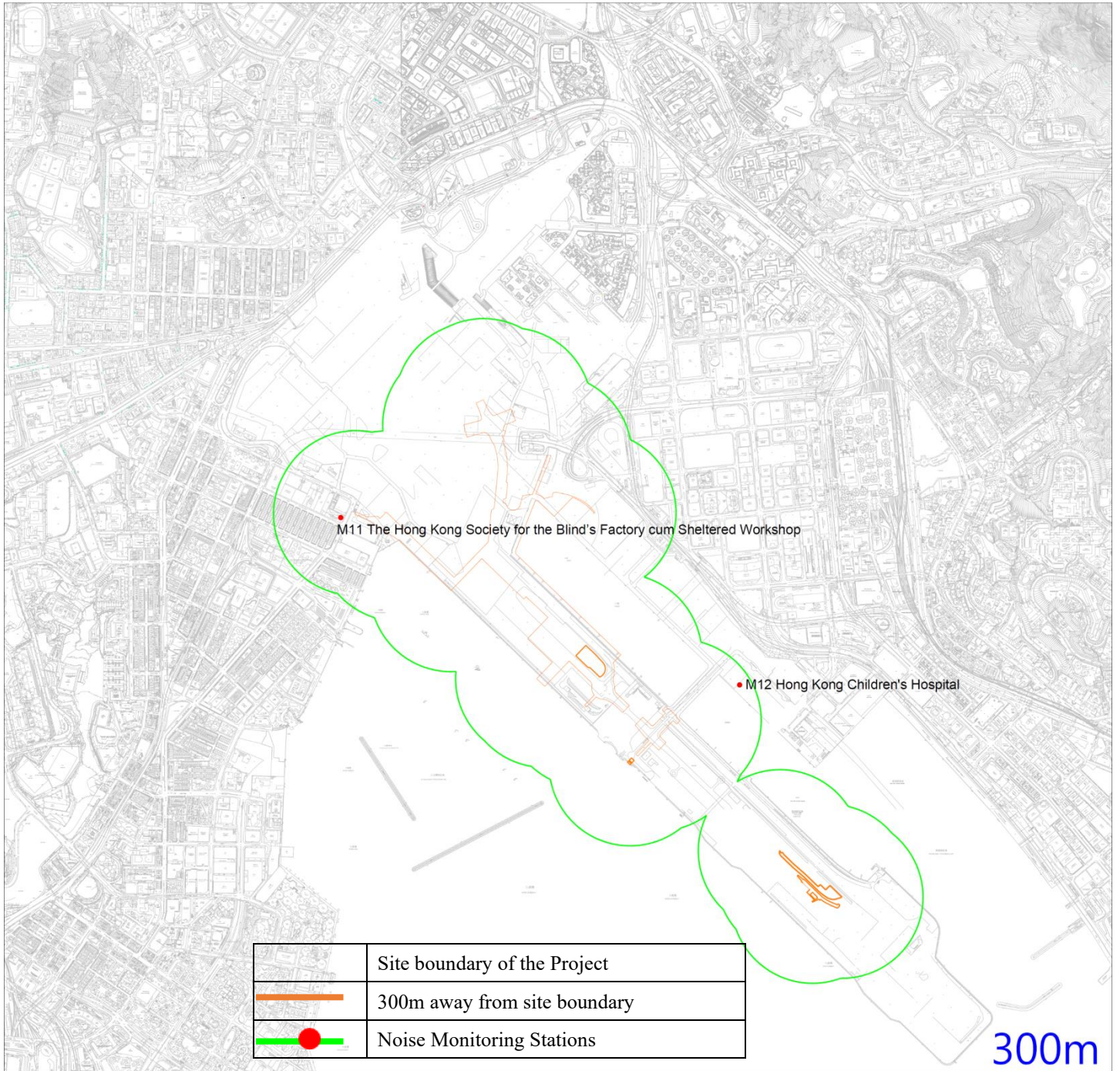
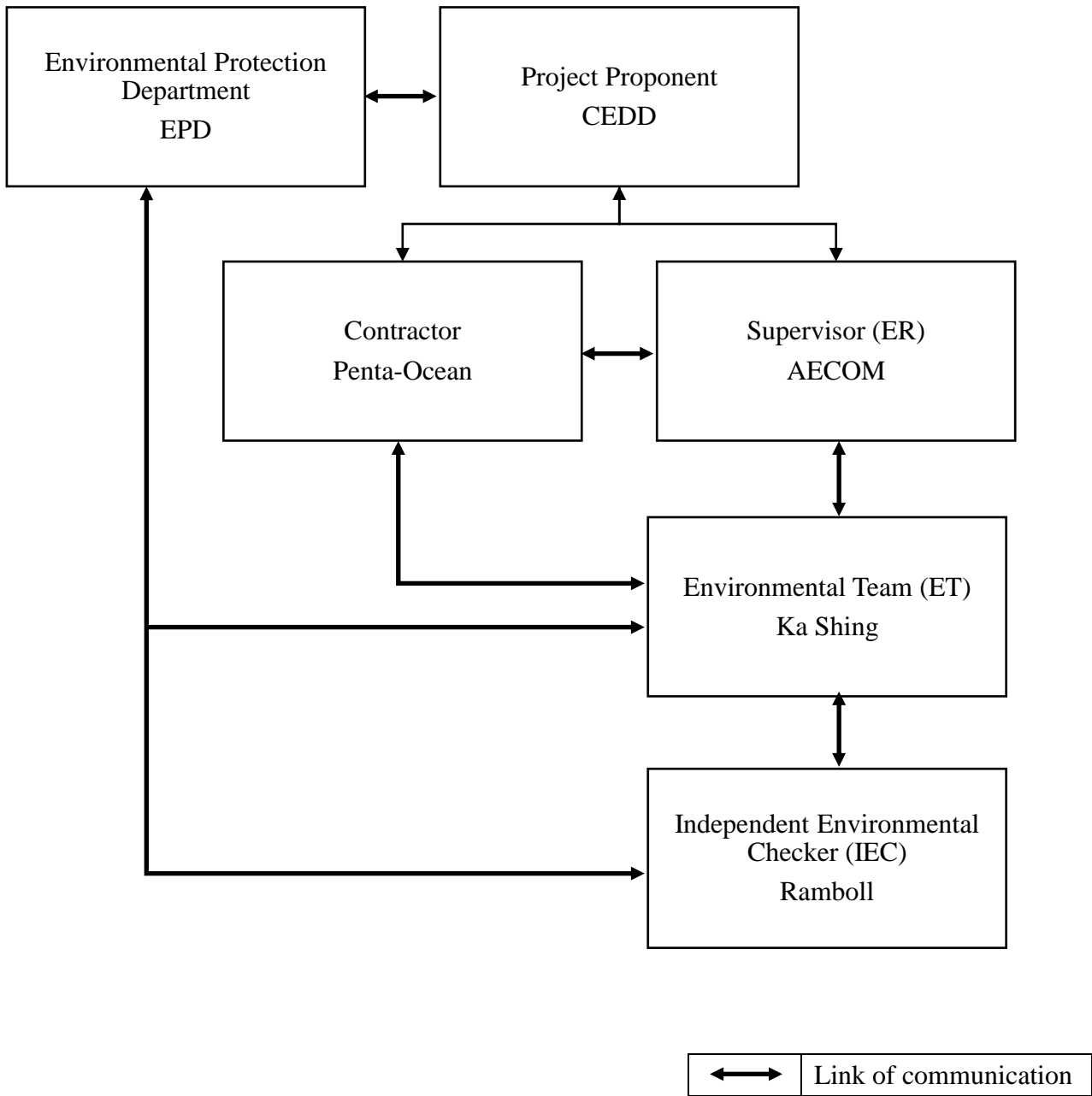


Figure 6 – Noise Monitoring Stations

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





# Appendix B – Construction Programme





























































































**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 December 2021

December 2021

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

NOTE:

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

**Air Quality Monitoring Station**

AM3 - Sky Tower

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

AM7 - Hong Kong Children's Hospital

**Noise Quality Monitoring Station**

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

M12 - Hong Kong Children's Hospital



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 January 2022

January 2022

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

NOTE:

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

**Air Quality Monitoring Station**

AM3 - Sky Tower

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

AM7 - Hong Kong Children's Hospital

**Noise Quality Monitoring Station**

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

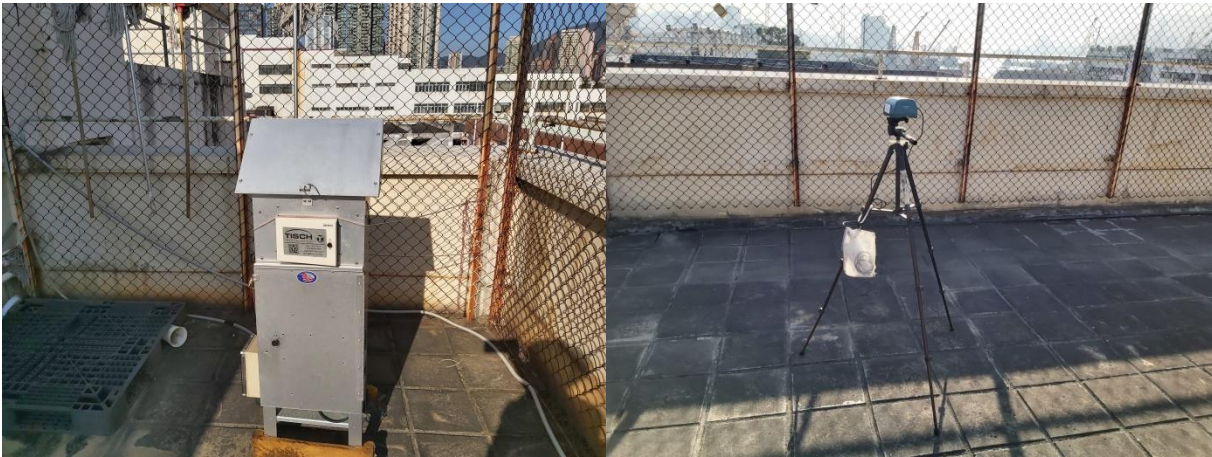
M12 - Hong Kong Children's Hospital

**Appendix D – Photographic records**

Impact Air Quality Monitoring



Measurement setup at AM3



Measurement setup at AM4(A)



Measurement setup at AM7



Impact Noise Monitoring



Measurement setup at M11



Measurement setup at M12



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

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

## Catalogue of High Volume Sampler (HVS)



### TSP MFC

Total Suspended Particulate, Mass Flow Controlled



**MFC TSP**  
Ambient Air Sampler

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

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

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

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## TSP MFC

MFC TSP Ambient Air Sampler

### General System Specifications

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

### Applications

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

### Optional Equipment

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

### Available Models

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

### Calibration Equipment

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

### Physical Specifications

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

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## Calibration Certificate of HVS

### Air Sampler Calibration Curve Plotting & Calculation

(Dickson recorder)

Calibration curve ref. No. : ATSPC-01-2021111801      Date of calibration : 18/11/2021

Location : Sky Tower      Sampler : TE-5170X

**Calibration Data**

Ambient barometric pressure, Pa = 760.6 ( mmHg )      Ambient temperature, Ta = 300.45 ( deg K )

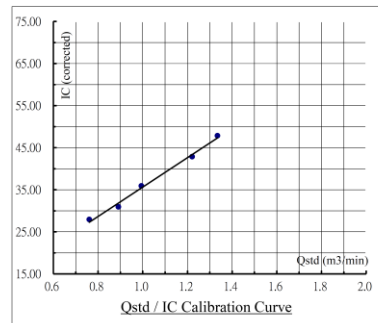
Qstd Slope, m = 2.03518      Qstd Intercept, b = -0.005890

**Calibration Curve**

Plate No.	H <sub>2</sub> O ( in )	Qstd ( m <sup>3</sup> / min )	I ( chart )	IC ( corrected )
18	7.40	1.335	48.0	47.82
13	6.20	1.222	43.0	42.84
10	4.10	0.994	36.0	35.87
7	3.30	0.892	31.0	30.89
5	2.40	0.761	28.0	27.90

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1 / m [ ( I ) ( \sqrt{ ( P_{av} / 760 ) ( 298 / T_{av} ) } ) - b ]$	34.907	0.7324	0.9962



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 :  $Qstd ( m^3 / min ) = 1/m [ \sqrt{ ( H_2O ( Pa / 760 ) ( 298 / Ta ) ) } - b ]$ .

$IC ( corrected ) = I [ \sqrt{ ( ( Pa / 760 ) ( 298 / Ta ) ) } ]$ .

$FLOW ( corrected ) = \sqrt{ ( FLOW ( mano ) ( Pa / 760 ) ( 298 / Ta ) )}$ .

Calibrated by :   
Name : ( Poon Tsz Wing )

Checked by :   
Name : ( Wong Yin Tong )

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

### Air Sampler Calibration Curve Plotting & Calculation

(Dickson recorder)

Calibration curve ref. No. : ATSPC-01-2021111802      Date of calibration : 18/11/2021

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

**Calibration Data**

Ambient barometric pressure, Pa = 760.6 ( mmHg )      Ambient temperature, Ta = 300.45 ( deg K )

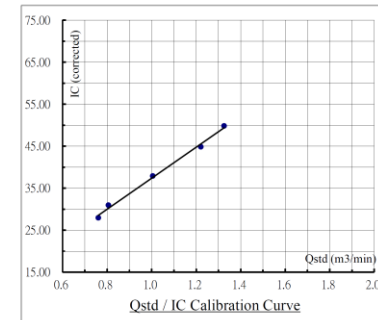
Qstd Slope, m = 2.03518      Qstd Intercept, b = -0.005890

**Calibration Curve**

Plate No.	H <sub>2</sub> O ( in )	Qstd ( m <sup>3</sup> / min )	I ( chart )	IC ( corrected )
18	7.30	1.326	50.0	49.81
13	6.20	1.222	45.0	44.83
10	4.20	1.006	38.0	37.86
7	2.70	0.807	31.0	30.89
5	2.40	0.761	28.0	27.90

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1 / m [ ( I ) ( \sqrt{ ( P_{av} / 760 ) ( 298 / T_{av} ) } ) - b ]$	36.925	0.4318	0.9976



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 :  $Qstd ( m^3 / min ) = 1/m [ \sqrt{ ( H_2O ( Pa / 760 ) ( 298 / Ta ) ) } - b ]$ .

$IC ( corrected ) = I [ \sqrt{ ( ( Pa / 760 ) ( 298 / Ta ) ) } ]$ .

$FLOW ( corrected ) = \sqrt{ ( FLOW ( mano ) ( Pa / 760 ) ( 298 / Ta ) )}$ .

Calibrated by :   
Name : ( Poon Tsz Wing )

Checked by :   
Name : ( Wong Yin Tong )

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

## Calibration Certificate of HVS

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

Calibration curve ref. No. : ATSPC-01-2021111803 Date of calibration : 18/11/2021  
 Location : Hong Kong Children's Hospital Sampler : TE-5170X

**Calibration Data**

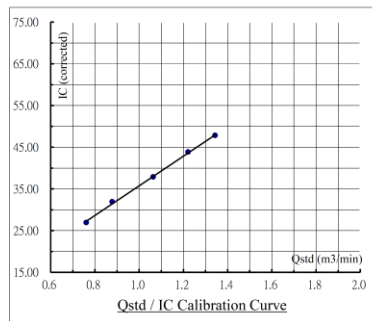
Ambient barometric pressure, Pa = 760.6 ( mmHg ) Ambient temperature, Ta = 300.45 ( deg K )  
 Qstd Slope, m = 2.03518 Qstd Intercept, b = -0.005890

**Calibration Curve**

Plate No.	H <sub>2</sub> O ( in )	Qstd ( m <sup>3</sup> / min )	I ( chart )	IC ( corrected )
18	7.50	1.344	48.0	47.82
13	6.20	1.222	44.0	43.84
10	4.70	1.064	38.0	37.86
7	3.20	0.879	32.0	31.88
5	2.40	0.761	27.0	26.90

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1 / m [ ( I ) ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	35.609	0.1282	0.9993



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 :   
 Name : ( Poon Tsz Wing )

Checked by :   
 Name : ( Wong Yin Tong )

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

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

Calibration curve ref. No. : ATSPC-01-2021072001 Date of calibration : 20/07/2021  
 Model no : GS2310 Serial number : 10346

**Calibration Data**

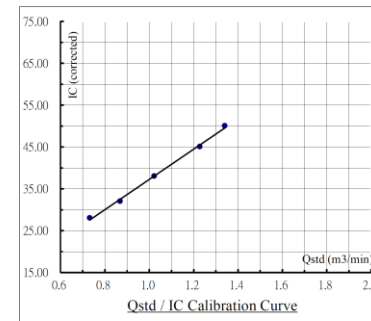
Ambient barometric pressure, Pa = 767.4 ( mmHg ) Ambient temperature, Ta = 300.25 ( deg K )  
 Qstd Slope, m = 2.03518 Qstd Intercept, b = -0.005890

**Calibration Curve**

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

**Subsequent calculation of sampler flow**

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



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

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

Calibrated by :   
 Name : ( Poon Tsz Wing )

Checked by :   
 Name : ( Wong Yin Tong )

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



# Calibration Certificate for Calibrator



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

## Certificate of Calibration

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

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

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left( \frac{Ta}{Pa} \right)}$ (y-axis)
1.0094	0.7024	1.4239	0.9958	0.6929	0.8796
1.0051	0.9922	2.0136	0.9915	0.9788	1.2439
1.0029	1.1070	2.2513	0.9894	1.0921	1.3907
1.0017	1.1662	2.3612	0.9882	1.1504	1.4586
0.9964	1.4014	2.8477	0.9829	1.3824	1.7591
<b>QSTD</b>	m=	<b>2.03518</b>	<b>QA</b>	m=	<b>1.27440</b>
	b=	<b>-0.00589</b>		b=	<b>-0.00364</b>
	r=	<b>0.99997</b>		r=	<b>0.99997</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:	
$Qstd = 1/m \left( \left( \sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)} \right)^{-b} \right)$	$Qa = 1/m \left( \left( \sqrt{\Delta H \left( \frac{Ta}{Pa} \right)} \right)^{-b} \right)$

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

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

Tisch Environmental, Inc.  
5 South Miami Avenue  
Cleveland, 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)

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

<b>Environment Conditions</b>		<b>Model</b>	<b>AM510</b>
Temperature	74.45 (23.6) °F (°C)	<b>Serial Number</b>	<b>11204040</b>
Relative Humidity	23.0 %RH		
Barometric Pressure	29.53 (1000.0) inHg (hPa)		

As Left       In Tolerance  
 As Found       Out of Tolerance

**Concentration Linearity Plot**  

○ = In Tolerance  
● = Out of Tolerance

System ID: DT1101-02

CONCENTRATION				Unit: ng/m <sup>3</sup>			
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	2.044	1.974	1.840-2.248	3	0.110	0.108	0.077-0.143
2	0.299	0.299	0.254-0.344	4	14.528	14.485	13.075-15.981

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. All test dust (Arizona dust). Our calibration ratio is greater than 1:1.

<table border="0"> <tr> <th>Measurement Variable</th> <th>System ID</th> <th>Last Cal.</th> <th>Cal. Due</th> </tr> <tr> <td>DC Voltage</td> <td>E003314</td> <td>01-11-21</td> <td>01-31-22</td> </tr> <tr> <td>Microbalance</td> <td>M001324</td> <td>10-16-20</td> <td>10-31-22</td> </tr> <tr> <td>Flowmeter</td> <td>E005140</td> <td>01-09-20</td> <td>01-31-21</td> </tr> </table>	Measurement Variable	System ID	Last Cal.	Cal. Due	DC Voltage	E003314	01-11-21	01-31-22	Microbalance	M001324	10-16-20	10-31-22	Flowmeter	E005140	01-09-20	01-31-21	<table border="0"> <tr> <th>Measurement Variable</th> <th>System ID</th> <th>Last Cal.</th> <th>Cal. Due</th> </tr> <tr> <td>Photometer</td> <td>E005612</td> <td>08-19-20</td> <td>02-28-21</td> </tr> <tr> <td>Pressure</td> <td>E003511</td> <td>10-26-20</td> <td>10-31-21</td> </tr> <tr> <td>DC Voltage</td> <td>E003315</td> <td>01-11-21</td> <td>01-31-22</td> </tr> </table>	Measurement Variable	System ID	Last Cal.	Cal. Due	Photometer	E005612	08-19-20	02-28-21	Pressure	E003511	10-26-20	10-31-21	DC Voltage	E003315	01-11-21	01-31-22
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Pressure	E003511	10-26-20	10-31-21																														
DC Voltage	E003315	01-11-21	01-31-22																														

Calibrated

January 27, 2021  
 Date

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

Performance Check ref. No. AS0210410-2      Report Issue Date 10/04/2021  
 Date of performance check 08/04/2021

**Objective:**

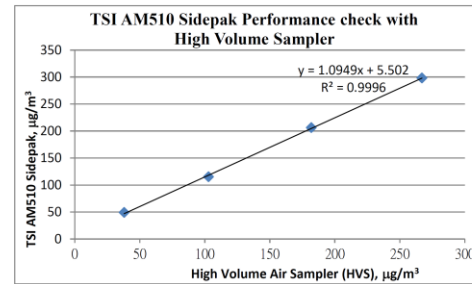
A dust meter and a Total Suspended Particulate High Volume Air Sampler (HVS) were placed together to measure the Total Suspended Particulate (TSP) concentrations simultaneously to check the performance.

**Equipment Used:**

Equipment	Manufacturer and Model	Serial Number
Personal Aerosol Monitor	TSI AM510 Sidepak	11204040
Total Suspended Particulate High Volume Air Sampler	GS2310	10346

**Results:**

Equipment	Measurement Result, µg/m <sup>3</sup>			
TSI AM510 Sidepak	49	115	206	298
High Volume Air Sampler (HVS)	38	103	182	267



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

Form No. ENV CAL SAMPLER CCI 4412/12/2003





# Catalogue of Weather Station

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



**6152C  
6162C**  
**Vantage Pro2™**

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

### Integrated Sensor Suite (ISS)

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

Note: Maximum displayable wind decreases as the length of cable increases. At 140' (42 m) of cable, the maximum wind speed displayed is 135 mph (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

Wind Chill (Calculated)	
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

### Wind Direction

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

### Wind Speed

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.: CC0062109**

**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. :	6152CUK
Serial No. :	BD181101023
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 :	6 September 2021

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

Date of calibration :	6 September 2021
-----------------------	------------------

Approved Signatory  
Warren Yeung

Company Chop:  
Certificate issue date: 7 September 2021



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- The certificate is issued subject to the latest Term and Condition, available assessable at our web site

Cal Lab Limited  
Address: Room 2103, Technology Plaza, 29-35 Sha Tsui Road, Tsuen Wan, NT, Hong Kong  
Tel : (852)25680106 Fax(852)30116194 Email: [info@callab.com.hk](mailto:info@callab.com.hk) Website: [callab.com.hk](http://callab.com.hk)

CT-BEG-02  
Page 1 of 4  
cc0062109



**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: 1.0 °C

Technical Requirement: N/A

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

CT-001-04

**b) Relative Humidity**

Temperature setting of humidity chamber : 23 °C

Reference reading ; % RH	Reading ; % RH	Error of indication ; % RH
40.0	42	5.0
50.0	54	8.0
70.0	73	4.3

Estimated expanded uncertainty: 3 %RH

Technical Requirement: N/A

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

CT-002-04

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## 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	2.1	5.0
5.0	5.2	4.0
8.0	8.4	5.0

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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### 5. Reference method for calibration

Temperature	JJF 1183-2007
Relative humidity	JJG 1076-2001
Wind Speed	SOP-251
Wind Direction	SOP-252

### 6. Environment condition of calibration

Temperature	23.5 °C
Relative humidity	54 %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 2022	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 shows in this calibration certificate relate only to the item calibrated, and the result only applies to the calibration item as received.

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

CT-END-02

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**Appendix F – Weather information**



## General Information

Date	Absolute Daily Min Temperature (°C)	Absolute Daily Max Temperature (°C)	Total Rainfall (mm)
01/12/2021	14.8	20.1	0
02/12/2021	14.6	20.4	0
03/12/2021	14.7	21.3	0
04/12/2021	15.3	20.6	0
05/12/2021	16.7	22.2	0
06/12/2021	16.4	22.2	0
07/12/2021	17.1	22.5	0
08/12/2021	18.4	22.2	0
09/12/2021	18.7	22.9	0
10/12/2021	18.6	23.7	0
11/12/2021	20	24.4	0
12/12/2021	19.2	24.7	0
13/12/2021	17.4	21.5	0
14/12/2021	18.7	23.6	Trace
15/12/2021	19.9	23	0.2
16/12/2021	21.7	25.8	Trace
17/12/2021	18.9	23.8	0
18/12/2021	16.3	20	0
19/12/2021	16	19.7	0
20/12/2021	15.7	19.3	9.4
21/12/2021	16	19	2.4
22/12/2021	17.1	21.7	Trace
23/12/2021	18.7	21.9	0.8
24/12/2021	18.2	21.8	1.7
25/12/2021	17.9	21.5	Trace
26/12/2021	11.7	18.5	3.5
27/12/2021	9.9	14.6	1.3
28/12/2021	12.2	17.5	0.2
29/12/2021	16.6	20.6	0
30/12/2021	16.2	21.4	0
31/12/2021	17.1	19.9	Trace

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=12>

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
01/12/2021	0:00	1.3	22.5	02/12/2021	0:00	0.9	22.5	03/12/2021	0:00	0.9	22.5	04/12/2021	0:00	0.9	67.5
01/12/2021	1:00	0.4	22.5	02/12/2021	1:00	0.9	225	03/12/2021	1:00	0.9	225	04/12/2021	1:00	0.9	67.5
01/12/2021	2:00	0.9	315	02/12/2021	2:00	0.9	247.5	03/12/2021	2:00	0.4	247.5	04/12/2021	2:00	0.9	90
01/12/2021	3:00	0.9	90	02/12/2021	3:00	1.3	247.5	03/12/2021	3:00	0.9	247.5	04/12/2021	3:00	1.3	112.5
01/12/2021	4:00	0.9	247.5	02/12/2021	4:00	0.9	270	03/12/2021	4:00	0.9	270	04/12/2021	4:00	2.2	67.5
01/12/2021	5:00	0.4	90	02/12/2021	5:00	1.3	112.5	03/12/2021	5:00	0.9	112.5	04/12/2021	5:00	1.8	90
01/12/2021	6:00	0.9	315	02/12/2021	6:00	0.4	270	03/12/2021	6:00	0.4	270	04/12/2021	6:00	1.8	90
01/12/2021	7:00	0.9	22.5	02/12/2021	7:00	0.4	45	03/12/2021	7:00	0.4	270	04/12/2021	7:00	1.8	67.5
01/12/2021	8:00	0.9	315	02/12/2021	8:00	0.4	315	03/12/2021	8:00	0.4	45	04/12/2021	8:00	0.9	67.5
01/12/2021	9:00	0.9	67.5	02/12/2021	9:00	0.4	67.5	03/12/2021	9:00	0.4	315	04/12/2021	9:00	1.8	67.5
01/12/2021	10:00	0.4	315	02/12/2021	10:00	0.4	112.5	03/12/2021	10:00	0.4	67.5	04/12/2021	10:00	2.7	67.5
01/12/2021	11:00	0.4	337.5	02/12/2021	11:00	0.9	135	03/12/2021	11:00	0.9	112.5	04/12/2021	11:00	2.7	45
01/12/2021	12:00	0.4	45	02/12/2021	12:00	0.4	90	03/12/2021	12:00	0.4	22.5	04/12/2021	12:00	1.3	67.5
01/12/2021	13:00	0.4	22.5	02/12/2021	13:00	0.4	247.5	03/12/2021	13:00	0.9	315	04/12/2021	13:00	1.3	45
01/12/2021	14:00	0.9	22.5	02/12/2021	14:00	0.9	67.5	03/12/2021	14:00	0.9	67.5	04/12/2021	14:00	1.3	45
01/12/2021	15:00	0.9	67.5	02/12/2021	15:00	0.4	247.5	03/12/2021	15:00	0.9	22.5	04/12/2021	15:00	0.9	67.5
01/12/2021	16:00	0.9	45	02/12/2021	16:00	0.4	112.5	03/12/2021	16:00	0.9	270	04/12/2021	16:00	1.3	112.5
01/12/2021	17:00	0.9	45	02/12/2021	17:00	0.4	337.5	03/12/2021	17:00	0.4	157.5	04/12/2021	17:00	0.9	135
01/12/2021	18:00	1.3	22.5	02/12/2021	18:00	0.4	337.5	03/12/2021	18:00	0.4	247.5	04/12/2021	18:00	1.3	112.5
01/12/2021	19:00	0.9	22.5	02/12/2021	19:00	0.9	135	03/12/2021	19:00	0.4	337.5	04/12/2021	19:00	1.3	112.5
01/12/2021	20:00	1.3	337.5	02/12/2021	20:00	0.9	45	03/12/2021	20:00	0.4	112.5	04/12/2021	20:00	1.3	112.5
01/12/2021	21:00	0.4	337.5	02/12/2021	21:00	0.9	90	03/12/2021	21:00	0.4	135	04/12/2021	21:00	1.3	67.5
01/12/2021	22:00	0.4	337.5	02/12/2021	22:00	0.4	45	03/12/2021	22:00	0.9	112.5	04/12/2021	22:00	0.9	135
01/12/2021	23:00	0.4	157.5	02/12/2021	23:00	0.4	45	03/12/2021	23:00	0.4	112.5	04/12/2021	23:00	1.3	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
05/12/2021	0:00	0.4	135	06/12/2021	0:00	0.9	157.5	07/12/2021	0:00	0.4	112.5	08/12/2021	0:00	0.9	90
05/12/2021	1:00	0.4	90	06/12/2021	1:00	0.9	22.5	07/12/2021	1:00	1.3	112.5	08/12/2021	1:00	1.3	112.5
05/12/2021	2:00	0.9	112.5	06/12/2021	2:00	0.4	22.5	07/12/2021	2:00	0.9	135	08/12/2021	2:00	0.9	90
05/12/2021	3:00	2.2	67.5	06/12/2021	3:00	0.4	45	07/12/2021	3:00	0.9	135	08/12/2021	3:00	0.9	67.5
05/12/2021	4:00	1.8	90	06/12/2021	4:00	0.9	135	07/12/2021	4:00	1.3	112.5	08/12/2021	4:00	0.9	292.5
05/12/2021	5:00	1.8	90	06/12/2021	5:00	0.9	112.5	07/12/2021	5:00	1.3	112.5	08/12/2021	5:00	0.9	67.5
05/12/2021	6:00	1.8	112.5	06/12/2021	6:00	1.3	135	07/12/2021	6:00	0.9	90	08/12/2021	6:00	0.9	45
05/12/2021	7:00	1.3	90	06/12/2021	7:00	1.3	135	07/12/2021	7:00	0.9	112.5	08/12/2021	7:00	0.4	135
05/12/2021	8:00	1.3	112.5	06/12/2021	8:00	0.9	22.5	07/12/2021	8:00	0.4	90	08/12/2021	8:00	0.9	112.5
05/12/2021	9:00	1.3	90	06/12/2021	9:00	0.4	112.5	07/12/2021	9:00	0.4	90	08/12/2021	9:00	0.9	90
05/12/2021	10:00	0.9	90	06/12/2021	10:00	0.4	112.5	07/12/2021	10:00	1.3	67.5	08/12/2021	10:00	0.9	90
05/12/2021	11:00	1.3	112.5	06/12/2021	11:00	1.3	112.5	07/12/2021	11:00	0.9	157.5	08/12/2021	11:00	0.9	112.5
05/12/2021	12:00	0.9	112.5	06/12/2021	12:00	0.9	112.5	07/12/2021	12:00	0.4	337.5	08/12/2021	12:00	0.4	112.5
05/12/2021	13:00	1.3	67.5	06/12/2021	13:00	0.4	315	07/12/2021	13:00	0.9	22.5	08/12/2021	13:00	0.4	112.5
05/12/2021	14:00	1.3	90	06/12/2021	14:00	0.4	67.5	07/12/2021	14:00	0.9	22.5	08/12/2021	14:00	0.4	112.5
05/12/2021	15:00	1.3	112.5	06/12/2021	15:00	1.3	112.5	07/12/2021	15:00	0.9	22.5	08/12/2021	15:00	0.4	112.5
05/12/2021	16:00	1.3	90	06/12/2021	16:00	0.9	135	07/12/2021	16:00	0.4	315	08/12/2021	16:00	0.4	67.5
05/12/2021	17:00	0.9	90	06/12/2021	17:00	0.4	112.5	07/12/2021	17:00	0.4	90	08/12/2021	17:00	0.9	67.5
05/12/2021	18:00	1.3	112.5	06/12/2021	18:00	0.9	112.5	07/12/2021	18:00	0.4	90	08/12/2021	18:00	1.3	292.5
05/12/2021	19:00	0.9	90	06/12/2021	19:00	0.9	90	07/12/2021	19:00	0.4	90	08/12/2021	19:00	1.3	337.5
05/12/2021	20:00	1.3	112.5	06/12/2021	20:00	0.9	292.5	07/12/2021	20:00	0.9	247.5	08/12/2021	20:00	1.3	315
05/12/2021	21:00	0.9	112.5	06/12/2021	21:00	0.9	112.5	07/12/2021	21:00	0.4	180	08/12/2021	21:00	0.9	22.5
05/12/2021	22:00	1.3	67.5	06/12/2021	22:00	0.9	337.5	07/12/2021	22:00	0.4	337.5	08/12/2021	22:00	0.9	67.5
05/12/2021	23:00	0.9	67.5	06/12/2021	23:00	0.4	247.5	07/12/2021	23:00	0.4	337.5	08/12/2021	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
09/12/2021	0:00	0.4	22.5	10/12/2021	0:00	0.4	90	11/12/2021	0:00	1.8	337.5	12/12/2021	0:00	0.9	112.5
09/12/2021	1:00	0.9	112.5	10/12/2021	1:00	0.9	22.5	11/12/2021	1:00	2.2	67.5	12/12/2021	1:00	0.9	112.5
09/12/2021	2:00	0.4	22.5	10/12/2021	2:00	0.4	135	11/12/2021	2:00	2.7	67.5	12/12/2021	2:00	0.4	67.5
09/12/2021	3:00	0.9	22.5	10/12/2021	3:00	0.4	90	11/12/2021	3:00	3.1	112.5	12/12/2021	3:00	1.3	112.5
09/12/2021	4:00	1.3	45	10/12/2021	4:00	0.9	135	11/12/2021	4:00	2.2	45	12/12/2021	4:00	0.9	90
09/12/2021	5:00	0.9	22.5	10/12/2021	5:00	0.4	112.5	11/12/2021	5:00	1.8	45	12/12/2021	5:00	0.9	90
09/12/2021	6:00	0.4	22.5	10/12/2021	6:00	0.4	180	11/12/2021	6:00	1.3	135	12/12/2021	6:00	1.3	45
09/12/2021	7:00	0.4	45	10/12/2021	7:00	0.4	135	11/12/2021	7:00	1.3	90	12/12/2021	7:00	1.3	90
09/12/2021	8:00	0.4	45	10/12/2021	8:00	0.9	112.5	11/12/2021	8:00	1.3	90	12/12/2021	8:00	0.9	67.5
09/12/2021	9:00	0.4	45	10/12/2021	9:00	1.3	157.5	11/12/2021	9:00	1.3	67.5	12/12/2021	9:00	0.9	90
09/12/2021	10:00	0.4	0	10/12/2021	10:00	1.3	22.5	11/12/2021	10:00	1.3	90	12/12/2021	10:00	0.4	112.5
09/12/2021	11:00	0.4	22.5	10/12/2021	11:00	1.3	22.5	11/12/2021	11:00	1.3	90	12/12/2021	11:00	0.4	67.5
09/12/2021	12:00	0.4	67.5	10/12/2021	12:00	1.8	90	11/12/2021	12:00	2.7	112.5	12/12/2021	12:00	1.3	67.5
09/12/2021	13:00	0.4	22.5	10/12/2021	13:00	1.3	45	11/12/2021	13:00	2.2	90	12/12/2021	13:00	0.9	135
09/12/2021	14:00	0.4	45	10/12/2021	14:00	1.3	45	11/12/2021	14:00	1.3	90	12/12/2021	14:00	0.4	135
09/12/2021	15:00	1.3	90	10/12/2021	15:00	1.8	90	11/12/2021	15:00	1.3	112.5	12/12/2021	15:00	0.9	112.5
09/12/2021	16:00	1.8	337.5	10/12/2021	16:00	1.3	45	11/12/2021	16:00	1.3	112.5	12/12/2021	16:00	0.9	135
09/12/2021	17:00	2.7	315	10/12/2021	17:00	1.8	22.5	11/12/2021	17:00	0.9	90	12/12/2021	17:00	0.9	135
09/12/2021	18:00	2.2	22.5	10/12/2021	18:00	0.9	67.5	11/12/2021	18:00	1.3	112.5	12/12/2021	18:00	0.9	22.5
09/12/2021	19:00	2.2	22.5	10/12/2021	19:00	1.3	22.5	11/12/2021	19:00	0.9	90	12/12/2021	19:00	0.9	112.5
09/12/2021	20:00	2.2	22.5	10/12/2021	20:00	0.9	45	11/12/2021	20:00	1.3	112.5	12/12/2021	20:00	0.4	112.5
09/12/2021	21:00	2.2	22.5	10/12/2021	21:00	0.9	90	11/12/2021	21:00	1.3	90	12/12/2021	21:00	0.4	112.5
09/12/2021	22:00	1.8	67.5	10/12/2021	22:00	0.9	90	11/12/2021	22:00	1.3	90	12/12/2021	22:00	1.3	112.5
09/12/2021	23:00	1.8	0	10/12/2021	23:00	0.4	337.5	11/12/2021	23:00	1.3	112.5	12/12/2021	23:00	0.9	315

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
13/12/2021	0:00	1.3	45	14/12/2021	0:00	1.3	22.5	15/12/2021	0:00	0.9	112.5	16/12/2021	0:00	1.8	67.5
13/12/2021	1:00	1.3	202.5	14/12/2021	1:00	0.9	135	15/12/2021	1:00	0.4	67.5	16/12/2021	1:00	1.3	90
13/12/2021	2:00	0.9	90	14/12/2021	2:00	0.9	337.5	15/12/2021	2:00	1.3	90	16/12/2021	2:00	1.3	45
13/12/2021	3:00	0.9	315	14/12/2021	3:00	1.3	22.5	15/12/2021	3:00	0.9	292.5	16/12/2021	3:00	1.3	90
13/12/2021	4:00	0.9	337.5	14/12/2021	4:00	1.8	22.5	15/12/2021	4:00	0.4	90	16/12/2021	4:00	1.3	135
13/12/2021	5:00	1.3	337.5	14/12/2021	5:00	1.3	22.5	15/12/2021	5:00	0.4	112.5	16/12/2021	5:00	0.9	67.5
13/12/2021	6:00	0.9	270	14/12/2021	6:00	1.8	45	15/12/2021	6:00	0.4	90	16/12/2021	6:00	0.9	90
13/12/2021	7:00	0.4	315	14/12/2021	7:00	1.3	22.5	15/12/2021	7:00	0.4	337.5	16/12/2021	7:00	0.9	90
13/12/2021	8:00	0	337.5	14/12/2021	8:00	1.3	337.5	15/12/2021	8:00	1.3	22.5	16/12/2021	8:00	0.9	67.5
13/12/2021	9:00	0.4	22.5	14/12/2021	9:00	1.3	22.5	15/12/2021	9:00	1.3	112.5	16/12/2021	9:00	0.9	67.5
13/12/2021	10:00	0	22.5	14/12/2021	10:00	0.9	90	15/12/2021	10:00	0.9	22.5	16/12/2021	10:00	0.9	112.5
13/12/2021	11:00	0	22.5	14/12/2021	11:00	0.4	90	15/12/2021	11:00	0.4	45	16/12/2021	11:00	0.9	67.5
13/12/2021	12:00	0	22.5	14/12/2021	12:00	0.4	45	15/12/2021	12:00	0.9	112.5	16/12/2021	12:00	0.9	135
13/12/2021	13:00	0.4	22.5	14/12/2021	13:00	0.4	292.5	15/12/2021	13:00	0.4	112.5	16/12/2021	13:00	0.9	45
13/12/2021	14:00	0.4	45	14/12/2021	14:00	0.4	90	15/12/2021	14:00	0.4	112.5	16/12/2021	14:00	1.3	90
13/12/2021	15:00	0.9	337.5	14/12/2021	15:00	0.4	45	15/12/2021	15:00	0.9	337.5	16/12/2021	15:00	1.3	67.5
13/12/2021	16:00	0.4	22.5	14/12/2021	16:00	0.9	90	15/12/2021	16:00	0.9	112.5	16/12/2021	16:00	0.4	67.5
13/12/2021	17:00	0.4	157.5	14/12/2021	17:00	0.9	337.5	15/12/2021	17:00	1.3	45	16/12/2021	17:00	0.4	112.5
13/12/2021	18:00	0.9	112.5	14/12/2021	18:00	0.4	337.5	15/12/2021	18:00	1.3	90	16/12/2021	18:00	0.4	67.5
13/12/2021	19:00	0.4	112.5	14/12/2021	19:00	0.9	135	15/12/2021	19:00	0.4	90	16/12/2021	19:00	0.4	135
13/12/2021	20:00	0.4	135	14/12/2021	20:00	0.4	270	15/12/2021	20:00	0.9	112.5	16/12/2021	20:00	0.4	45
13/12/2021	21:00	0.4	90	14/12/2021	21:00	0.9	270	15/12/2021	21:00	1.3	90	16/12/2021	21:00	0.4	90
13/12/2021	22:00	0.9	135	14/12/2021	22:00	1.3	112.5	15/12/2021	22:00	1.3	90	16/12/2021	22:00	0.4	67.5
13/12/2021	23:00	1.3	112.5	14/12/2021	23:00	1.3	135	15/12/2021	23:00	1.8	112.5	16/12/2021	23:00	0.4	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
17/12/2021	0:00	1.3	90	18/12/2021	0:00	0.4	157.5	19/12/2021	0:00	0.9	67.5	20/12/2021	0:00	0.9	90
17/12/2021	1:00	1.3	157.5	18/12/2021	1:00	0.4	135	19/12/2021	1:00	1.3	270	20/12/2021	1:00	0.9	67.5
17/12/2021	2:00	0.9	135	18/12/2021	2:00	0.4	112.5	19/12/2021	2:00	0.9	135	20/12/2021	2:00	0.9	90
17/12/2021	3:00	0.4	90	18/12/2021	3:00	0.4	112.5	19/12/2021	3:00	1.3	337.5	20/12/2021	3:00	1.3	112.5
17/12/2021	4:00	1.3	135	18/12/2021	4:00	0.4	112.5	19/12/2021	4:00	0.4	67.5	20/12/2021	4:00	1.3	90
17/12/2021	5:00	1.8	112.5	18/12/2021	5:00	0.4	90	19/12/2021	5:00	0.4	202.5	20/12/2021	5:00	0.9	112.5
17/12/2021	6:00	0.9	270	18/12/2021	6:00	0.4	67.5	19/12/2021	6:00	0.4	67.5	20/12/2021	6:00	1.3	112.5
17/12/2021	7:00	0.9	315	18/12/2021	7:00	0.4	337.5	19/12/2021	7:00	0.4	112.5	20/12/2021	7:00	1.3	90
17/12/2021	8:00	1.3	315	18/12/2021	8:00	0.9	22.5	19/12/2021	8:00	1.8	45	20/12/2021	8:00	1.8	67.5
17/12/2021	9:00	1.3	22.5	18/12/2021	9:00	0.4	90	19/12/2021	9:00	0.9	90	20/12/2021	9:00	1.8	90
17/12/2021	10:00	0.9	22.5	18/12/2021	10:00	0.4	67.5	19/12/2021	10:00	0.9	67.5	20/12/2021	10:00	1.3	90
17/12/2021	11:00	0.9	22.5	18/12/2021	11:00	0.4	202.5	19/12/2021	11:00	1.3	22.5	20/12/2021	11:00	0.9	157.5
17/12/2021	12:00	1.3	225	18/12/2021	12:00	0.4	90	19/12/2021	12:00	0.9	135	20/12/2021	12:00	0.4	45
17/12/2021	13:00	1.3	45	18/12/2021	13:00	0.4	180	19/12/2021	13:00	0.4	135	20/12/2021	13:00	0.9	67.5
17/12/2021	14:00	1.8	22.5	18/12/2021	14:00	0.4	45	19/12/2021	14:00	0.4	112.5	20/12/2021	14:00	0.9	22.5
17/12/2021	15:00	1.3	67.5	18/12/2021	15:00	0.9	202.5	19/12/2021	15:00	0.9	22.5	20/12/2021	15:00	1.3	22.5
17/12/2021	16:00	1.3	135	18/12/2021	16:00	1.3	247.5	19/12/2021	16:00	0.9	45	20/12/2021	16:00	1.8	22.5
17/12/2021	17:00	1.8	67.5	18/12/2021	17:00	1.3	90	19/12/2021	17:00	0.4	337.5	20/12/2021	17:00	1.3	45
17/12/2021	18:00	0.9	270	18/12/2021	18:00	0.9	337.5	19/12/2021	18:00	1.3	45	20/12/2021	18:00	1.3	90
17/12/2021	19:00	0.9	0	18/12/2021	19:00	0.9	45	19/12/2021	19:00	0.9	45	20/12/2021	19:00	1.3	90
17/12/2021	20:00	0.4	315	18/12/2021	20:00	0.9	270	19/12/2021	20:00	0.9	112.5	20/12/2021	20:00	0.9	112.5
17/12/2021	21:00	0.4	22.5	18/12/2021	21:00	1.3	67.5	19/12/2021	21:00	0.9	67.5	20/12/2021	21:00	1.3	112.5
17/12/2021	22:00	0.4	22.5	18/12/2021	22:00	1.3	270	19/12/2021	22:00	0.4	22.5	20/12/2021	22:00	0.9	112.5
17/12/2021	23:00	1.3	67.5	18/12/2021	23:00	1.3	337.5	19/12/2021	23:00	0.9	112.5	20/12/2021	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
21/12/2021	0:00	1.8	247.5	22/12/2021	0:00	0.9	337.5	23/12/2021	0:00	0.9	337.5	24/12/2021	0:00	1.3	112.5
21/12/2021	1:00	1.8	90	22/12/2021	1:00	0.9	247.5	23/12/2021	1:00	0.4	90	24/12/2021	1:00	0.4	67.5
21/12/2021	2:00	1.3	337.5	22/12/2021	2:00	0.4	247.5	23/12/2021	2:00	0.4	22.5	24/12/2021	2:00	0.4	67.5
21/12/2021	3:00	1.3	135	22/12/2021	3:00	0.4	247.5	23/12/2021	3:00	0.4	22.5	24/12/2021	3:00	0	67.5
21/12/2021	4:00	1.8	337.5	22/12/2021	4:00	0.4	225	23/12/2021	4:00	0.9	157.5	24/12/2021	4:00	0.4	67.5
21/12/2021	5:00	2.2	90	22/12/2021	5:00	0.4	247.5	23/12/2021	5:00	0.4	157.5	24/12/2021	5:00	0.4	67.5
21/12/2021	6:00	1.3	90	22/12/2021	6:00	0.4	247.5	23/12/2021	6:00	0.4	45	24/12/2021	6:00	0.4	90
21/12/2021	7:00	1.3	90	22/12/2021	7:00	0.4	247.5	23/12/2021	7:00	0.4	90	24/12/2021	7:00	0.4	135
21/12/2021	8:00	1.8	45	22/12/2021	8:00	0.9	157.5	23/12/2021	8:00	0.9	135	24/12/2021	8:00	0	22.5
21/12/2021	9:00	1.8	112.5	22/12/2021	9:00	0.9	157.5	23/12/2021	9:00	0.9	112.5	24/12/2021	9:00	0	67.5
21/12/2021	10:00	1.8	90	22/12/2021	10:00	0.9	315	23/12/2021	10:00	0.4	337.5	24/12/2021	10:00	0	67.5
21/12/2021	11:00	2.2	112.5	22/12/2021	11:00	0.4	315	23/12/2021	11:00	0.4	270	24/12/2021	11:00	1.8	0
21/12/2021	12:00	2.2	67.5	22/12/2021	12:00	0.9	315	23/12/2021	12:00	0.4	225	24/12/2021	12:00	1.8	247.5
21/12/2021	13:00	1.8	292.5	22/12/2021	13:00	0.9	247.5	23/12/2021	13:00	0.4	112.5	24/12/2021	13:00	0.9	247.5
21/12/2021	14:00	1.3	67.5	22/12/2021	14:00	0.4	247.5	23/12/2021	14:00	0.9	112.5	24/12/2021	14:00	1.3	315
21/12/2021	15:00	0.9	112.5	22/12/2021	15:00	0.9	22.5	23/12/2021	15:00	0.9	67.5	24/12/2021	15:00	1.3	0
21/12/2021	16:00	0.9	157.5	22/12/2021	16:00	0.4	45	23/12/2021	16:00	0.9	45	24/12/2021	16:00	0.9	315
21/12/2021	17:00	0.9	67.5	22/12/2021	17:00	0.4	45	23/12/2021	17:00	0.4	112.5	24/12/2021	17:00	0.9	0
21/12/2021	18:00	1.3	112.5	22/12/2021	18:00	0.9	22.5	23/12/2021	18:00	0.4	135	24/12/2021	18:00	1.3	0
21/12/2021	19:00	0.9	202.5	22/12/2021	19:00	0.9	247.5	23/12/2021	19:00	0.9	112.5	24/12/2021	19:00	1.3	0
21/12/2021	20:00	0.9	67.5	22/12/2021	20:00	0.9	270	23/12/2021	20:00	0.9	135	24/12/2021	20:00	0.9	292.5
21/12/2021	21:00	0.4	225	22/12/2021	21:00	0.9	247.5	23/12/2021	21:00	0.9	135	24/12/2021	21:00	1.3	292.5
21/12/2021	22:00	0.4	247.5	22/12/2021	22:00	0.9	270	23/12/2021	22:00	0.4	135	24/12/2021	22:00	1.3	67.5
21/12/2021	23:00	0.9	247.5	22/12/2021	23:00	0.4	247.5	23/12/2021	23:00	0.4	135	24/12/2021	23:00	0.9	67.5

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

Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction
25/12/2021	0:00	0.9	247.5	26/12/2021	0:00	0.9	247.5	27/12/2021	0:00	0.4	135	28/12/2021	0:00	0.4	22.5
25/12/2021	1:00	0.9	90	26/12/2021	1:00	0.9	22.5	27/12/2021	1:00	0.4	112.5	28/12/2021	1:00	0.4	90
25/12/2021	2:00	0.9	157.5	26/12/2021	2:00	1.3	45	27/12/2021	2:00	1.8	112.5	28/12/2021	2:00	0.4	22.5
25/12/2021	3:00	0.9	67.5	26/12/2021	3:00	0.9	22.5	27/12/2021	3:00	0.9	112.5	28/12/2021	3:00	0.4	112.5
25/12/2021	4:00	0.9	67.5	26/12/2021	4:00	0.9	22.5	27/12/2021	4:00	0.4	45	28/12/2021	4:00	0.4	22.5
25/12/2021	5:00	0.9	112.5	26/12/2021	5:00	0.9	45	27/12/2021	5:00	0.4	247.5	28/12/2021	5:00	0.4	112.5
25/12/2021	6:00	0.9	67.5	26/12/2021	6:00	1.3	90	27/12/2021	6:00	0.4	247.5	28/12/2021	6:00	0.4	22.5
25/12/2021	7:00	0.9	337.5	26/12/2021	7:00	0.9	225	27/12/2021	7:00	0.9	180	28/12/2021	7:00	0.4	247.5
25/12/2021	8:00	0.9	90	26/12/2021	8:00	1.3	112.5	27/12/2021	8:00	0.4	90	28/12/2021	8:00	0.9	270
25/12/2021	9:00	0.4	90	26/12/2021	9:00	1.8	337.5	27/12/2021	9:00	0.4	247.5	28/12/2021	9:00	0.9	45
25/12/2021	10:00	0.4	90	26/12/2021	10:00	1.3	337.5	27/12/2021	10:00	0.4	225	28/12/2021	10:00	0.9	90
25/12/2021	11:00	0.4	112.5	26/12/2021	11:00	1.8	45	27/12/2021	11:00	0.4	225	28/12/2021	11:00	1.3	67.5
25/12/2021	12:00	0.4	135	26/12/2021	12:00	1.3	45	27/12/2021	12:00	1.3	180	28/12/2021	12:00	1.3	247.5
25/12/2021	13:00	0.4	135	26/12/2021	13:00	1.8	337.5	27/12/2021	13:00	0.4	270	28/12/2021	13:00	0.4	247.5
25/12/2021	14:00	0.9	112.5	26/12/2021	14:00	1.3	247.5	27/12/2021	14:00	0.9	202.5	28/12/2021	14:00	0.9	247.5
25/12/2021	15:00	0.9	22.5	26/12/2021	15:00	1.3	22.5	27/12/2021	15:00	0.4	202.5	28/12/2021	15:00	0.9	225
25/12/2021	16:00	0.9	22.5	26/12/2021	16:00	1.3	337.5	27/12/2021	16:00	0.9	247.5	28/12/2021	16:00	0.9	225
25/12/2021	17:00	0.9	22.5	26/12/2021	17:00	0.4	22.5	27/12/2021	17:00	0.9	247.5	28/12/2021	17:00	0.4	45
25/12/2021	18:00	1.3	67.5	26/12/2021	18:00	0.9	22.5	27/12/2021	18:00	0.4	225	28/12/2021	18:00	0.9	270
25/12/2021	19:00	1.8	90	26/12/2021	19:00	1.3	67.5	27/12/2021	19:00	0.9	157.5	28/12/2021	19:00	0.9	22.5
25/12/2021	20:00	0.9	270	26/12/2021	20:00	1.8	45	27/12/2021	20:00	0.9	135	28/12/2021	20:00	0.9	67.5
25/12/2021	21:00	0.9	270	26/12/2021	21:00	1.8	90	27/12/2021	21:00	0.9	135	28/12/2021	21:00	0.4	90
25/12/2021	22:00	0.9	135	26/12/2021	22:00	1.8	292.5	27/12/2021	22:00	1.3	337.5	28/12/2021	22:00	0.4	135
25/12/2021	23:00	0.9	22.5	26/12/2021	23:00	1.8	112.5	27/12/2021	23:00	0.9	225	28/12/2021	23:00	0	135



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

Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction	Date	Time	Wind Speed (m/s)	Wind Direction
29/12/2021	0:00	0.4	90	30/12/2021	0:00	0.9	225	31/12/2021	0:00	0.4	22.5				
29/12/2021	1:00	0.4	0	30/12/2021	1:00	0.4	247.5	31/12/2021	1:00	0.4	90				
29/12/2021	2:00	0.4	0	30/12/2021	2:00	0.9	292.5	31/12/2021	2:00	0.9	67.5				
29/12/2021	3:00	0.9	22.5	30/12/2021	3:00	0.4	247.5	31/12/2021	3:00	0.9	45				
29/12/2021	4:00	0.9	112.5	30/12/2021	4:00	0.4	247.5	31/12/2021	4:00	0.4	45				
29/12/2021	5:00	0.4	22.5	30/12/2021	5:00	0.9	225	31/12/2021	5:00	0.4	22.5				
29/12/2021	6:00	0.4	270	30/12/2021	6:00	0.9	247.5	31/12/2021	6:00	0.9	90				
29/12/2021	7:00	0.4	270	30/12/2021	7:00	0.4	225	31/12/2021	7:00	0.9	45				
29/12/2021	8:00	0.4	270	30/12/2021	8:00	0.4	225	31/12/2021	8:00	0.9	22.5				
29/12/2021	9:00	0.4	247.5	30/12/2021	9:00	0.4	247.5	31/12/2021	9:00	1.3	45				
29/12/2021	10:00	0.4	202.5	30/12/2021	10:00	0.4	225	31/12/2021	10:00	1.8	22.5				
29/12/2021	11:00	0.9	247.5	30/12/2021	11:00	0.4	180	31/12/2021	11:00	1.8	22.5				
29/12/2021	12:00	0.4	180	30/12/2021	12:00	0.4	247.5	31/12/2021	12:00	1.8	315				
29/12/2021	13:00	0.4	135	30/12/2021	13:00	0.4	225	31/12/2021	13:00	1.8	67.5				
29/12/2021	14:00	0.4	135	30/12/2021	14:00	0.4	225	31/12/2021	14:00	1.8	112.5				
29/12/2021	15:00	0.4	112.5	30/12/2021	15:00	0.9	202.5	31/12/2021	15:00	1.3	112.5				
29/12/2021	16:00	0.4	112.5	30/12/2021	16:00	0.4	180	31/12/2021	16:00	1.3	112.5				
29/12/2021	17:00	0.4	225	30/12/2021	17:00	0.4	225	31/12/2021	17:00	1.8	112.5				
29/12/2021	18:00	0.9	225	30/12/2021	18:00	1.3	157.5	31/12/2021	18:00	0.9	112.5				
29/12/2021	19:00	0.9	225	30/12/2021	19:00	0.9	157.5	31/12/2021	19:00	1.3	90				
29/12/2021	20:00	0.9	247.5	30/12/2021	20:00	0.4	157.5	31/12/2021	20:00	0.9	135				
29/12/2021	21:00	0.4	67.5	30/12/2021	21:00	0.9	157.5	31/12/2021	21:00	0.4	90				
29/12/2021	22:00	0.4	157.5	30/12/2021	22:00	0.4	157.5	31/12/2021	22:00	0.4	90				
29/12/2021	23:00	0.4	45	30/12/2021	23:00	0.4	112.5	31/12/2021	23:00	0.9	112.5				

# **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			
02/12/2021	Sunny	22.3	1021.8	14.9987	15.1613	0.1626	3805.07	3829.09	1441.2	54	54	1.54	2219	73
08/12/2021	Sunny	21.8	1022.3	18.3744	18.5243	0.1499	3830.24	3854.26	1441.2	46	46	1.31	1888	79
14/12/2021	Sunny	18.0	1018.6	18.3034	18.4651	0.1617	3855.09	3879.11	1441.2	46	46	1.32	1897	85
20/12/2021	Cloudy	19.6	1017.6	14.9824	15.0357	0.0533	3880.52	3904.55	1441.8	50	50	1.43	2058	26
24/12/2021	Sunny	24.0	1017.2	17.5981	17.7878	0.1897	3905.81	3929.83	1441.2	50	50	1.42	2042	93
30/12/2021	Sunny	16.0	1024.6	15.4292	15.6127	0.1835	3930.19	3954.21	1441.2	48	48	1.38	1993	92
													Maximum	93
													Minimum	26
													Average	75
													Action Level	182
													Limit Level	260

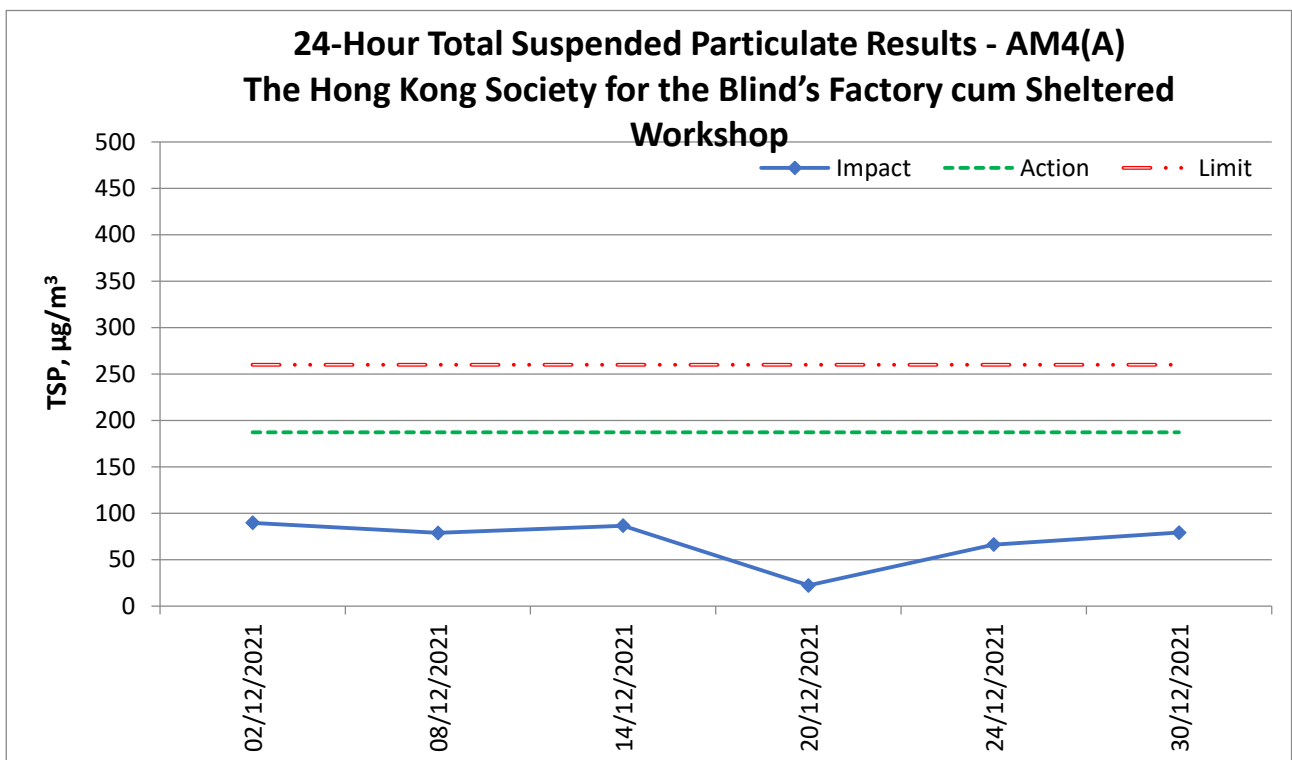
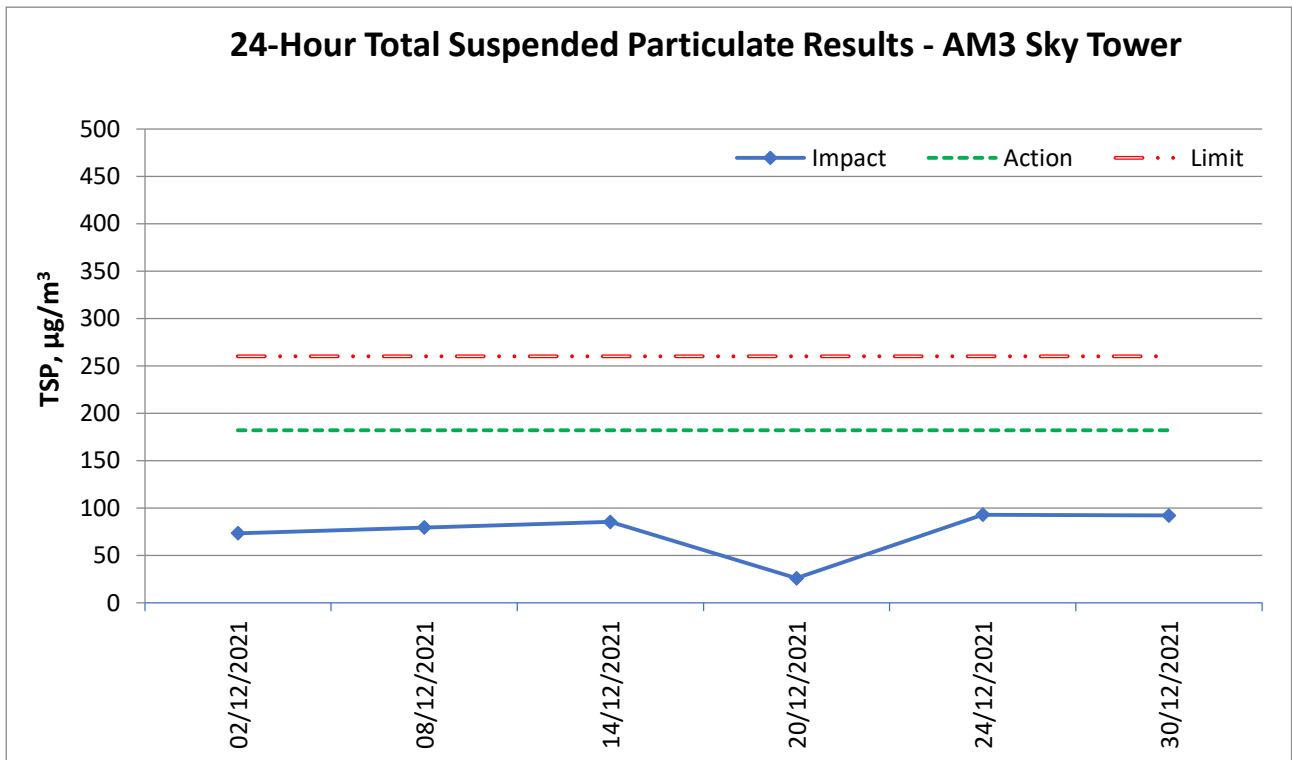
Location: AM4(A) – The Hong Kong Society for the Blind’s Factory cum Sheltered Workshop

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			
02/12/2021	Sunny	22.3	1021.8	15.2677	15.4426	0.1749	3437.45	3461.47	1441.2	50	50	1.35	1952	90
08/12/2021	Sunny	21.8	1022.3	18.4416	18.5954	0.1538	3461.81	3485.83	1441.2	50	50	1.36	1954	79
14/12/2021	Sunny	18.0	1018.6	15.4352	15.5982	0.163	3486.22	3510.24	1441.2	48	48	1.31	1884	87
20/12/2021	Cloudy	19.6	1017.6	18.3177	18.3594	0.0417	3511.36	3535.38	1441.2	48	48	1.30	1878	22
24/12/2021	Sunny	24.0	1017.2	17.9325	18.0559	0.1234	3536.58	3560.61	1441.8	48	48	1.29	1864	66
30/12/2021	Sunny	16.0	1024.6	18.1964	18.3529	0.1565	3561.02	3585.04	1441.2	50	50	1.37	1976	79
													Maximum	90
													Minimum	22
													Average	70
													Action Level	187
													Limit Level	260

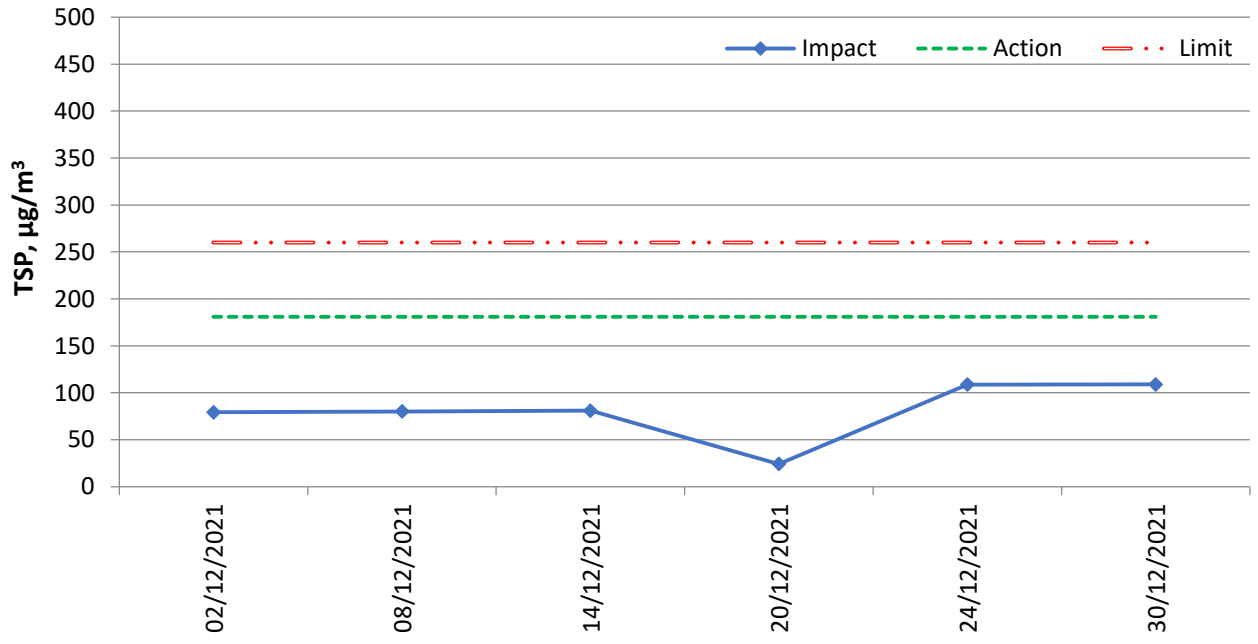
Location: AM7 – Hong Kong Children’s Hospital

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			
02/12/2021	Sunny	22.3	1021.8	15.0808	15.2423	0.1615	8327.97	8351.99	1441.2	50	50	1.41	2036	79
08/12/2021	Sunny	21.8	1022.3	15.3032	15.4601	0.1569	8352.43	8376.45	1441.2	48	48	1.36	1957	80
14/12/2021	Sunny	18.0	1018.6	15.6849	15.8441	0.1592	8377.41	8401.43	1441.2	48	48	1.36	1966	81
20/12/2021	Cloudy	19.6	1017.6	15.6013	15.6486	0.0473	8402.56	8426.59	1441.8	48	48	1.36	1960	24
24/12/2021	Sunny	24.0	1017.2	14.2782	14.4987	0.2205	8426.93	8450.96	1441.8	50	50	1.41	2027	109
30/12/2021	Sunny	16.0	1024.6	14.1384	14.3629	0.2245	8451.21	8475.23	1441.2	50	50	1.43	2061	109
												Maximum	109	
												Minimum	24	
												Average	80	
												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
		-			
02/12/2021	9:00	-	10:00	45	Sunny
	10:00	-	11:00	46	
	11:00	-	12:00	49	
08/12/2021	13:00	-	14:00	53	Sunny
	14:00	-	15:00	53	
	15:00	-	16:00	56	
14/12/2021	9:00	-	10:00	61	Sunny
	10:00	-	11:00	64	
	11:00	-	12:00	60	
20/12/2021	13:00	-	14:00	21	Cloudy
	14:00	-	15:00	23	
	15:00	-	16:00	24	
24/12/2021	13:00	-	14:00	68	Sunny
	14:00	-	15:00	75	
	15:00	-	16:00	76	
30/12/2021	9:00	-	10:00	72	Sunny
	10:00	-	11:00	80	
	11:00	-	12:00	82	
Maximum				82	
Minimum				21	
Average				56	
Action Level				297	
Limit Level				500	



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

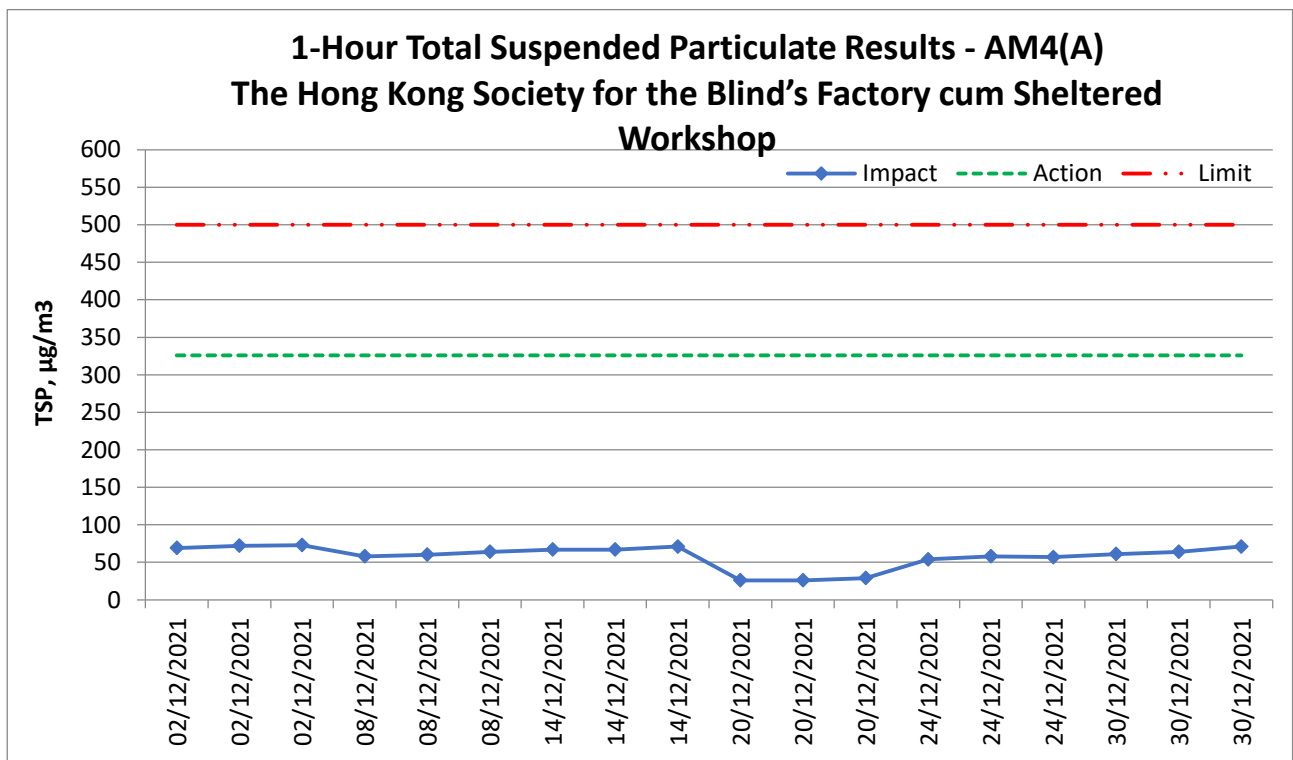
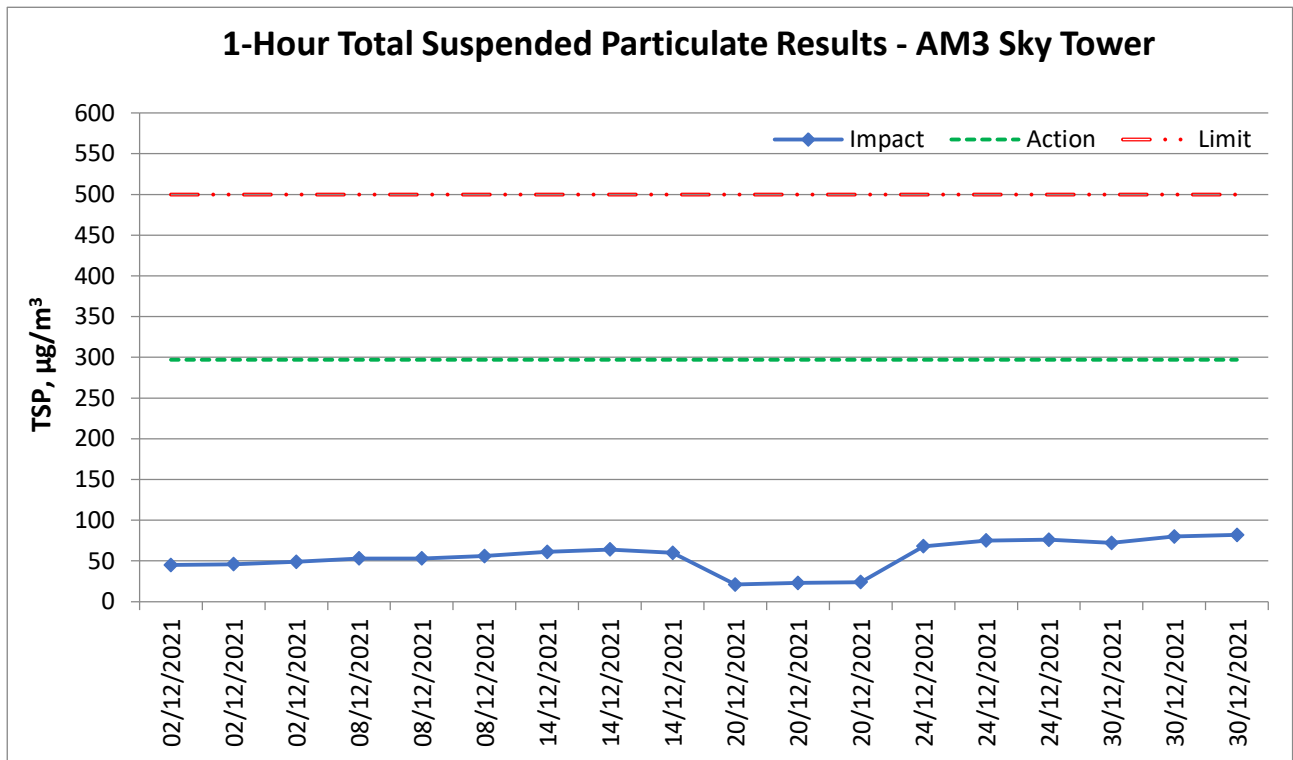
Date	Measurement Period			1-hr TSP concentration, $\mu\text{g}/\text{m}^3$	Weather
		-			
02/12/2021	13:00	-	14:00	69	Sunny
	14:00	-	15:00	72	
	15:00	-	16:00	73	
08/12/2021	9:00	-	10:00	58	Sunny
	10:00	-	11:00	60	
	11:00	-	12:00	64	
14/12/2021	9:00	-	10:00	67	Sunny
	10:00	-	11:00	67	
	11:00	-	12:00	71	
20/12/2021	13:00	-	14:00	26	Cloudy
	14:00	-	15:00	26	
	15:00	-	16:00	29	
24/12/2021	13:00	-	14:00	54	Sunny
	14:00	-	15:00	58	
	15:00	-	16:00	57	
30/12/2021	9:00	-	10:00	61	Sunny
	10:00	-	11:00	64	
	11:00	-	12:00	71	
Maximum				73	
Minimum				26	
Average				58	
Action Level				326	
Limit Level				500	

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

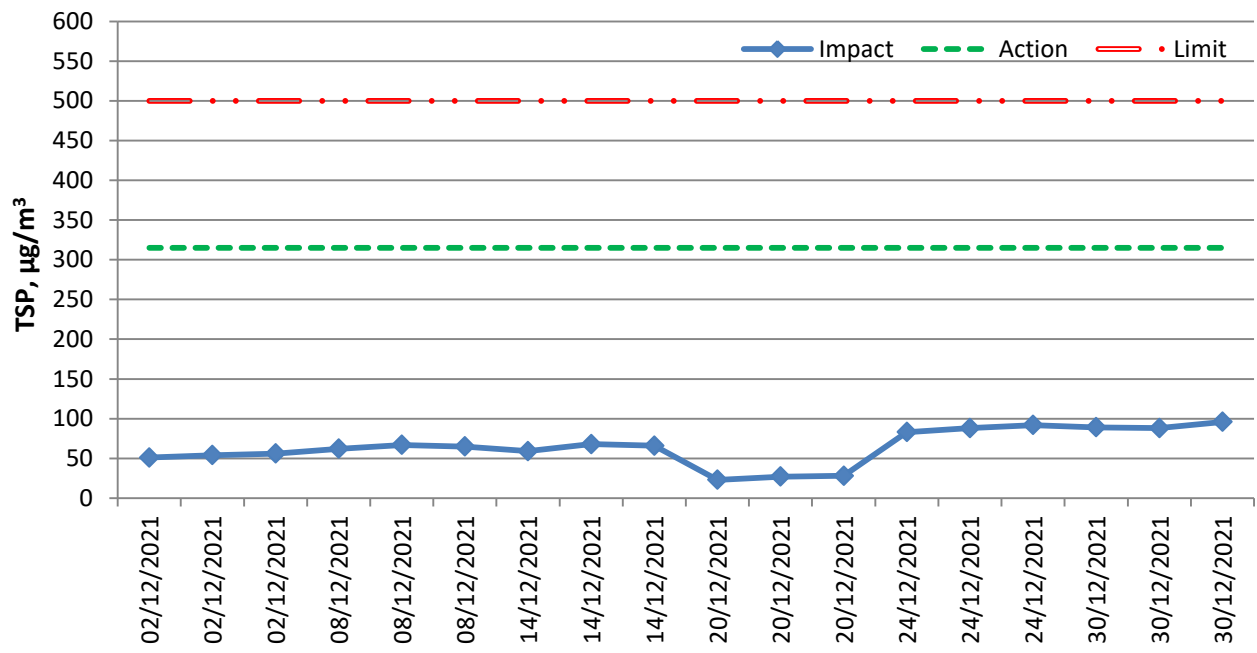
**Kong**

Date	Measurement Period			1-hr TSP concentration, μg/m <sup>3</sup>	Weather
		-			
02/12/2021	13:00	-	14:00	51	Sunny
	14:00	-	15:00	54	
	15:00	-	16:00	56	
08/12/2021	9:00	-	10:00	62	Sunny
	10:00	-	11:00	67	
	11:00	-	12:00	65	
14/12/2021	13:00	-	14:00	59	Sunny
	14:00	-	15:00	68	
	15:00	-	16:00	66	
20/12/2021	9:00	-	10:00	23	Cloudy
	10:00	-	11:00	27	
	11:00	-	12:00	28	
24/12/2021	9:00	-	10:00	83	Sunny
	10:00	-	11:00	88	
	11:00	-	12:00	92	
30/12/2021	13:00	-	14:00	89	Sunny
	14:00	-	15:00	88	
	15:00	-	16:00	96	
Maximum				96	
Minimum				23	
Average				65	
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. $L_p$ sampling cycle 100 ms, 200 ms, 1 s, $L_{eq}$ 1s $L_{eq}$ 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).  
This leaflet is printed with environmentally friendly vegetable-based ink on recycled paper.

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

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



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

## 校准证书 CALIBRATION CERTIFICATE

证书编号: 2HB21001383-0001  
Certificate No.



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

校准:  
Calibrated by **陈卓辉**

签发:  
Approved by **郑木力**

检验:  
Inspected by **张毅**

印章:  
Stamp

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

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

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

## 说明 DIRECTIONS

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

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

# Calibration Certificate of Sound Level Meter



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

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

无影响证书中测量结果准确度的因素和缺陷。

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

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

频率(Frequency)=1000Hz

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

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

### 3 级线性 (Level Linearity)

#### 3.1 参考级量程 (Reference Range)

频率(Frequency): 8000Hz

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

#### 3.2 其它级量程 (Other Range)

频率(Frequency): 1000Hz

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

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

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

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

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## Calibration Certificate of Sound Level Meter



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

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

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

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

### 6 自生噪声 (Autogenous noise)

计权 (Weighting)	实测值 (Actual)
A	15.3

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# Calibration Certificate of Sound Level Meter



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

## 校准证书 CALIBRATION CERTIFICATE

证书编号: 2HB21001370-0002  
Certificate No. 



委托单位: Castco Testing Centre Limited  
Client  
仪器名称: Sound Level Meter  
Description  
型号规格: NL-52  
Model/Type  
制造商: RION  
Manufacturer  
机身号: 00976204  
Serial No.  
管理号: AAST-SLM-11  
Asset No.  
接收日期: 2021-07-08 校准日期: 2021-07-19  
Rec. Date Cal. Date  
签发日期: 2021-07-19 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

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

核校: 张毅  
Inspected by  
印章:  
Stamp

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

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

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证书编号(Certificate No.): 2HB21001370-0002

## 说明 DIRECTIONS

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

2. 本次校准的技术依据及CNAS认可范围(Reference documents and CNAS accredited scopes):  
\* JJG 188-2017 声级计检定规程: Sound pressure level: (20~130)dB; Frequency Weighting: (20~130)dB@(10 Hz~20kHz).  
\* 详细内容请查看CNAS网站中注册编号为L13344的证书附件, 超出范围的内容未被认可, 其结果/结论所依据的合格评定活动不在认可范围内。(Please see the attachment of certificate No. L13344 at CNAS website for details, beyond which is not accredited, the conformity assessment activities on which the results/conclusions are based are outside the scope of accreditation.)

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

(Description)	(Certificate No./Due Date/Traceability to)	(Specification)	(Measuring Range)
正弦信号发生器	4GC20000427-0010/2021-11-04/赛宝(广州)	f: ±1mHz; 失真度: <-70dB	f: 0.001Hz~200kHz; U: 100V~5Vrms
数字多用表	4GC20000358-0060/2021-09-09/赛宝(广州)	DCV: ±0.0035%; ACV: ±0.06%; DCI: ±0.05%; ACI: ±0.1%; R: ±0.01%; f: ±0.001%	(0.001~750)V@(3Hz~300kHz); DCI(0~3A); ACI(0~3)A@(3Hz~5kHz); R(0~100)MΩ; f: 3Hz~300kHz
步进衰减器	4GC21000155-0024/2022-04-29/赛宝(广州)	±3dB	(0~110) dB/10dB step @DC~1GHz
PULSE分析系统	GFJGJL1001210202725/2022-03-03/航空304所	频率: $U_{100} = 0.001\% k=2$ ; 电压: $U_{100} = 0.04\% k=2$	频率: 0.001Hz~51.2kHz; 电压: (1×10 <sup>-3</sup> ~30)V
标准传声器	LSsx2021-13180/2022-04-24/中国计量院	$U = (0.05 - 0.20)dB (k=2)$	20Hz~20kHz
前置放大器	LSsx2021-11346/2022-03-07/中国计量院	$U = 0.3dB (k=2)$	(10~20000) Hz
功率放大器	4GC20000457-0065/2021-11-17/赛宝(广州)	频率响应: ±1dB; 失真度: ≤0.2%	20Hz~20kHz
多功能声学校准器	4EC20000091-0005/2021-11-05/赛宝(广州)	1级	31.5Hz~16kHz

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

5. 环境条件(Environmental conditions):  
温度(Temperature): 23.4°C 相对湿度(Relative Humidity): 55.8%


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

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

8. 建议校准周期是本实验室依据本证书报告的技术依据和仪器设备常规使用条件给出的建议, 供委托方参考。委托方可以根据实际使用情况自行决定样品的校准周期。

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# Calibration Certificate of Sound Level Meter


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

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

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

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

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

3 级线性 (Level Linearity)

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

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

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

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

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

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

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

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


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

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

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

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

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

4 A计权特性(A-Weighting Characteristic)

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

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## Calibration Certificate of Sound Level Meter



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

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

频率 (Frequency)	实测值 (Actual)	理论值 (Theoretical value)	误差 (Error)	允许误差 (Limit)	结论 (Pass/Fail)	U (k=2)
20	-6.3	-6.2	-0.1	±2.0	P	0.5
25	-4.5	-4.4	-0.1	+2.0 ~ -1.5	P	0.5
31.5	-3.2	-3.0	-0.2	±1.5	P	0.5
40	-2.0	-2.0	0.0	±1.0	P	0.5
50	-1.4	-1.3	-0.1	±1.0	P	0.5
63	-0.8	-0.8	0.0	±1.0	P	0.5
80	-0.5	-0.5	0.0	±1.0	P	0.5
100	-0.3	-0.3	0.0	±1.0	P	0.5
125	-0.2	-0.2	0.0	±1.0	P	0.5
160	-0.1	-0.1	0.0	±1.0	P	0.5
200	0.0	0.0	0.0	±1.0	P	0.5
250	0.0	0.0	0.0	±1.0	P	0.5
315	0.0	0.0	0.0	±1.0	P	0.4
400	0.0	0.0	0.0	±1.0	P	0.4
500	0.0	0.0	0.0	±1.0	P	0.4
630	0.0	0.0	0.0	±1.0	P	0.4
800	0.0	0.0	0.0	±1.0	P	0.4
1000(Ref.)	0.0	0.0	0.0	±0.7	P	0.4
1250	0.0	0.0	0.0	±1.0	P	0.6
1600	-0.1	-0.1	0.0	±1.0	P	0.6
2000	-0.2	-0.2	0.0	±1.0	P	0.6
2500	-0.3	-0.3	0.0	±1.0	P	0.6
3150	-0.5	-0.5	0.0	±1.0	P	0.6
4000	-0.8	-0.8	0.0	±1.0	P	0.6
5000	-1.2	-1.3	0.1	±1.5	P	0.6
6300	-1.9	-2.0	0.1	+1.5 ~ -2.0	P	0.6
8000	-2.9	-3.0	0.1	+1.5 ~ -2.5	P	0.6
10000	-4.3	-4.4	0.1	+2.0 ~ -3.0	P	0.6
12500	-6.4	-6.2	-0.2	+2.0 ~ -5.0	P	1.0
16000	-9.9	-8.5	-1.4	+2.5 ~ -16.0	P	1.0
20000	-16.2	-11.2	-5.0	+3.0 ~ ∞	P	1.0

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

### 6 自生噪声 (Autogenous noise)

计权 (Weighting)	实测值 (Actual)
A	18.3

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## Catalogue of Sound Calibrator

Sound Calibrator NC-75



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

# Sound Calibrator NC-75

Patent pending



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

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

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

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

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

JCSS Calibration Certificate



JCSS Calibration Results



## Catalogue of Sound Calibrator



How to use the adapter

### 1-inch microphones

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



### 1/2-inch microphones

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



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

### 1/4-inch microphones

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



Usage example

Specifications (under standard ambient conditions\*)

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

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

Optional accessories: 1/4-inch microphone adapter NC-75-S11

Strap



Securely carry the unit with the supplied hand strap

Soft case



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

### PISTONPHONE NC-72A



Specifications (under standard ambient conditions\*)

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



JCSS  
JCSS 6197

RION CO., LTD. is recognized by the JCSS which uses ISO/IEC 17025 as an accreditation standard and bases its accreditation scheme on ISO/IEC 17031. JCSS is operated by the accreditation body (UKAS which is a signatory to ILAC), The Quality Assurance Section of RION CO., LTD. is an international ILAC compliant JCSS operator with the accreditation number JCSS 0187.

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

Distributed by:

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

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

This product is environment-friendly. It does not include toxic chemicals on our policy.  
This leaflet is printed with environmentally friendly UV ink.

1709-5 1910/PD



# Catalogue of Sound Calibrator

For microphone calibration **NC-74**

### How to use

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

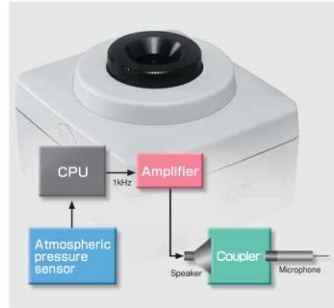


Usage example (NL series)

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

### Atmospheric pressure compensation principle

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



### Using the 1/2-inch adapter

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



### Specifications

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

\* Specification subject to change without notice.

**RION CO., LTD.**

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

Distributed by:



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

Printed in Japan 0510-1 0807.P.MP

# Calibration Certificate of Sound Calibrator



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

## 校准证书 CALIBRATION CERTIFICATE

证书编号: 2HB21001749-0002  
Certificate No.



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

校准: 赵文钰  
Calibrated by

核校: 张毅  
Inspected by

签发: 郑木方  
Approved by

印章: Stamp

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

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

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# Calibration Certificate of Sound Calibrator

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

## 说明 DIRECTIONS

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

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

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

名称 (Description)	证书号/有效期/溯源单位 (Certificate No./Due Date/Traceability to)	技术指标 (Specification)	测量范围 (Measuring Range)
标准传声器	LSs2021-13180/2022-04-24/中国计量院	$U=(0.05-0.20)$ dB ( $k=2$ )	10Hz~20kHz
PULSE分析系统	4GC21000026-0375/2022-01-21/赛宝(广州)	频率: $U_{cp}=0.001\%$ $k=2$ ;电压: $U_{cp}=0.04\%$ $k=2$	频率:0.001Hz~51.2kHz
前置放大器	LSs2021-13000/2022-04-19/中国计量院	$U=0.3$ dB ( $k=2$ )	(10~50000) Hz

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

5. 环境条件(Environmental conditions):  
温度(Temperature): 22.9°C 相对湿度(Relative Humidity): 59.5%

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

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

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

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

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

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

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

无影响证书中校准结果准确度的因素和缺陷。

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

2 声压级 (Sound Pressure Level)

规定声压级 (Prescribed SPL)	测量声压级 (Measured SPL)	声压级差的绝对值 (Absolute value of SPL)	允许范围 (Limit)	结论 (Pass/Fail)	$U$ (dB)
(dB)	(dB)	(dB)	(dB)		( $k=2$ )
94	94.12	0.12	≤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)	$U_{rel}$ (%)
(Hz)	(Hz)	(%)	(%)		(%)
1000	1000.0	0.00	≤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)	$U_{rel}$ (%)
(dB)	(Hz)	(%)	(%)		(%)
94	1000	0.15	≤3.00	P	5.0

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# Calibration Certificate of Sound Calibrator

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



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

## 校准证书 CALIBRATION CERTIFICATE

证书编号: 2HB21001370-0004  
Certificate No.



委托单位: Client	Castco Testing Centre Limited		
仪器名称: Description	Sound Level Calibrator		
型号规格: Model/Type	NC-74		
制造商: Manufacturer	RION		
机身号: Serial No.	34178129		
管理号: Asset No.	AAST-SLC-05		
接收日期: Rec. Date	2021-07-08	校准日期: Cal. Date	2021-07-19
签发日期: App. Date	2021-07-19	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: 广州市增城区朱村街朱村大道西78号  
客服电话: 020-87237633 传真: 020-87236189  
投诉电话: 020-87236896  
邮件: cal@ceprei.com  
网址: www.ceprei-cal.com

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

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

## 说明 DIRECTIONS

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

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

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

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

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

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

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

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

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

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

# Calibration Certificate of Sound Calibrator



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

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

无影响证书中校准结果准确度的因素和缺陷。

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

## 2 声压级 (Sound Pressure Level)

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

## 3 频率 (Frequency)

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

## 4 总失真 (Distortion)

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

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数据页(Data sheet) ID: 013393

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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.)
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#### 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.

TSI and the TSI logo are registered trademarks, and Airflow, the Airflow logo and LogDat2 are trademarks of TSI Incorporated.



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 Models 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.



## 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 \_\_\_\_\_

(证书专用章)  
Stamp

该二维码非公众号



扫码获证书信息(黄色)

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

- 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

- 校准地点: 本公司力学实验室  
Operation Location

- 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

- 1、外观及工作正常性检查: 正常
- 2、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):

- 1、本次测量结果的不确定度 (k=2)。  
The uncertainty of the measurement result (k=2).
- 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.
- 3、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

扫码查证书信息 (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	$U=0.03\text{°C}, k=2$	2-204	深圳市计量质量检测研 究院 205502058	2022-03-09

- 校准地点: 本公司力学实验室  
Operation Location
- 环境条件: 温度 21.7 °C 相对湿度 60% 大气压 1010.0 hPa  
Operation Environment Temperature RH



**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**



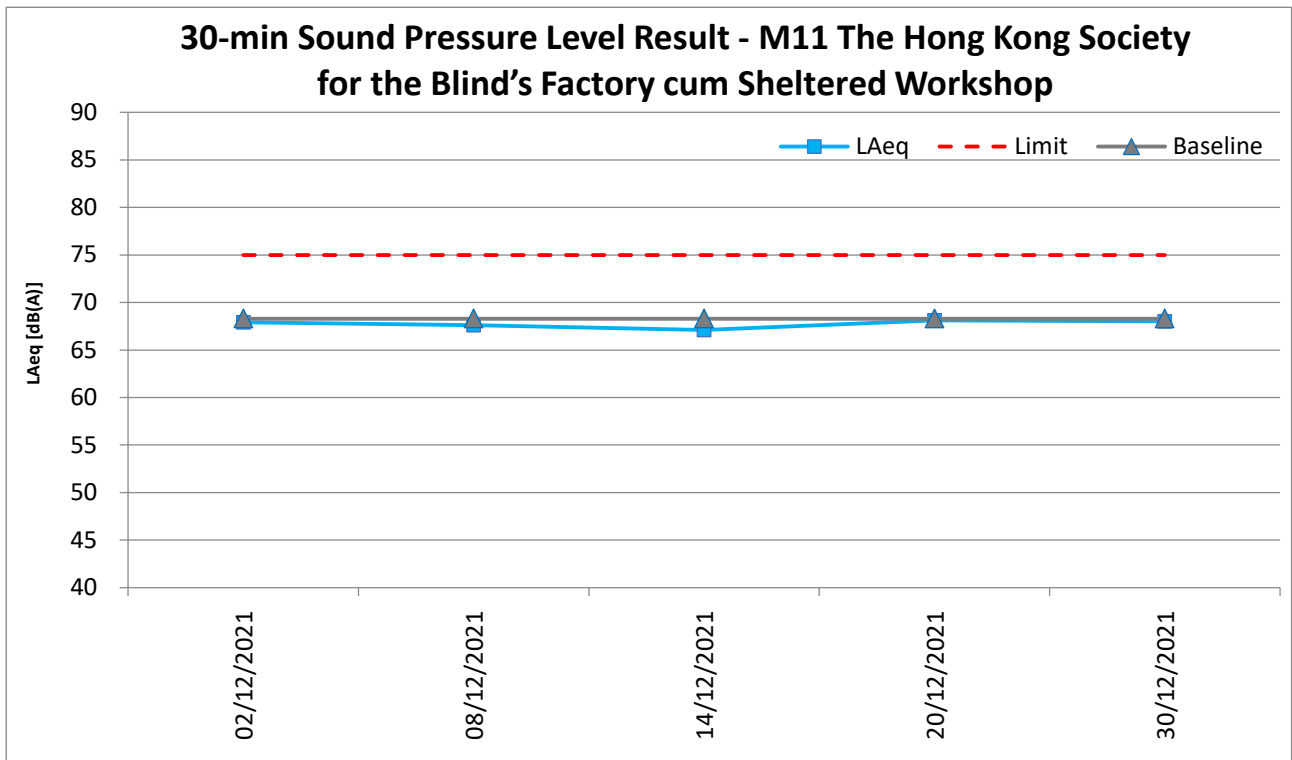
**M11 - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop**

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>		
02/12/2021	22.3	Sunny	14:12	-	14:42	68.3	67.9	70.7	61.9	75
08/12/2021	21.8	Sunny	10:30	-	11:00	68.3	67.6	70.4	62.4	75
14/12/2021	18.0	Sunny	10:05	-	10:35	68.3	67.1	70.4	60.5	75
20/12/2021	19.6	Cloudy	14:25	-	14:55	68.3	68.1	70.7	63.1	75
30/12/2021	16.0	Sunny	9:27	-	9:57	68.3	68.0	71.1	62.5	75
Maximum							68.1			
Minimum							67.1			
Average							67.8			

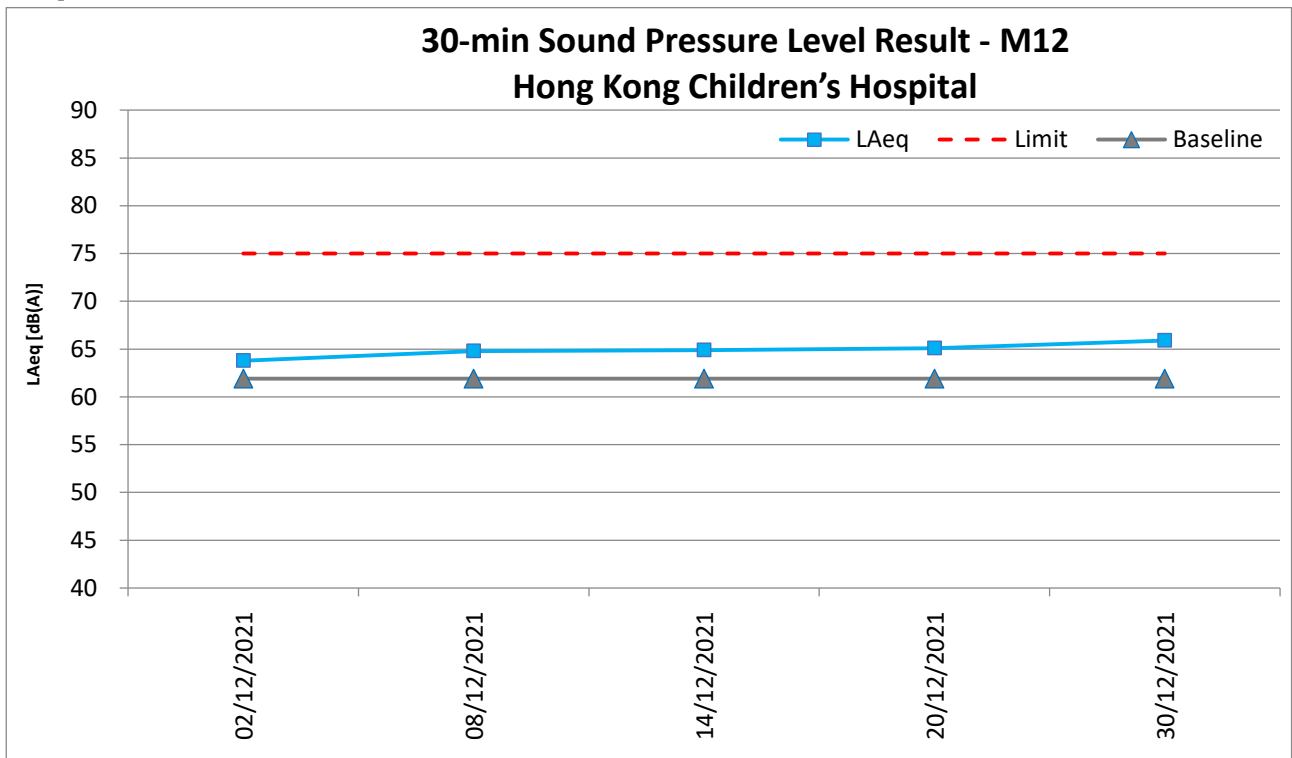
**M12 - Hong Kong Children's Hospital**

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>		
02/12/2021	22.3	Sunny	13:49	-	14:19	61.9	63.8	65.4	62.1	75
08/12/2021	21.8	Sunny	11:02	-	11:32	61.9	64.8	67.0	61.9	75
14/12/2021	18.0	Sunny	14:17	-	14:47	61.9	64.9	66.6	62.4	75
20/12/2021	19.6	Cloudy	10:54	-	11:24	61.9	65.1	67.2	62.3	75
30/12/2021	16.0	Sunny	13:22	-	13:52	61.9	65.9	68.1	62.9	75
Maximum							65.9			
Minimum							63.8			
Average							65.0			

**$L_{Aeq, 30\text{-min}}$  graphical results of M11 - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop**



**$L_{Aeq, 30\text{-min}}$  graphical results of M12 - Hong Kong Children's Hospital**



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

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

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

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

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

**Appendix N – Waste Flow Table**



## Appendix F - Monthly Summary Waste Flow Table

Name of Department: CEDD

Contract No.: ED/2018/01

**Monthly Summary Waste Flow Table for December 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	4.780	--	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	10.791	--	0.680	9.411	0.700	--	--	--	--	--	0.140
<b>Sub-total</b>	<b>47.448</b>	<b>0.304</b>	<b>7.495</b>	<b>29.25</b>	<b>9.729</b>	<b>0.670</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>0.696</b>
July	0.474	--	--	0.255	0.219	--	--	--	--	--	0.119
Aug	1.81	--	--	0.435	1.375	--	--	0.107	--	--	0.174
Sep	9.707	1.673	2.573	4.702	0.431	0.328	0.002	0.050	0.005	--	0.128
Oct	3.441	--	0.380	2.150	0.911	--	--	--	3.680	--	0.169
Nov	3.390	--	--	2.831	0.559	--	0.002	0.041	0.007	--	0.196
Dec	4.803	--	0.866	3.442	0.285	0.210	--	--	--	--	0.168
<b>Total</b>	<b>71.073</b>	<b>1.977</b>	<b>11.314</b>	<b>43.065</b>	<b>13.509</b>	<b>1.208</b>	<b>0.004</b>	<b>0.198</b>	<b>3.692</b>	<b>--</b>	<b>1.65</b>
Forecast of Total Quantities of C&D Materials to be Generated from the Contract*											
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse	
(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )	
<b>195.01</b>	<b>2.103</b>	<b>10.2</b>	<b>140</b>	<b>19.81</b>	<b>25</b>	<b>200</b>	<b>0.8</b>	<b>0.1</b>	<b>--</b>	<b>3.4</b>	

- Notes: (1) The performance targets are given in **ER Appendix 81 Clause 14** and the EM&A Manual  
(2) The waste flow table shall also include C&D materials to be imported for use at the Site  
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material and water barrier  
(4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000m<sup>3</sup> (**ER Part 8 Clause 8.7.5(d)(ii)** refers)  
(5) Assume inert C&D materials density and non-inert C&D materials are 1.9 m<sup>3</sup>/ton and 1.5 m<sup>3</sup>/ton

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

<b>Implementation Schedule for Air Quality Measures</b>			
<b>EIA for KTD Development Ref.</b>	<b>EIA for KTD – Roads D3A &amp; D4A Ref.</b>	<b>Environmental Protection Measures / Mitigation Measures</b>	<b>Status</b>
S3.2		8 times daily watering of the work site with active dust emitting activities.	^
S3.2	S4.8	Implementation of dust suppression measures stipulated in Air Pollution Control (Construction Dust) Regulation. The following mitigation measures, good site practices and a comprehensive dust monitoring and audit programme are recommended to minimize cumulative dust impacts.	^
		- Stockpiling site(s) should be lined with impermeable sheeting and bunded. Stockpiles should be fully covered by impermeable sheeting to reduce dust emission.	^
		- Misting for the dusty material should be carried out before being loaded into the vehicle.	^
		- Any vehicle with an open load carrying area should have properly fitted side and tail boards.	^
		- Material having the potential to create dust should not be loaded from a level higher than the side and tail boards and should be dampened and covered by a clean tarpaulin.	^
		- The tarpaulin should be properly secured and should extend 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		<p><u>Chemical Waste</u></p> <p>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.</p>	^
	S6.7	Separation of chemical wastes for special handling and appropriate treatment.	^
S3.5		<p><u>General Refuse</u></p> <p>General refuse should be stored in enclosed bins or compaction units separate from C&amp;D material. A licensed waste collector should be employed by the contractor to remove general refuse from the site, separately from C&amp;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.</p>	^

<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	<p><u>Construction Site Control</u></p> <ul style="list-style-type: none"> <li>- CM1 - Minimized construction area and contractor's temporary works areas.</li> </ul>	^
		<ul style="list-style-type: none"> <li>- CM2- Control of night-time lighting and glare by hooding all lights.</li> </ul>	^
		<ul style="list-style-type: none"> <li>- CM3 - Erection of decorative mesh screens or construction</li> </ul>	^

<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:	02 December 2021	Date:	09 December 2021
Mitigation Measures:	Quiet PME was used.	Mitigation Measures:	The open stockpiles of construction materials on sites were covered
			
Date:	23 December 2021	Date:	30 December 2021
Mitigation Measures:	Haul road was sprayed with water to maintain the entire road surface wet.	Mitigation Measures:	Manholes have been adequately covered and temporarily sealed.

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



**Reporting Month: December 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	Yes	No	No

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

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

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

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

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

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## Appendix D

### Monthly EM&A Report For

Contract No. ED/2018/05

Kai Tak Development – Stage 5B infrastructure works at the former north apron area

**Environmental Monitoring and Audit Report**  
**for**  
**Contract No. ED/2018/05 –**  
**Kai Tak Development – Stage 5B infrastructure**  
**works at the former north apron area**

**Contract No.: EDO 2/2020**

December 2021

(Version 1.1)

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

(Environmental Team Leader)



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SUSTAINABILITY  
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Tel. : (852) 2698 6833  
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Date: 14 January 2022  
Your ref:  
Our ref: PL-202201029

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

**Attn.: Mr. LEUNG Wai Kit, CRE**

Dear Mr. Leung,

**Re: Agreement No. EDO 6/2019  
Independent Environmental Checker for Contract No. ED/2018/05 Kai Tak  
Development – Stage 5B Infrastructure works at the Former North Apron Area  
Verification of Monthly EM&A Report (December 2021)**

Reference is made to the Monthly EM&A Report (December 2021) (Version 1.1) provided by the Environmental Team on 14 January 2022.

Please be informed that we have no adverse comment on the captioned submission. We hereby verify the Monthly EM&A Report (December 2022) in accordance with Condition 3.3 of Environmental Permit No. EP-337/2009.

Thank you for your attention.

Yours sincerely,  
For and on behalf of  
Acuity Sustainability Consulting Limited

Kevin Li  
Independent Environmental Checker

c.c. CEDD  
Ka Shing

Attn.: Mr. Kinox Wong  
Attn.: Mr. Chan Pang (ETL)

By email  
By email

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## EXECUTIVE SUMMARY

1. This is the 11<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 December 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 compliant	Description of complaint	Recommendations / Action take	Close-out date / Status
N/A	N/A	N/A	N/A	N/A

### **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 taken	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 undertake during the reporting month included:
- Underground utility diversion works and pillar box relocation works at Sa Po Road
  - Bored pile works for landscape elevated walkway LW-02
  - Sheetpile installation at launching shaft for subway SB-01
  - Drainage works for Pedestrian Street No. 1, No. 2 & No. 3
  - Construction of Crowd Dispersal Route
  - Twin rising mains diversion 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
Advance works for traffic diversion at Sa Po Road	Noise and Air Quality
Bored pile works for landscape elevated walkway	Noise and Air Quality
Pre-drilling work for S14	Noise and Air Quality
Drainage works for Pedestrian Street No. 1, No. 2 & No.3	Noise and Air Quality
Construction of Crowd Dispersal Route	Noise and Air Quality
Rising main construction	Noise and Air Quality
Sheetpile installation for launching shaft of SB-01	Noise and Air Quality

# 1. INTRODUCTION

## Project Background

- 1.1 The Kai Tak Development (KTD) is located in the southern 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/2018/05 - Kai Tak Development – stage 5B infrastructure works at the former north apron area (The Project), comprises mainly the design and construction of a section of dual two-lane Road D1; single two-lane Road L9 and Road L16; a single-lane slip road S14; a pedestrian subway SB-01; an elevated walkway LW-02; renovation of the existing pedestrian subways KS9, KS10 and KS32, as well as modification of the southern end of the existing pedestrian subway KS10; associated footpaths, street lighting, traffic aids, drainage, sewerage, water mains, landscaping, electrical and mechanical works, and ancillary works. The proposed works are shown in Figure 1 and Figure 2. The proposed works and site boundary are shown in Figure 3 and Figure 4. Civil Engineering and Development Department (CEDD) had completed an Environmental Impact Assessment (EIA) and is the Permit Holder.
- 1.3 In accordance with the approved EIA Reports, Environmental Monitoring and Audit (EM&A) programmes are recommended to ensure compliance with the EIA study recommendations. The project proponent was the Civil Engineering and Development Department (CEDD). AECOM Asia Co. Ltd. (AECOM) was commissioned by CEDD as Supervisor (act as Engineers' Representative (ER) listed in EM&A Manual). Acuity Sustainability Consulting Limited (Acuity) was commissioned as the Independent Environmental Checker (IEC). Build King – STEC Joint Venture (Build King) was appointed as the main Contractor for the construction works of Contract No. ED/2018/05. Ka Shing was commissioned by CEDD to undertake the role of the Environmental Team (ET) to implement the EM&A programme for The Project.
- 1.4 The construction work under ED/2018/05 comprises the EM&A Manual (EIA Register No. AEIAR-130/2009 for Kai Tak Development) and Environmental Permit No. EP- 337/2009.
- 1.5 Air quality and noise monitoring has been proposed in the EM&A Manual with EIA Register No. AEIAR-130/2009 for Kai Tak Development.

## **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. George Ng	Senior Engineer	3842 7107	2739 0076
		Mr. Albert Tse	Engineer	3842 7137	2739 0076
		Mr. Perry Lo	Engineer	3842 7143	2739 0076
AECOM Asia Co. Ltd. (AECOM)	Supervisor (act as Engineers' Representative (ER) listed in EM&A Manual)	Mr. Leung Wai Kit	CRE	2412 3410	2798 0783
Acuity Sustainability Consulting Limited (Acuity)	Independent Environmental Checker (IEC)	Mr. Kevin Li	IEC	2698 6833	2698 9383
Ka Shing Management Consultant Limited (Ka Shing)	Environmental Team (ET)	Ir. Chan Pang	ET Leader	2618 2166	2120 7752
Build King – STEC Joint Venture (BK-STECC)	Contractor	Mr. Raymond Lam	Environmental Officer	9713 6817	3850 8508

## **Works Area and Construction Programme**

1.7 The construction works commenced on 16 February 2021. 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*

Underground utility diversion works and pillar box relocation works at Sa Po Road	Twin rising mains diversion works
Bored pile works for landscape elevated walkway LW-02	
Sheetpile installation at launching shaft for subway SB-01	
Drainage works for Pedestrian Street No. 1, No. 2 & No. 3	
Construction of Crowd Dispersal Route	

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

1.9 The status of required submission under Environmental Permit (EP) conditions under EP-337/2009 are summarized in Table 1.3.

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

EP Condition EP-337/2009	Submission	Submission Date
Condition 1.11	Notification of Commencement Date of Construction of the Project	12 Jan 2021
Condition 2.3	Management Organization of Main Construction Companies	21 Sep 2020
Condition 2.4	Design Drawings	12 Jan 2021
Condition 2.11	Landscape Mitigation Plans	17 Dec 2020
Condition 3.2	Baseline Monitoring Report	12 Jan 2021
Condition 3.2	Monthly EM&A Report	14 December 2021

## 2. AIR QUALITY MONITORING

### Monitoring Requirements

2.1 In accordance with EM&A Manual (EIA Register No. 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 Two designated monitoring stations were selected for air quality monitoring programme. Impact air quality monitoring was conducted at two 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
AM2(A) – Ng Wah Catholic Secondary School	Rooftop
AM3 – Sky Tower	Podium floor near T7

### 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
AM2(A) – Ng Wah Catholic Secondary School	Rooftop	- 24-hour average TSP	- 24 hours	- Once every 6 days
AM3 – Sky Tower	Podium Floor near Tower 7	- 1-hour average TSP	- 1 hour	- Three times every 6 days

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	Calibration Interval
HVS Sampler	TE-5170 X c/w of TSP sampling inlet	4	2 months
HVS Calibrator	TISCH TE-5025A	1	1 year
1-hour TSP Dust Meter	TSI Model AM510 SidePak Personal Aerosol Monitor	2	1 year
Weather Station	Davis Vantage Pro2 Weather Station	1	6 months

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

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

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

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

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

2.9 Setup criteria of HVS are shown as follows:

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

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

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

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

2.13 The filter holding frame was removed by loosening the four nuts and a weighted and conditioned filter was carefully centered with the stamped number upwards, on a supporting screen.

2.14 The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts. The applied pressure was sufficient to avoid air leakage at the edges.

2.15 The shelter lid was closed and secured with the aluminium strip.

2.16 The timer was programmed. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).

2.17 After sampling, the filter was removed from the HVS and put into a clean and labeled seal plastic bag to avoid cross contamination. The elapsed time was also be recorded. The sampled filters were sent to the HOKLAS accredited or other internationally accredited laboratory for weighting.

#### Maintenance/Calibration

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

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

#### *1-hour TSP Monitoring*

#### Measurement Procedures

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

- Set up the dust meter on a tripod at 1.2m level.
- Turned on the dust meter and check the battery, if too low, change new ones. Pointed the meter to the source area or the planned measurement area.
- The zero calibration of the instrument was conducted before and after each sampling.
- TSP levels were recorded for 1-hour with 5-minute data logging interval.
- Recorded down the general meteorological conditions, Test ID no., start/end time, spot check reading at each sampling location for data processing.
- Recorded any activities that may generate dust during measurement period.

#### Maintenance/Calibration

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

- To validate the accuracy of dust meter, compare the results measured by dust meter and HVS 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 AM2(A) – Ng Wah Catholic Secondary School 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	AM2(A)	175	260
	AM3	172	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	AM2(A)	302	500
	AM3	301	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, $\mu\text{g}/\text{m}^3$
AM2(A)	72	25-104	175	260
AM3	75	26-93	172	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, $\mu\text{g}/\text{m}^3$
AM2(A)	54	20-88	302	500
AM3	56	21-82	301	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.

2.32 Weather conditions during the monitoring periods were generally fine and did not affect the monitoring results.

### 3. NOISE MONITORING

#### Monitoring Requirements

- 3.1 In accordance with EM&A Manual (EIA Register No. 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 hrs on normal weekdays.
- 3.3 If construction works are extended to include works during 1900 – 0700 hrs 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
M4(A) – Le Billionnaire	Podium (Façade)
M5(A) – Prince Ritz	Podium (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
M4(A) – Le Billionnaire	Podium (Façade)	L <sub>Aeq</sub> , L <sub>A10</sub> and L <sub>A90</sub>	30-minute measurement at each monitoring station between 0700 – 1900 hrs on normal weekdays (Monday to Saturday) at frequency of once per week.
M5(A) – Prince Ritz	Podium (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 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	Calibration Interval
Sound Level Meter	RION NL52	2	1 year
Sound Level Calibrator	RION NC 75	1	1 year
Air Flow meter	TSI TA440 Air Velocity	1	1 year

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 of the sound level meter and calibrator were cleaned with a soft cloth at quarterly intervals.

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

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

### **Action and Limit Levels**

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

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

Time Period	Noise Monitoring Station	Baseline Noise Levels, dB (A)	Action Level	Limit Level <sup>^</sup>
0700 – 1900 hrs on normal weekdays	M4(A)	69.5	When one documented complaint is received.	75 dB(A)
	M5(A)	72.5		

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 designated noise monitoring stations are summarized in Table 3.5 respectively.

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

Noise Monitoring Station	Measured $L_{Aeq, 30-min}$ , Average, dB(A)	Measured $L_{Aeq, 30-min}$ , Range, dB(A)	Action Level	Limit Level <sup>^</sup>
M4(A)	70.0	69.4 – 71.0	When one documented complaint is received	75 dB(A)
M5(A)	73.0	72.2 – 74.5		

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

3.21 There was no Action and Limit Level exceedance of  $L_{Aeq, 30-min}$  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.

3.25 Weather conditions during the monitoring periods were generally fine and did not 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 No. 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 (Dec 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), $\mu\text{g}/\text{m}^3$	
AM2(A) - Ng Wah Catholic Secondary School	NA	NA	NA	25-104
AM3 - Sky Tower	A40 <sup>^</sup>	106 <sup>^</sup>	138 <sup>^</sup>	26-93

Note:

<sup>^</sup> Prediction results are given in the Table 3.13 of the EIA report EIA Register No. 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 (Dec 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), $\mu\text{g}/\text{m}^3$	
AM2(A) - Ng Wah Catholic Secondary School	NA	NA	NA	20-88
AM3 - Sky Tower	A40 <sup>^</sup>	217 <sup>^</sup>	247 <sup>^</sup>	21-82

Note:

<sup>^</sup> Prediction results are given in the Table 3.13 of the EIA report EIA Register No. AEIAR-130/2009 for Kai Tak Development.

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

Noise Monitoring Station	NSR No. in EIA report	Predicted Mitigated Construction Noise Levels during Normal Daytime Working Hour L <sub>Aeq, 30min</sub> , dB(A)	Measured Noise Level in Reporting Month (Dec 2021) L <sub>Aeq, 30min</sub> , dB(A)
M4(A) – Le Billionnaire	NA	NA	69.4 – 71.0
M5(A) – Prince Ritz	NA	NA	72.2 – 74.5

- 4.2 No prediction in the EIA Report for 24-hour TSP monitoring results at AM2(A).
- 4.3 24-hour TSP monitoring results at AM3 was recorded lower than the prediction in the EIA Report.
- 4.4 No prediction in the EIA Report for 1-hour TSP monitoring results at AM2(A).
- 4.5 1-hour TSP monitoring results at AM3 was recorded lower than the prediction in the EIA Report.
- 4.6 No prediction in the EIA Report for noise monitoring results at M4(A) and M5(A).

## 5. LANDSCAPE AND VISUAL MONITORING

5.1 In accordance with EM&A Manual (EIA Register No. AEIAR-130/2009), Landscape and Visual Monitoring shall be carried out during the construction phase of the Project. Regular impact monitoring will be conducted at least once per week.

### **Results and Observations**

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

5.3 Site inspections were conducted on 2, 9, 17, 23 and 30 December 2021 in the reporting month.

5.4 The summary of site audits is attached in Table 5.1.

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

Inspection Date	Key Observations	Recommendations / Actions	Close-out Date / Status
2 December 2021	No	NA	NA
9 December 2021	No	NA	NA
17 December 2021	No	NA	NA
23 December 2021	No	NA	NA
30 December 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.







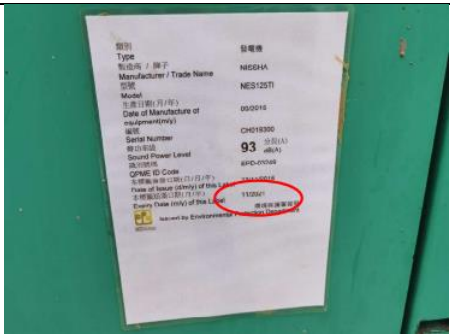

6.2 Site inspections were conducted on 2, 9, 17, 23 and 30 December 2021 in the reporting month.

6.3 The summaries of site audits are attached in Table 6.1.




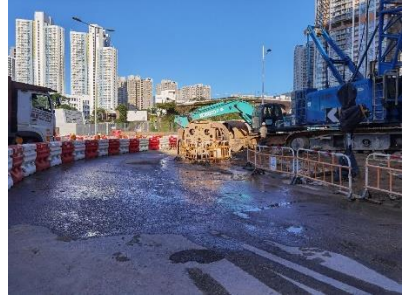
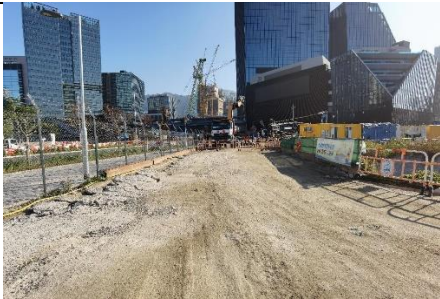

*Table 6.1 Summary of site inspections observations during the reporting month*

Inspection Date	Key Observations	Recommendations / Actions	Close-out Date / Status
2 December 2021	 <p>Observation: Stockpiles should be fully covered by impermeable sheeting to reduce dust emission.</p>	 <p>Action Taken: Stockpiles has been removed.</p>	Closed out on 9 December 2021
9 December 2021	 <p>Observation: Stockpiles should be fully covered by impermeable sheeting to reduce dust emission.</p>	 <p>Action Taken: Stockpiles has been removed</p>	Closed out on 17 December 2021



Inspection Date	Key Observations	Recommendations / Actions	Close-out Date / Status
9 December 2021	 <p>Observation: Secondary container shall be provided for the plastic diesel drum to prevent soil contamination in rising main.</p>	 <p>Observation: Plastic diesel drum has been removed.</p>	Closed out on 17 December 2021
	 <p>Observation: Chemical label was missed.</p>	 <p>Observation: Plastic diesel drum has been removed.</p>	Closed out on 17 December 2021
17 December 2021	 <p>Observation: Stockpiles should be fully covered by impermeable sheeting to reduce dust emission.</p>	 <p>Action Taken: Stockpiles has been removed.</p>	Closed out on 23 December 2021
			Closed out on 30 December 2021



Inspection Date	Key Observations	Recommendations / Actions	Close-out Date / Status
17 December 2021	Observation: An expired QPME label of the generator was observed in LW02.	Action Taken: An expired QPME label of the generator was observed in LW02.	
23 December 2021	 <p>Observation: An expired QPME label of the generator was observed in LW02.</p>	 <p>Action Taken: An expired QPME label of the generator was observed in LW02.</p>	Closed out on 30 December 2021
	 <p>Observation: Secondary container shall be provided for the diesel drum to prevent soil contamination in LW02.</p>	 <p>Action Taken: Diesel drum has been removed.</p>	Closed out on 30 December 2021
30 December 2021	 <p>Observation: Water spraying at the non-hard pave road at bored piles area shall be implemented at regular time interval.</p>	 <p>Action Taken: Water spraying at the non-hard pave road at bored piles area had been implemented at regular time.</p>	Closed out on 6 January 2022

## **Status of Waste Management**

- 6.4 The amount of wastes generated by the major site activities of the work contracts within the Project during the reporting month is shown in Appendix N.
- 6.5 The Contractor was registered as a chemical waste producer for the Project. The Contractor was reminded that chemical waste containers should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

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

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

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

Environmental Licenses, Notifications and Permits	Ref. No.	Valid From	Valid Till
Environmental Permit under EIAO	EP-337/2009	23 Apr 2009	N/A
Construction Dust Notification under APCO	HA/1826/1	29 Dec 2020	N/A
Waste Disposal Billing Account	7038086	21 Aug 2020	N/A
Registration as a Chemical Waste Producer	5111-286-B2596-01	15 Sep 2020	N/A
Wastewater Discharge License under WPCO	WT00037618-2021	29 March 2021	31 March 2026
	WT00037370-2021	29 March 2021	31 March 2026
	WT00038562-2021	15 July 2021	31 July 2026
Construction Noise Permit	GW-RE0973-21	12 Oct 2021	10 Dec 2021
	GW-RE1233-21	21 Dec 2021	10 March 2022
	GW-RE1262-21	22 Dec 2021	19 June 2022
	GW-RE1275-21	30 Dec 2021	19 June 2022

**Implementation Status of Environmental Mitigation Measures**

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

**Environmental Complaint and Non-compliance**

6.8 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	Recommendations / Action taken	Close-out date / Status
N/A	N/A	N/A	N/A	N/A

6.9 Complaint log is shown in Appendix P.

**Notifications of summons and successful prosecutions**

6.10 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 taken	Close-out date / Status
No notification of summons and successful prosecutions were received in	NA	NA	NA	NA

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

6.11 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 follows:

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

Future key issues in the coming month	Potential impact
Advance works for traffic diversion at Sa Po Road	Noise and Air Quality
Bored pile works for landscape elevated walkway	Noise and Air Quality
Pre-drilling work for S14	Noise and Air Quality
Drainage works for Pedestrian Street No. 1, No. 2 & No.3	Noise and Air Quality
Construction of Crowd Dispersal Route	Noise and Air Quality
Rising main construction	Noise and Air Quality
Sheetpile installation for launching shaft of SB-01	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.

7.3 The recommended environmental measures proposed in the EM&A Manual (EIA Register No. AEIAR-130/2009) shall be effectively implemented to minimize the potential environmental impacts. The Contractor is reminded to implement the mitigation measures properly.

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

7.4 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.
- 8.7 Based on the site inspection and audits, impact air quality and noise monitoring results, it was considered that the mitigation measures were effective to control the potential environmental impacts from the Project during the reporting period.

## Figures



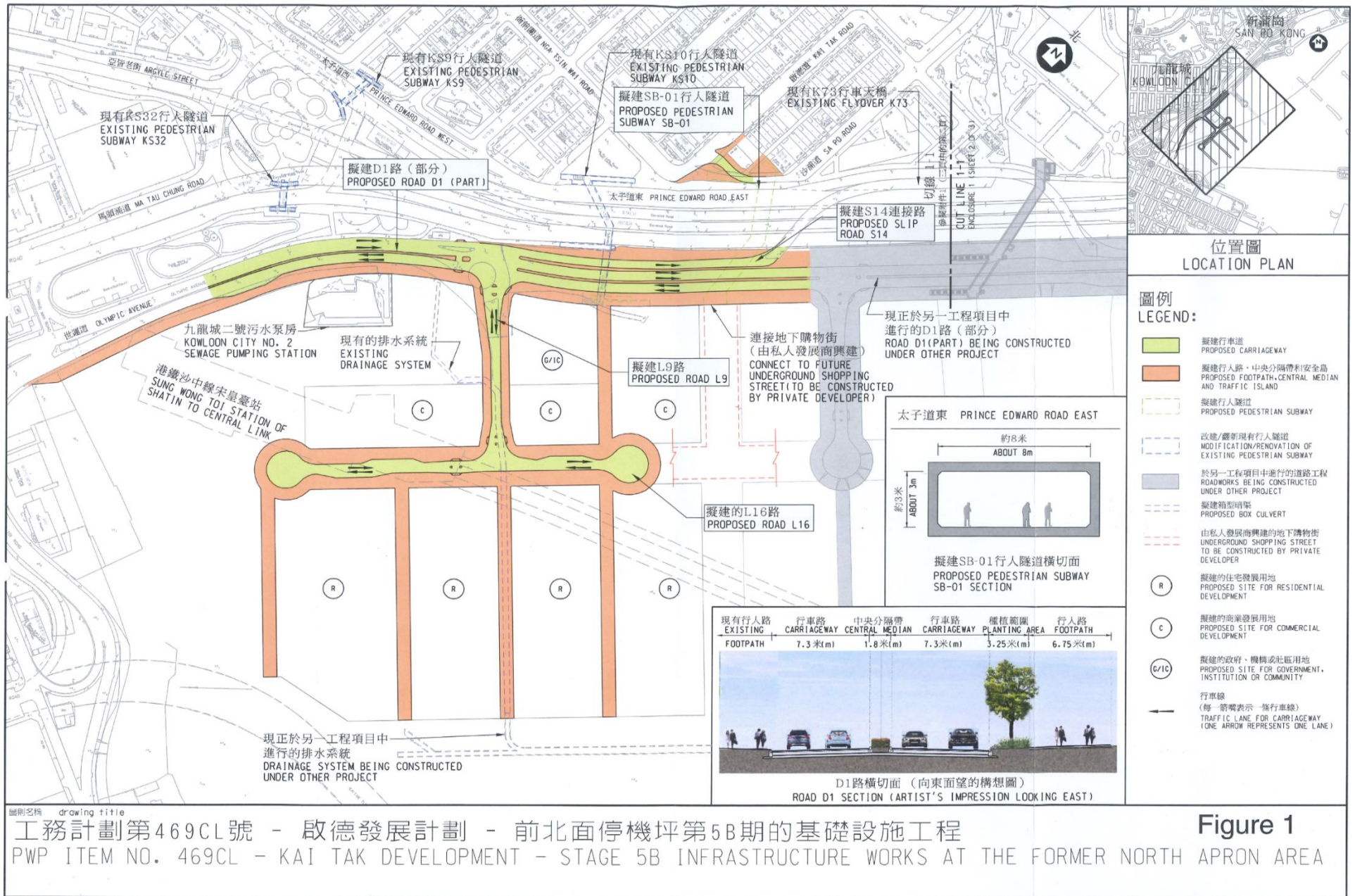


Figure 1 – Proposed works of Contract No. ED/2018/05



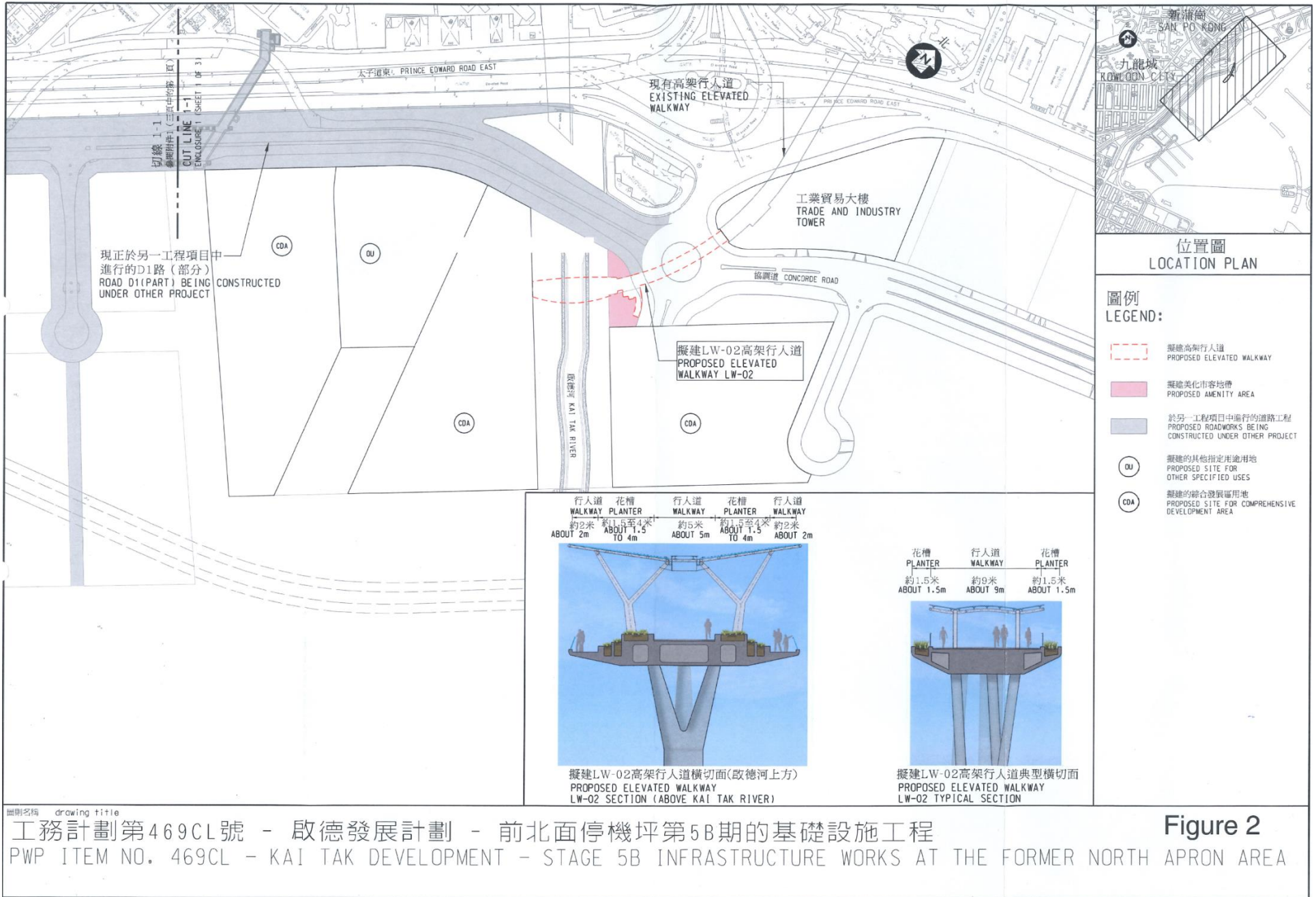


Figure 2

Figure 2 – Proposed works of Contract No. ED/2018/05

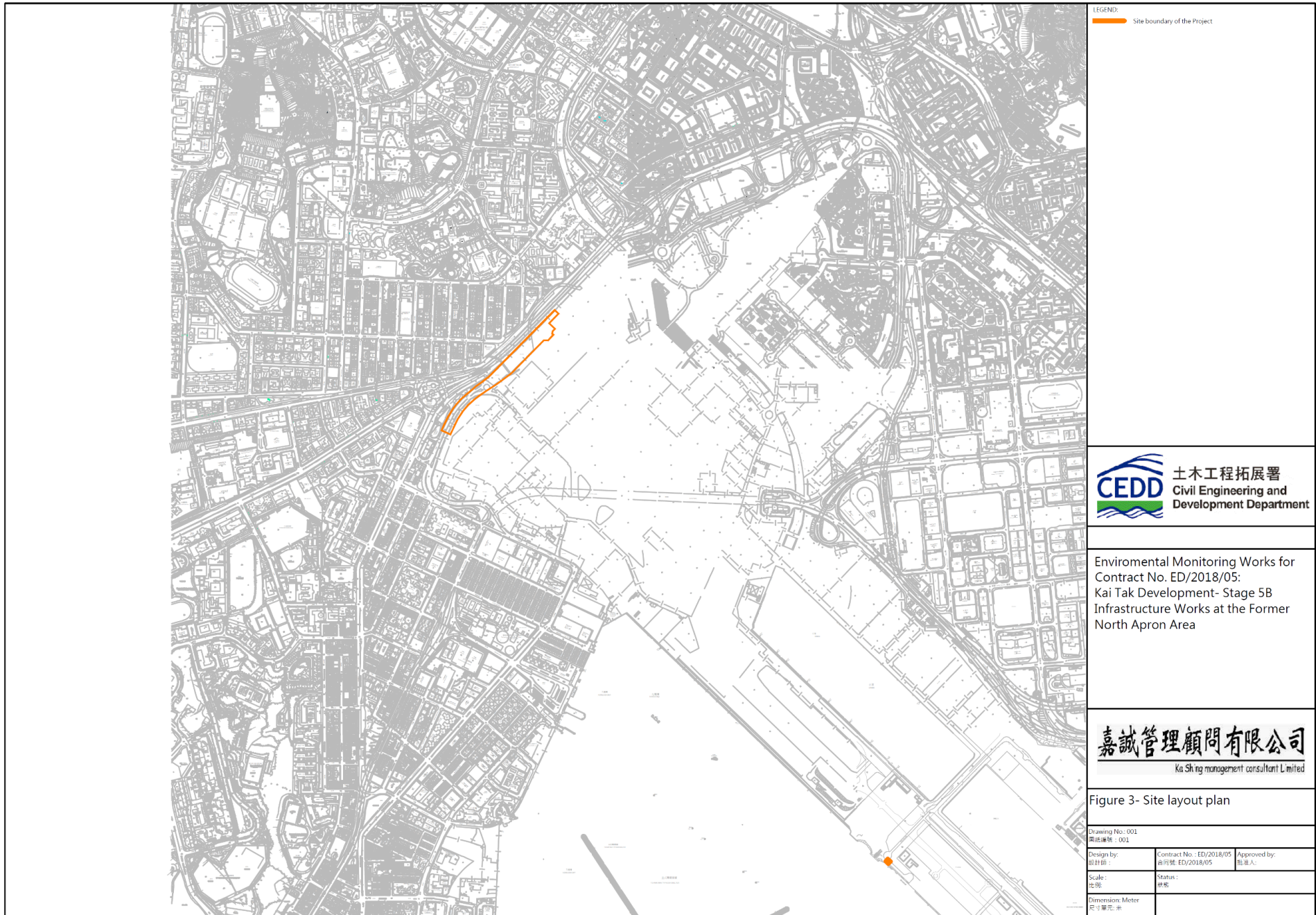


Figure 3 – D1 Road Site Layout Plan



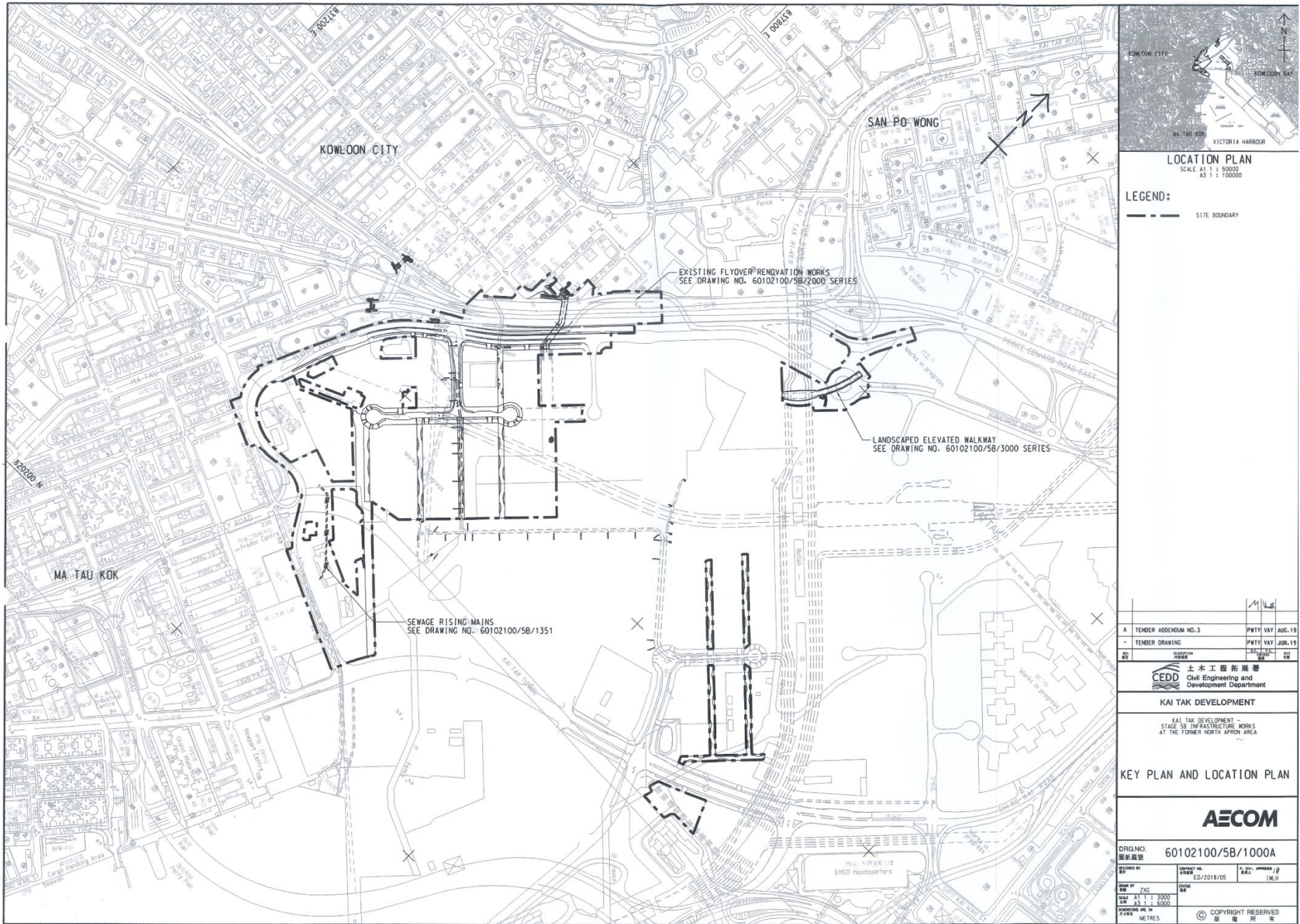


Figure 4 – Site Layout Plan



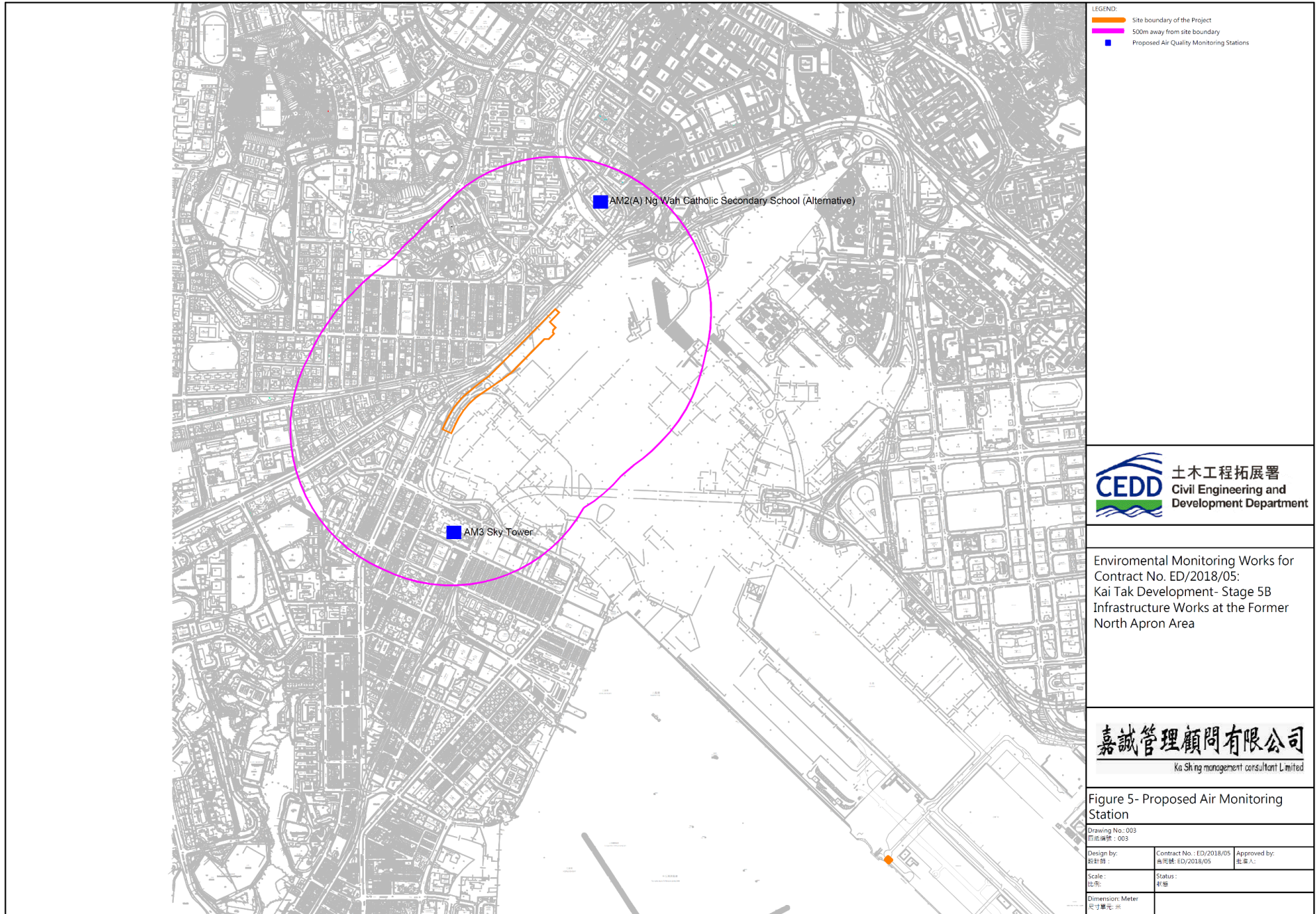


Figure 5 – Air Quality Monitoring Stations

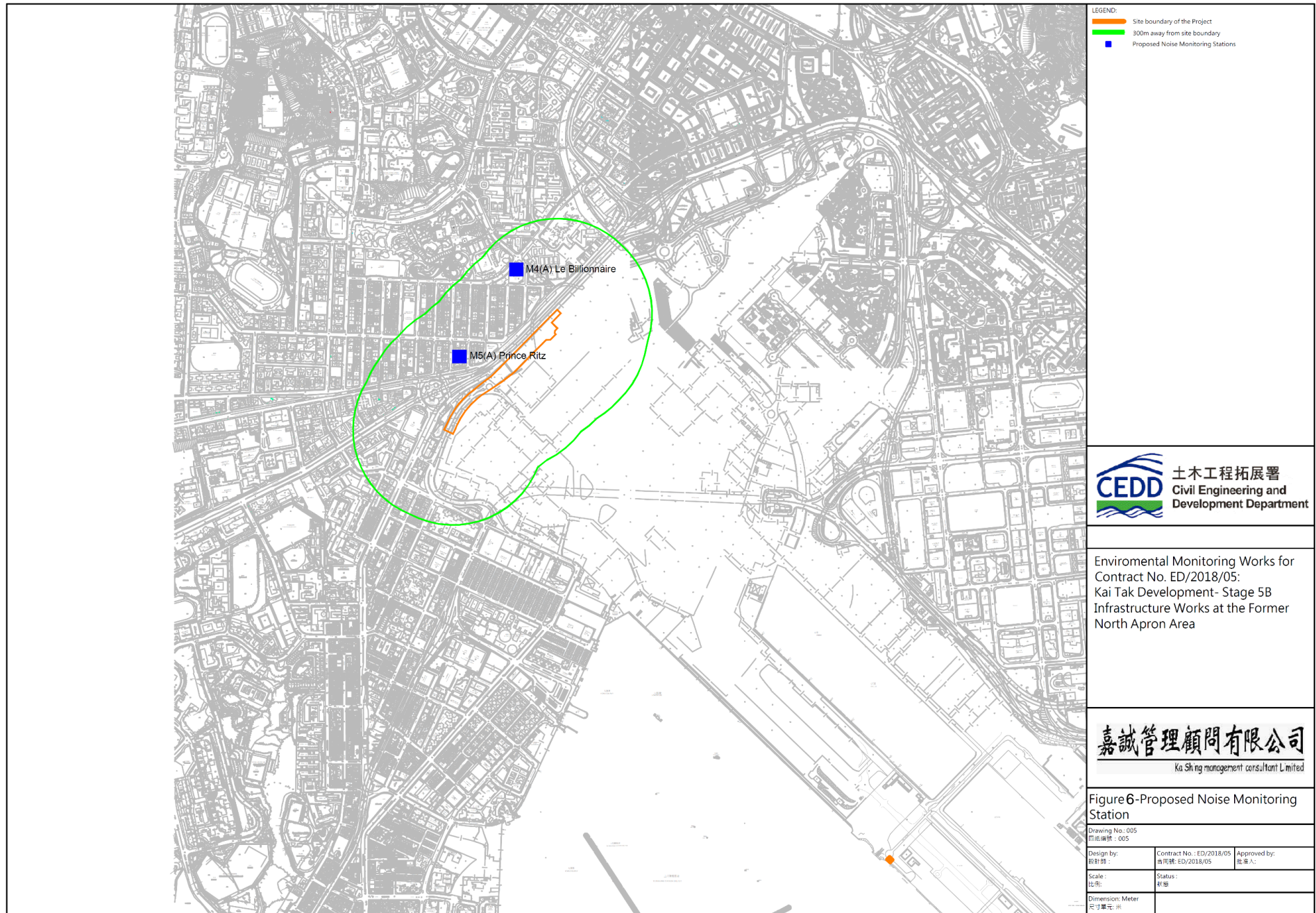


Figure 6 – Noise Monitoring Stations

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



# **Appendix B – Construction Programme**

















**Appendix C – Environmental monitoring schedules**

Environmental Monitoring and Weekly Site Inspection Schedule for December 2021

December 2021

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2 Weekly Site Inspection 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	3	4
5	6	7	8 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	9 Weekly Site Inspection	10	11
12	13	14 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	15	16	17 Weekly Site Inspection	18
19	20 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	21	22	23 Weekly Site Inspection	24 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3	25
26	27	28	29	30 Weekly Site Inspection + SSMC meeting 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	31	

**Air Quality Monitoring Station**

AM2(A) Ng Wah Catholic Secondary School  
AM3 - Sky Tower

**Noise Quality Monitoring Station**

M4(A) - Le Billionnaire  
M5(A) - Prince Ritz

Environmental Monitoring and Weekly Site Inspection Schedule for January 2022

January 2022

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	6 Weekly Site Inspection	7	8
9	10	11 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	12	13 Weekly Site Inspection	14	15
16	17 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	18	19	20 Weekly Site Inspection	21	22 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3
23	24	25	26 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	27 Weekly Site Inspection + SSMC meeting	28	29
30	31 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)					

NOTE:

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

**Air Quality Monitoring Station**

AM2(A) Ng Wah Catholic Secondary School  
AM3 - Sky Tower

**Noise Quality Monitoring Station**

M4(A) - Le Billionnaire  
M5(A) - Prince Ritz



**Appendix D – Photographic records**

## Impact Air Quality Monitoring



Measurement setup at AM2(A)



Measurement setup at AM3



Weather Station at the rooftop of Ng Wah Catholic Secondary School

Impact Noise Monitoring



Measurement setup at M4(A)



Measurement setup at M5(A)

**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  
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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-01-2021111801      Date of calibration : 18/11/2021

Location : Sky Tower      Sampler : TE-5170X

Serial Number : 4687

Ambient barometric pressure, Pa = 760.6 (mmHg)      Ambient temperature, Ta = 300.45 (deg K)

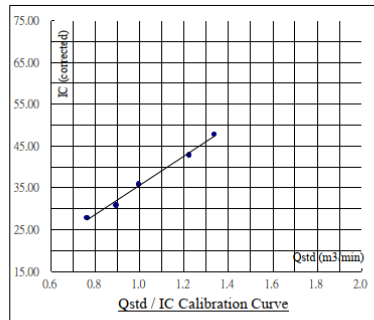
Qstd Slope, m = 2.03518      Qstd Intercept, b = -0.005890

**Calibration Curve**

Plate No.	H <sub>2</sub> O (in)	Qstd (m <sup>3</sup> / min)	I (chart)	IC (corrected)
18	7.40	1.335	48.0	47.82
13	6.20	1.222	43.0	42.84
10	4.10	0.994	36.0	35.87
7	3.30	0.892	31.0	30.89
5	2.40	0.761	28.0	27.90

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff. r
Dickson recorder	$Qstd = 1 / m1 [ (I) ( \text{Sqrt} ( (Pa / 760) (298 / Ta) ) ) - b1 ]$	34.907	0.7324	0.9962



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 :  18/11/2021      Checked by :  18/11/2021

Name : ( Ben Poon )      Name : ( Tommy Wong )

Fern.No. INS-HVS-CAL 04 16 01 2020

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

Calibration curve ref. No. : ATSPC-01-2021111804      Date of calibration : 18/11/2021

Location : Ng Wah Catholic Secondary School      Sampler : TE-5170X

Serial Numbers : 4360

Ambient barometric pressure, Pa = 760.6 (mmHg)      Ambient temperature, Ta = 300.45 (deg K)

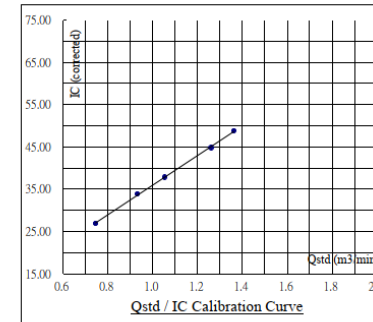
Qstd Slope, m = 2.03518      Qstd Intercept, b = -0.005890

**Calibration Curve**

Plate No.	H <sub>2</sub> O (in)	Qstd (m <sup>3</sup> / min)	I (chart)	IC (corrected)
18	7.70	1.361	49.0	48.82
13	6.60	1.261	45.0	44.83
10	4.60	1.053	38.0	37.86
7	3.60	0.932	34.0	33.87
5	2.30	0.745	27.0	26.90

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff. r
Dickson recorder	$Qstd = 1 / m1 [ (I) ( \text{Sqrt} ( (Pa / 760) (298 / Ta) ) ) - b1 ]$	35.073	0.9142	0.9996



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 :  18/11/2021      Checked by :  18/11/2021

Name : ( Ben Poon )      Name : ( Tommy Wong )

Fern.No. INS-HVS-CAL 04 16 01 2020



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

# Certificate of Calibration

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

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

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left( \frac{Ta}{Pa} \right)}$ (y-axis)
1.0094	0.7024	1.4239	0.9958	0.6929	0.8796
1.0051	0.9922	2.0136	0.9915	0.9788	1.2439
1.0029	1.1070	2.2513	0.9894	1.0921	1.3907
1.0017	1.1662	2.3612	0.9882	1.1504	1.4586
0.9964	1.4014	2.8477	0.9829	1.3824	1.7591
<b>QSTD</b>	m=	<b>2.03518</b>	<b>QA</b>	m=	<b>1.27440</b>
	b=	<b>-0.00589</b>		b=	<b>-0.00364</b>
	r=	<b>0.99997</b>		r=	<b>0.99997</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.  
100 South Miami Avenue  
Cleveland, Ohio 44115-4500

[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 AM510 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

<b>Sensitivity</b>	90° light scattering, 670 nm laser diode
Sensor Type	0.001 to 20 mg/m <sup>3</sup> (calibrated to respirable fraction of ISO 12103-1, A1 test dust)
Aerosol Concentration Range	0.1 to 10 micrometer (µm)
Particle Size Range	0.001 mg/m <sup>3</sup>
Minimum Resolution	±0.001 mg/m <sup>3</sup> over 24 hours
Zero stability	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)

<b>Flow Rate</b>	User-adjustable, 0.7 to 1.8 liters/min (L/min)
Range	

<b>Temperature Range</b>	32 to 120°F (0 to 50°C)
Operating Range	
Storage Range	-4 to 140°F (-20 to 60°C)

<b>Operational Humidity</b>	0 to 95% RH, non-condensing
-----------------------------	-----------------------------

<b>Time Constant (LCD display)</b>	User-adjustable, 1 to 60 seconds
Range	

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

<b>User-Select Calibration Factors</b>	1.0 (non-adjustable)
Factory Setting	
User-defined Settings	3, with user-defined labels
Range	0.1 to 10.0, user-adjustable

<b>Physical</b>	
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 Tripod Socket	2 line x 12 character LCD 1/4-20 female thread

<b>Power Supply/Charger (P/N 2613210)</b>	
Input Voltage Range	100 to 240 VAC, 50 to 60 Hz
Output Voltage	9 VDC @ 1.0 A

### Maintenance

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

### Communications Interface

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

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

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

### Battery Performance

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

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

### Battery Level Indicator

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



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

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

<b>Environment Conditions</b>		<b>Model</b>	<b>AM510</b>
Temperature	75.69 (24.3) °F (°C)	<b>Serial Number</b>	<b>11208032</b>
Relative Humidity	49.8 %RH		
Barometric Pressure	28.78 (974.6) inHg (hPa)		

As Left       In Tolerance  
 As Found       Out of Tolerance

**Concentration Linearity Plot**  

System ID: DTH101-02

CONCENTRATION			Unit: mg/m <sup>3</sup>				
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	1.625	1.584	1.462-1.788	3	0.064	0.063	0.045-0.083
2	0.234	0.235	0.199-0.269	4	13.990	13.985	12.591-15.389

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

<b>Measurement Variable</b>	<b>System ID</b>	<b>Last Cal.</b>	<b>Cal. Due</b>	<b>Measurement Variable</b>	<b>System ID</b>	<b>Last Cal.</b>	<b>Cal. Due</b>
DC Voltage	E003314	01-11-21	01-31-22	Pneumometer	E003319	02-15-21	08-31-21
Microbalance	M001324	01-29-21	01-31-23	Pressure	E003511	10-26-20	10-31-21
Flowmeter	E005626	03-09-21	03-31-22	DC Voltage	E003315	01-11-21	01-31-22

August 11, 2021  
 Date

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

Performance Check ref. No. AS0210818-4 Report Issue Date 18/08/2021  
 Date of performance check 16/08/2021

**Objective:**

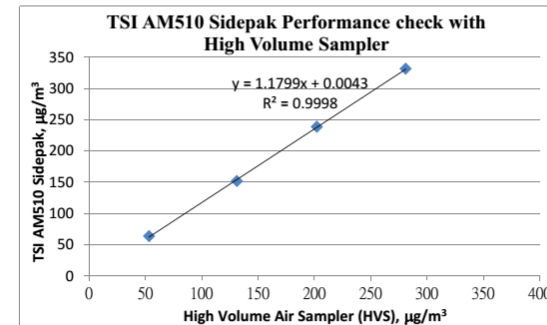
A dust meter and a Total Suspended Particulate High Volume Air Sampler (HVS) were placed together to measure the Total Suspended Particulate (TSP) concentrations simultaneously to check the performance.

**Equipment Used:**

Equipment	Manufacturer and Model	Serial Number
Personal Aerosol Monitor	TSI AM510 Sidepak	11208032
Total Suspended Particulate High Volume Air Sampler	GS2310	10346


**Result:**

Equipment	Measurement Result, µg/m <sup>3</sup>			
TSI AM510 Sidepak	64	152	239	332
High Volume Air Sampler (HVS)	53	131	202	281



Tested by : 18/08/2021      Checked by : 18/08/2021  
 Name : ( Ben Poon )      Name : ( Tommy Wong )


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



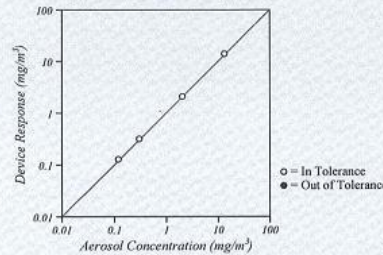
**CERTIFICATE OF CALIBRATION AND TESTING**  
 TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
 Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

Environment Conditions		Model	AM510
Temperature	76.78 (24.9) °F (°C)	Serial Number	11506014
Relative Humidity	44.9 %RH		
Barometric Pressure	28.92 (979.3) inHg (hPa)		

As Left       In Tolerance  
 As Found       Out of Tolerance



**Concentration Linearity Plot**




System ID: DTH01-02

CONCENTRATION				Unit: mg/m <sup>3</sup>			
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	2.032	1.967	1.829-2.235	3	0.117	0.120	0.082-0.152
2	0.297	0.298	0.252-0.342	4	13.076	13.145	11.768-14.384

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

Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
DC Voltage	E003314	01-11-21	01-31-22	Photometer	E003319	02-15-21	08-31-21
Microbalance	M001324	01-29-21	01-31-23	Pressure	E003511	10-26-20	10-31-21
Flowmeter	E005626	03-09-21	03-31-22	DC Voltage	E003315	01-11-21	01-31-22

  
 Calibrated

June 10, 2021  
 Date

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

Performance Check ref. No. AS0210625-1      Report Issue Date 25/06/2021  
 Date of performance check 22/06/2021

**Objective:**

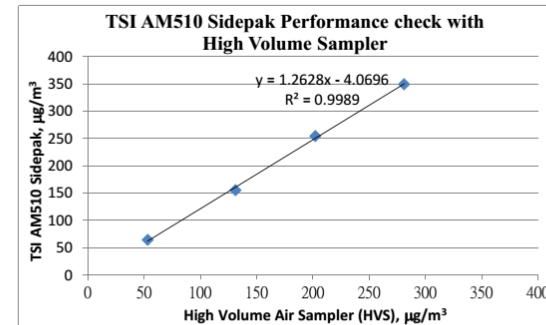
A dust meter and a Total Suspended Particulate High Volume Air Sampler (HVS) were placed together to measure the Total Suspended Particulate (TSP) concentrations simultaneously to check the performance.



**Equipment Used:**

Equipment	Manufacturer and Model	Serial Number
Personal Aerosol Monitor	TSI AM510 Sidepak	11506014
Total Suspended Particulate High Volume Air Sampler	GS2310	10346

**Result:**

Equipment	Measurement Result, µg/m <sup>3</sup>			
TSI AM510 Sidepak	65	156	255	350
High Volume Air Sampler (HVS)	53	131	202	281



Tested by:  25/06/2021      Checked by:  25/06/2021  
 Name: ( Ben Poon )      Name: ( Tommy Wong )

Form No. ENV CAL SAMPLER CC1 d412/12/2003



# Catalogue of Weather Station

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



**6152C  
6162C**  
**Vantage Pro2™**

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

### Integrated Sensor Suite (ISS)

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

Note: Maximum displayable wind decreases as the length of cable increases. At 140' (42 m) of cable, the maximum wind speed displayed is 135 mph (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

Wind Chill (Calculated)	
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

### Wind Direction

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

### Wind Speed

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



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

AAS-T-W5-03, 30/9/2021

**Calibration Certificate No.: CC0262109**

**Customer Information**

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

**Equipment Identification**

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

**Certificate Information**

Date of Receipt:	29 September 2021	Calibration Condition:	24.5°C, 54%RH, 1001hPa
Date of Calibration:	30 September 2021	Adjustment:	The arrow head was adjusted to the magnetic north before performing calibration.
Due Date of Calibration:	N/A	Appearance:	Good
Calibration Procedure:	JIF 1183-2007, JIG 1076-2001, SOP-116, SOP-252	Remark:	N/A

**Reference Equipment Identification**

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

Note1: The estimated expanded uncertainties have been calculated in "Evaluation and expression of uncertainty in measurement" and give an internal estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.  
 Note2: The standard (s) and instrument used in the calibration are traceable to national or international recognized standard and are calibrated on a schedule to maintain the accuracy and good condition.  
 Note3: The result reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long term stability of the instrument.  
 Note4: The result shows in this calibration certificate relate only to the item calibrated, and the result only applies to the calibration item as received.

Approved By:

*Warren Yeung*  
 Warren Yeung

Company Chop:



Certificate issue Date: 4 October 2021

CT-88G-03

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

CC0262109  
 Page 1 of 2



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

**Result of Calibration**

**Temperature**

Reference reading (°C)	Reading (°C)	Error (°C)
15.0	15	0.0
20.0	20	0.0
25.0	25	0.0
30.0	30	0.0

**Relative Humidity**

Reference reading (%RH)	Reading (%RH)	Error (%RH)
40.0	41	1
50.0	52	2
70.0	72	2

**Wind Speed**

Reference reading (m/s)	Measured reading (m/s)	Error (%)
0.0	0.0	N/A
2.0	2.1	5.0
5.0	5.2	4.0
8.0	8.2	2.5

**Wind Direction**

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

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

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CC0262109  
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**Appendix F – Weather information**

## General Information

Date	Absolute Daily Min Temperature (°C)	Absolute Daily Max Temperature (°C)	Total Rainfall (mm)	Mean Relative Humidity (%)
01/12/2021	14.8	20.1	0.0	40
02/12/2021	14.6	20.4	0.0	42
03/12/2021	14.7	21.3	0.0	35
04/12/2021	15.3	20.6	0.0	46
05/12/2021	16.7	22.2	0.0	55
06/12/2021	16.4	22.2	0.0	59
07/12/2021	17.1	22.5	0.0	65
08/12/2021	18.4	22.2	0.0	67
09/12/2021	18.7	22.9	0.0	72
10/12/2021	18.6	23.7	0.0	73
11/12/2021	20.0	24.4	0.0	74
12/12/2021	19.2	24.7	0.0	75
13/12/2021	17.4	21.5	0.0	67
14/12/2021	18.7	23.6	Trace	72
15/12/2021	19.9	23.0	0.2	78
16/12/2021	21.7	25.8	Trace	81
17/12/2021	18.9	23.8	0.0	69
18/12/2021	16.3	20.0	0.0	58
19/12/2021	16.0	19.7	0.0	51
20/12/2021	15.7	19.3	9.4	78
21/12/2021	16.0	19.0	2.4	88
22/12/2021	17.1	21.7	Trace	80
23/12/2021	18.7	21.9	0.8	77
24/12/2021	18.2	21.8	1.7	84
25/12/2021	17.9	21.5	Trace	75
26/12/2021	11.7	18.5	3.5	78
27/12/2021	9.9	14.6	1.3	81
28/12/2021	12.2	17.5	0.2	74
29/12/2021	16.6	20.6	0.0	74
30/12/2021	16.2	21.4	0.0	77
31/12/2021	17.1	19.9	Trace	78

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=12>

## Kai Tak Runway Park Information

Date	Absolute Daily Min Temperature (°C)	Absolute Daily Max Temperature (°C)
01/12/2021	14.6	21.3
02/12/2021	14.0	22.3
03/12/2021	14.4	23.0
04/12/2021	14.8	20.4
05/12/2021	16.5	22.4
06/12/2021	15.6	23.3
07/12/2021	16.5	22.5
08/12/2021	18.7	21.8
09/12/2021	18.8	22.4
10/12/2021	18.4	23.5
11/12/2021	20.0	23.9
12/12/2021	19.3	25.9
13/12/2021	17.0	22.2
14/12/2021	18.6	25.3
15/12/2021	18.8	22.9
16/12/2021	21.3	25.2
17/12/2021	18.5	23.7
18/12/2021	16.0	21.3
19/12/2021	19.6	19.6
20/12/2021	14.8	19.6
21/12/2021	16.4	19.9
22/12/2021	16.7	23.4
23/12/2021	18.9	21.7
24/12/2021	18.4	24.0
25/12/2021	16.8	21.2
26/12/2021	12.2	18.0
27/12/2021	10.0	15.6
28/12/2021	12.2	18.3
29/12/2021	16.8	23.2
30/12/2021	16.0	22.2
31/12/2021	17.0	19.2

NOTE1: The above weather information was obtained from manned weather station of Kai Tak Runway Park.

[https://i-lens.hk/hkweather/history\\_chart.php?date=2021-12-01&chart\\_type=DG\\_TEMP](https://i-lens.hk/hkweather/history_chart.php?date=2021-12-01&chart_type=DG_TEMP)

Mean Wind Speed and Wind Direction recorded by the weather station setup at the rooftop of Ng Wah Catholic Secondary School

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



Mean Wind Speed and Wind Direction recorded by the weather station setup at the rooftop of Ng Wah Catholic Secondary School

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

Mean Wind Speed and Wind Direction recorded by the weather station setup at the rooftop of Ng Wah Catholic Secondary School

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
09/12/2021	0:00	0.9	112.5	10/12/2021	0:00	1.8	90	11/12/2021	0:00	0.9	292.5	12/12/2021	0:00	1.3	247.5
09/12/2021	1:00	1.8	247.5	10/12/2021	1:00	0.9	112.5	11/12/2021	1:00	0.9	292.5	12/12/2021	1:00	1.3	292.5
09/12/2021	2:00	1.8	90	10/12/2021	2:00	1.8	67.5	11/12/2021	2:00	1.3	292.5	12/12/2021	2:00	0.9	157.5
09/12/2021	3:00	0.9	112.5	10/12/2021	3:00	1.3	112.5	11/12/2021	3:00	0.9	225	12/12/2021	3:00	0.9	247.5
09/12/2021	4:00	1.8	67.5	10/12/2021	4:00	0.4	112.5	11/12/2021	4:00	0.9	247.5	12/12/2021	4:00	1.3	225
09/12/2021	5:00	1.3	112.5	10/12/2021	5:00	1.3	90	11/12/2021	5:00	0.9	270	12/12/2021	5:00	1.3	45
09/12/2021	6:00	0.4	112.5	10/12/2021	6:00	1.8	90	11/12/2021	6:00	0.9	112.5	12/12/2021	6:00	1.8	337.5
09/12/2021	7:00	1.3	90	10/12/2021	7:00	1.3	112.5	11/12/2021	7:00	0.9	22.5	12/12/2021	7:00	1.3	247.5
09/12/2021	8:00	1.8	90	10/12/2021	8:00	1.8	225	11/12/2021	8:00	0.9	202.5	12/12/2021	8:00	1.3	247.5
09/12/2021	9:00	1.3	112.5	10/12/2021	9:00	1.3	135	11/12/2021	9:00	0.9	45	12/12/2021	9:00	1.3	247.5
09/12/2021	10:00	1.8	225	10/12/2021	10:00	1.8	90	11/12/2021	10:00	0.4	67.5	12/12/2021	10:00	1.3	225
09/12/2021	11:00	1.3	135	10/12/2021	11:00	1.3	270	11/12/2021	11:00	0.9	45	12/12/2021	11:00	1.3	270
09/12/2021	12:00	1.3	112.5	10/12/2021	12:00	1.3	90	11/12/2021	12:00	0.4	337.5	12/12/2021	12:00	1.3	247.5
09/12/2021	13:00	1.3	135	10/12/2021	13:00	1.3	45	11/12/2021	13:00	0.9	315	12/12/2021	13:00	1.3	292.5
09/12/2021	14:00	1.8	67.5	10/12/2021	14:00	1.3	45	11/12/2021	14:00	0.4	112.5	12/12/2021	14:00	1.3	112.5
09/12/2021	15:00	0.9	45	10/12/2021	15:00	1.8	45	11/12/2021	15:00	0.4	90	12/12/2021	15:00	1.3	112.5
09/12/2021	16:00	0.9	45	10/12/2021	16:00	1.8	45	11/12/2021	16:00	0.4	135	12/12/2021	16:00	0.9	157.5
09/12/2021	17:00	1.8	90	10/12/2021	17:00	1.3	270	11/12/2021	17:00	0.4	67.5	12/12/2021	17:00	0.9	135
09/12/2021	18:00	1.8	67.5	10/12/2021	18:00	1.3	90	11/12/2021	18:00	0.9	112.5	12/12/2021	18:00	0.9	90
09/12/2021	19:00	1.3	67.5	10/12/2021	19:00	1.3	45	11/12/2021	19:00	0.9	112.5	12/12/2021	19:00	1.3	112.5
09/12/2021	20:00	1.3	90	10/12/2021	20:00	1.3	45	11/12/2021	20:00	1.3	135	12/12/2021	20:00	1.3	112.5
09/12/2021	21:00	0.9	67.5	10/12/2021	21:00	1.8	45	11/12/2021	21:00	1.3	90	12/12/2021	21:00	0.9	112.5
09/12/2021	22:00	0.9	67.5	10/12/2021	22:00	1.8	45	11/12/2021	22:00	1.3	112.5	12/12/2021	22:00	0.9	90
09/12/2021	23:00	0.9	90	10/12/2021	23:00	1.3	270	11/12/2021	23:00	1.3	112.5	12/12/2021	23:00	1.3	112.5

Mean Wind Speed and Wind Direction recorded by the weather station setup at the rooftop of Ng Wah Catholic Secondary School

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
13/12/2021	0:00	1.8	90	14/12/2021	0:00	0.9	90	15/12/2021	0:00	0.9	90	16/12/2021	0:00	0.9	45
13/12/2021	1:00	1.3	337.5	14/12/2021	1:00	0.9	112.5	15/12/2021	1:00	0.9	90	16/12/2021	1:00	0.4	225
13/12/2021	2:00	1.8	135	14/12/2021	2:00	0.9	112.5	15/12/2021	2:00	0.9	90	16/12/2021	2:00	0.4	292.5
13/12/2021	3:00	1.8	67.5	14/12/2021	3:00	0.9	112.5	15/12/2021	3:00	0.4	112.5	16/12/2021	3:00	0.4	180
13/12/2021	4:00	1.3	135	14/12/2021	4:00	0.9	112.5	15/12/2021	4:00	0.4	112.5	16/12/2021	4:00	0.4	157.5
13/12/2021	5:00	0.9	292.5	14/12/2021	5:00	1.3	112.5	15/12/2021	5:00	0.9	112.5	16/12/2021	5:00	0.4	135
13/12/2021	6:00	0.9	247.5	14/12/2021	6:00	0.9	135	15/12/2021	6:00	0.9	112.5	16/12/2021	6:00	0.4	135
13/12/2021	7:00	0.9	45	14/12/2021	7:00	0.4	112.5	15/12/2021	7:00	0.4	90	16/12/2021	7:00	1.3	135
13/12/2021	8:00	0.9	247.5	14/12/2021	8:00	0.9	135	15/12/2021	8:00	0.9	90	16/12/2021	8:00	0.4	135
13/12/2021	9:00	1.3	337.5	14/12/2021	9:00	0.9	135	15/12/2021	9:00	1.8	112.5	16/12/2021	9:00	0.9	247.5
13/12/2021	10:00	0.9	45	14/12/2021	10:00	0.4	135	15/12/2021	10:00	1.8	112.5	16/12/2021	10:00	0.9	202.5
13/12/2021	11:00	1.8	90	14/12/2021	11:00	0.9	135	15/12/2021	11:00	2.2	112.5	16/12/2021	11:00	0.9	45
13/12/2021	12:00	1.3	337.5	14/12/2021	12:00	0.9	247.5	15/12/2021	12:00	1.8	90	16/12/2021	12:00	0.4	90
13/12/2021	13:00	1.8	135	14/12/2021	13:00	1.3	247.5	15/12/2021	13:00	0.9	67.5	16/12/2021	13:00	0.4	112.5
13/12/2021	14:00	1.8	67.5	14/12/2021	14:00	0.9	247.5	15/12/2021	14:00	0.9	157.5	16/12/2021	14:00	0.9	112.5
13/12/2021	15:00	0.9	112.5	14/12/2021	15:00	0.9	112.5	15/12/2021	15:00	0.9	22.5	16/12/2021	15:00	0.9	112.5
13/12/2021	16:00	1.8	90	14/12/2021	16:00	0.9	90	15/12/2021	16:00	1.3	135	16/12/2021	16:00	0.9	112.5
13/12/2021	17:00	1.3	112.5	14/12/2021	17:00	0.9	90	15/12/2021	17:00	1.3	90	16/12/2021	17:00	0.9	157.5
13/12/2021	18:00	0.4	135	14/12/2021	18:00	1.8	112.5	15/12/2021	18:00	1.8	247.5	16/12/2021	18:00	0.9	157.5
13/12/2021	19:00	1.3	135	14/12/2021	19:00	1.8	112.5	15/12/2021	19:00	1.3	22.5	16/12/2021	19:00	0.9	180
13/12/2021	20:00	1.3	112.5	14/12/2021	20:00	1.3	112.5	15/12/2021	20:00	0.9	90	16/12/2021	20:00	0.4	180
13/12/2021	21:00	1.8	90	14/12/2021	21:00	1.3	90	15/12/2021	21:00	1.3	22.5	16/12/2021	21:00	0.9	247.5
13/12/2021	22:00	0.9	112.5	14/12/2021	22:00	0.4	112.5	15/12/2021	22:00	0.9	315	16/12/2021	22:00	0.4	247.5
13/12/2021	23:00	0.9	67.5	14/12/2021	23:00	0.9	112.5	15/12/2021	23:00	0.9	90	16/12/2021	23:00	0.4	67.5

Mean Wind Speed and Wind Direction recorded by the weather station setup at the rooftop of Ng Wah Catholic Secondary School

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
17/12/2021	0:00	0.9	112.5	18/12/2021	0:00	0.4	112.5	19/12/2021	0:00	1.3	247.5	20/12/2021	0:00	0.9	112.5
17/12/2021	1:00	0.4	112.5	18/12/2021	1:00	0.4	112.5	19/12/2021	1:00	0.9	247.5	20/12/2021	1:00	0.9	157.5
17/12/2021	2:00	0.9	112.5	18/12/2021	2:00	0.4	112.5	19/12/2021	2:00	1.3	247.5	20/12/2021	2:00	0.9	135
17/12/2021	3:00	0.9	90	18/12/2021	3:00	0.4	90	19/12/2021	3:00	1.3	157.5	20/12/2021	3:00	1.3	135
17/12/2021	4:00	0.9	112.5	18/12/2021	4:00	1.3	22.5	19/12/2021	4:00	1.3	180	20/12/2021	4:00	0.9	112.5
17/12/2021	5:00	0.9	112.5	18/12/2021	5:00	1.3	22.5	19/12/2021	5:00	0.9	225	20/12/2021	5:00	0.9	112.5
17/12/2021	6:00	1.3	112.5	18/12/2021	6:00	1.8	270	19/12/2021	6:00	0.9	225	20/12/2021	6:00	0.9	112.5
17/12/2021	7:00	1.3	135	18/12/2021	7:00	1.8	135	19/12/2021	7:00	1.3	225	20/12/2021	7:00	0.9	112.5
17/12/2021	8:00	0.9	112.5	18/12/2021	8:00	1.8	22.5	19/12/2021	8:00	0.9	202.5	20/12/2021	8:00	0.4	112.5
17/12/2021	9:00	1.3	90	18/12/2021	9:00	0.9	292.5	19/12/2021	9:00	0.4	180	20/12/2021	9:00	0.4	112.5
17/12/2021	10:00	0.9	112.5	18/12/2021	10:00	0.9	90	19/12/2021	10:00	0.4	247.5	20/12/2021	10:00	0.9	112.5
17/12/2021	11:00	1.3	112.5	18/12/2021	11:00	1.8	22.5	19/12/2021	11:00	0.4	247.5	20/12/2021	11:00	0.9	112.5
17/12/2021	12:00	0.9	112.5	18/12/2021	12:00	0.4	112.5	19/12/2021	12:00	0.9	112.5	20/12/2021	12:00	0.9	22.5
17/12/2021	13:00	0.9	112.5	18/12/2021	13:00	1.3	112.5	19/12/2021	13:00	0.9	90	20/12/2021	13:00	0.4	67.5
17/12/2021	14:00	1.3	112.5	18/12/2021	14:00	1.8	112.5	19/12/2021	14:00	0.9	247.5	20/12/2021	14:00	1.3	337.5
17/12/2021	15:00	1.3	135	18/12/2021	15:00	2.2	135	19/12/2021	15:00	1.3	247.5	20/12/2021	15:00	1.8	22.5
17/12/2021	16:00	0.9	112.5	18/12/2021	16:00	1.3	157.5	19/12/2021	16:00	1.3	157.5	20/12/2021	16:00	0.9	112.5
17/12/2021	17:00	0.9	112.5	18/12/2021	17:00	1.8	112.5	19/12/2021	17:00	1.8	135	20/12/2021	17:00	1.3	135
17/12/2021	18:00	0.9	112.5	18/12/2021	18:00	1.3	135	19/12/2021	18:00	1.3	135	20/12/2021	18:00	0.9	112.5
17/12/2021	19:00	0.4	112.5	18/12/2021	19:00	1.8	112.5	19/12/2021	19:00	1.3	135	20/12/2021	19:00	1.3	112.5
17/12/2021	20:00	0.4	112.5	18/12/2021	20:00	1.3	90	19/12/2021	20:00	0.9	112.5	20/12/2021	20:00	1.3	112.5
17/12/2021	21:00	0.4	112.5	18/12/2021	21:00	1.3	90	19/12/2021	21:00	0.9	90	20/12/2021	21:00	1.8	112.5
17/12/2021	22:00	0.9	112.5	18/12/2021	22:00	1.3	112.5	19/12/2021	22:00	0.9	247.5	20/12/2021	22:00	1.3	90
17/12/2021	23:00	0.9	112.5	18/12/2021	23:00	0.4	112.5	19/12/2021	23:00	1.3	247.5	20/12/2021	23:00	0.9	112.5

Mean Wind Speed and Wind Direction recorded by the weather station setup at the rooftop of Ng Wah Catholic Secondary School

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
21/12/2021	0:00	0.4	90	22/12/2021	0:00	1.3	112.5	23/12/2021	0:00	0.9	112.5	24/12/2021	0:00	0.4	112.5
21/12/2021	1:00	0.4	112.5	22/12/2021	1:00	1.3	135	23/12/2021	1:00	0.9	112.5	24/12/2021	1:00	0.4	112.5
21/12/2021	2:00	0.4	112.5	22/12/2021	2:00	0.9	157.5	23/12/2021	2:00	0.9	270	24/12/2021	2:00	0.4	135
21/12/2021	3:00	0.9	112.5	22/12/2021	3:00	0.9	135	23/12/2021	3:00	1.3	270	24/12/2021	3:00	0.9	112.5
21/12/2021	4:00	0.9	112.5	22/12/2021	4:00	0.9	135	23/12/2021	4:00	0.9	135	24/12/2021	4:00	0.9	67.5
21/12/2021	5:00	0.9	90	22/12/2021	5:00	0.9	90	23/12/2021	5:00	0.9	112.5	24/12/2021	5:00	0.9	112.5
21/12/2021	6:00	1.3	112.5	22/12/2021	6:00	1.3	90	23/12/2021	6:00	1.3	112.5	24/12/2021	6:00	0.9	112.5
21/12/2021	7:00	0.9	135	22/12/2021	7:00	0.9	135	23/12/2021	7:00	1.8	90	24/12/2021	7:00	0.9	90
21/12/2021	8:00	0.9	135	22/12/2021	8:00	1.8	247.5	23/12/2021	8:00	1.8	112.5	24/12/2021	8:00	0.9	90
21/12/2021	9:00	1.3	157.5	22/12/2021	9:00	1.3	247.5	23/12/2021	9:00	1.3	112.5	24/12/2021	9:00	1.3	67.5
21/12/2021	10:00	0.4	90	22/12/2021	10:00	1.3	112.5	23/12/2021	10:00	1.3	135	24/12/2021	10:00	1.3	112.5
21/12/2021	11:00	0.4	112.5	22/12/2021	11:00	0.4	135	23/12/2021	11:00	0.9	112.5	24/12/2021	11:00	1.3	90
21/12/2021	12:00	0.9	270	22/12/2021	12:00	0.4	225	23/12/2021	12:00	0.4	315	24/12/2021	12:00	0.4	112.5
21/12/2021	13:00	0.9	225	22/12/2021	13:00	0.9	225	23/12/2021	13:00	0.4	270	24/12/2021	13:00	0.4	112.5
21/12/2021	14:00	0.9	45	22/12/2021	14:00	0.4	225	23/12/2021	14:00	0.9	112.5	24/12/2021	14:00	0.4	135
21/12/2021	15:00	0.4	112.5	22/12/2021	15:00	0.9	247.5	23/12/2021	15:00	0.9	292.5	24/12/2021	15:00	0.4	135
21/12/2021	16:00	0.4	90	22/12/2021	16:00	0.9	247.5	23/12/2021	16:00	1.8	22.5	24/12/2021	16:00	0.4	112.5
21/12/2021	17:00	0.9	112.5	22/12/2021	17:00	0.9	67.5	23/12/2021	17:00	1.3	90	24/12/2021	17:00	0.4	135
21/12/2021	18:00	0.9	90	22/12/2021	18:00	1.3	180	23/12/2021	18:00	0.4	315	24/12/2021	18:00	0.9	135
21/12/2021	19:00	0.9	112.5	22/12/2021	19:00	0.9	135	23/12/2021	19:00	0.4	270	24/12/2021	19:00	0.4	112.5
21/12/2021	20:00	0.9	90	22/12/2021	20:00	0.9	112.5	23/12/2021	20:00	0.4	292.5	24/12/2021	20:00	0.4	135
21/12/2021	21:00	0.9	112.5	22/12/2021	21:00	0.4	135	23/12/2021	21:00	0.4	247.5	24/12/2021	21:00	0.9	112.5
21/12/2021	22:00	0.9	270	22/12/2021	22:00	0.4	225	23/12/2021	22:00	0.4	225	24/12/2021	22:00	0.9	112.5
21/12/2021	23:00	0.9	225	22/12/2021	23:00	0.9	225	23/12/2021	23:00	0.4	90	24/12/2021	23:00	0.4	135

Mean Wind Speed and Wind Direction recorded by the weather station setup at the rooftop of Ng Wah Catholic Secondary School

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
25/12/2021	0:00	0.9	112.5	26/12/2021	0:00	1.3	67.5	27/12/2021	0:00	0.4	112.5	28/12/2021	0:00	0.9	247.5
25/12/2021	1:00	1.3	112.5	26/12/2021	1:00	1.8	45	27/12/2021	1:00	0.4	112.5	28/12/2021	1:00	0.9	225
25/12/2021	2:00	1.3	112.5	26/12/2021	2:00	1.3	112.5	27/12/2021	2:00	0.4	112.5	28/12/2021	2:00	0.9	247.5
25/12/2021	3:00	1.3	112.5	26/12/2021	3:00	1.3	112.5	27/12/2021	3:00	0.9	135	28/12/2021	3:00	0.9	225
25/12/2021	4:00	1.3	112.5	26/12/2021	4:00	1.3	135	27/12/2021	4:00	0.9	135	28/12/2021	4:00	0.9	247.5
25/12/2021	5:00	1.3	112.5	26/12/2021	5:00	1.3	112.5	27/12/2021	5:00	1.3	112.5	28/12/2021	5:00	0.9	270
25/12/2021	6:00	1.3	112.5	26/12/2021	6:00	2.2	112.5	27/12/2021	6:00	0.9	112.5	28/12/2021	6:00	0.9	270
25/12/2021	7:00	0.9	112.5	26/12/2021	7:00	1.8	45	27/12/2021	7:00	0.9	112.5	28/12/2021	7:00	0.9	270
25/12/2021	8:00	0.9	112.5	26/12/2021	8:00	2.2	90	27/12/2021	8:00	1.8	112.5	28/12/2021	8:00	0.9	247.5
25/12/2021	9:00	1.3	90	26/12/2021	9:00	2.2	90	27/12/2021	9:00	1.8	112.5	28/12/2021	9:00	0.9	225
25/12/2021	10:00	0.4	112.5	26/12/2021	10:00	1.3	67.5	27/12/2021	10:00	0.4	112.5	28/12/2021	10:00	0.9	247.5
25/12/2021	11:00	1.3	112.5	26/12/2021	11:00	1.8	45	27/12/2021	11:00	0.4	112.5	28/12/2021	11:00	0.4	225
25/12/2021	12:00	0.9	112.5	26/12/2021	12:00	1.3	112.5	27/12/2021	12:00	0.4	315	28/12/2021	12:00	0.9	225
25/12/2021	13:00	1.3	90	26/12/2021	13:00	0.9	112.5	27/12/2021	13:00	0.4	22.5	28/12/2021	13:00	0.9	225
25/12/2021	14:00	1.3	90	26/12/2021	14:00	0.4	112.5	27/12/2021	14:00	0.4	90	28/12/2021	14:00	0.4	225
25/12/2021	15:00	1.3	90	26/12/2021	15:00	0.4	112.5	27/12/2021	15:00	0.9	67.5	28/12/2021	15:00	0.4	247.5
25/12/2021	16:00	1.3	112.5	26/12/2021	16:00	0.9	112.5	27/12/2021	16:00	1.3	247.5	28/12/2021	16:00	1.8	270
25/12/2021	17:00	1.3	135	26/12/2021	17:00	1.3	112.5	27/12/2021	17:00	1.8	90	28/12/2021	17:00	0.4	247.5
25/12/2021	18:00	1.8	112.5	26/12/2021	18:00	1.3	112.5	27/12/2021	18:00	1.8	112.5	28/12/2021	18:00	0.4	247.5
25/12/2021	19:00	1.3	112.5	26/12/2021	19:00	0.9	90	27/12/2021	19:00	1.3	90	28/12/2021	19:00	0.9	247.5
25/12/2021	20:00	0.9	112.5	26/12/2021	20:00	0.9	112.5	27/12/2021	20:00	1.3	112.5	28/12/2021	20:00	0.4	225
25/12/2021	21:00	0.9	135	26/12/2021	21:00	1.8	135	27/12/2021	21:00	1.3	112.5	28/12/2021	21:00	0.9	112.5
25/12/2021	22:00	1.8	112.5	26/12/2021	22:00	1.3	90	27/12/2021	22:00	1.3	247.5	28/12/2021	22:00	0.4	135
25/12/2021	23:00	1.3	90	26/12/2021	23:00	1.8	90	27/12/2021	23:00	1.3	247.5	28/12/2021	23:00	0.9	45

Mean Wind Speed and Wind Direction recorded by the weather station setup at the rooftop of Ng Wah Catholic Secondary School

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
29/12/2021	0:00	1.3	45	30/12/2021	0:00	0.9	112.5	31/12/2021	0:00	0.9	90				
29/12/2021	1:00	1.3	45	30/12/2021	1:00	0.4	90	31/12/2021	1:00	0.4	67.5				
29/12/2021	2:00	1.3	45	30/12/2021	2:00	0.9	90	31/12/2021	2:00	0.4	45				
29/12/2021	3:00	1.3	45	30/12/2021	3:00	1.3	90	31/12/2021	3:00	0.4	112.5				
29/12/2021	4:00	0.9	45	30/12/2021	4:00	1.8	90	31/12/2021	4:00	0.4	180				
29/12/2021	5:00	0.9	22.5	30/12/2021	5:00	1.3	135	31/12/2021	5:00	0.4	270				
29/12/2021	6:00	0.9	247.5	30/12/2021	6:00	0.9	67.5	31/12/2021	6:00	0.4	45				
29/12/2021	7:00	1.3	22.5	30/12/2021	7:00	0.9	45	31/12/2021	7:00	0.9	45				
29/12/2021	8:00	0.9	22.5	30/12/2021	8:00	0.4	67.5	31/12/2021	8:00	0.9	90				
29/12/2021	9:00	0.9	225	30/12/2021	9:00	0.9	112.5	31/12/2021	9:00	0.4	45				
29/12/2021	10:00	1.3	45	30/12/2021	10:00	0.4	135	31/12/2021	10:00	0.4	135				
29/12/2021	11:00	1.3	45	30/12/2021	11:00	0.4	90	31/12/2021	11:00	0.9	247.5				
29/12/2021	12:00	0.4	225	30/12/2021	12:00	0.4	112.5	31/12/2021	12:00	1.3	90				
29/12/2021	13:00	0.4	270	30/12/2021	13:00	0.4	90	31/12/2021	13:00	1.3	112.5				
29/12/2021	14:00	0.4	247.5	30/12/2021	14:00	0.4	67.5	31/12/2021	14:00	1.3	112.5				
29/12/2021	15:00	0.4	247.5	30/12/2021	15:00	0.4	90	31/12/2021	15:00	1.3	112.5				
29/12/2021	16:00	0.9	180	30/12/2021	16:00	0.4	90	31/12/2021	16:00	1.3	112.5				
29/12/2021	17:00	0.9	157.5	30/12/2021	17:00	0.4	135	31/12/2021	17:00	2.2	112.5				
29/12/2021	18:00	0.4	112.5	30/12/2021	18:00	0.9	135	31/12/2021	18:00	1.8	112.5				
29/12/2021	19:00	0.4	135	30/12/2021	19:00	0.9	135	31/12/2021	19:00	1.8	112.5				
29/12/2021	20:00	1.3	135	30/12/2021	20:00	1.3	112.5	31/12/2021	20:00	1.8	112.5				
29/12/2021	21:00	1.3	67.5	30/12/2021	21:00	1.3	112.5	31/12/2021	21:00	0.9	67.5				
29/12/2021	22:00	1.3	45	30/12/2021	22:00	0.4	112.5	31/12/2021	22:00	1.3	90				
29/12/2021	23:00	0.9	247.5	30/12/2021	23:00	0.4	112.5	31/12/2021	23:00	1.3	112.5				

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



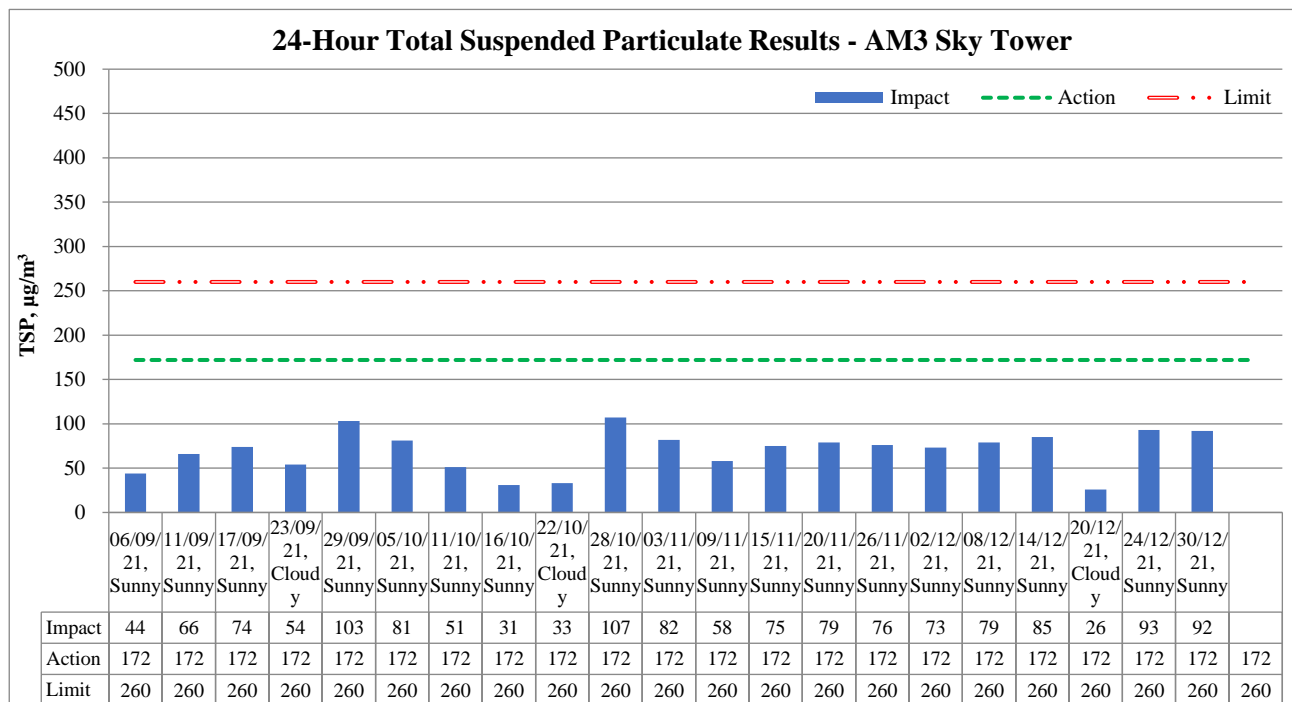
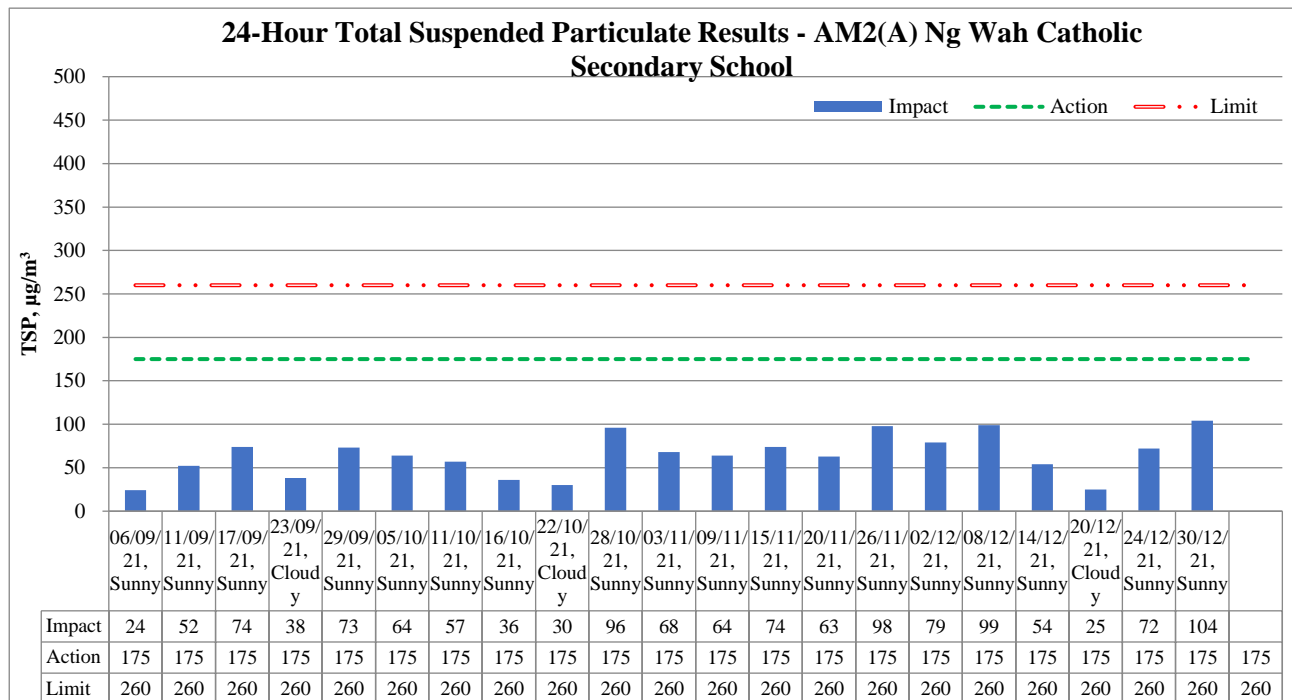
Location: AM2(A) – Ng Wah Catholic Secondary School

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			
2/12/2021	Sunny	22.3	1021.8	15.3602	15.5202	0.1600	6337.1	6361.1	1440	50	50	1.41	2033	79
8/12/2021	Sunny	21.8	1022.3	15.3784	15.5808	0.2024	6361.91	6385.92	1441	50	50	1.41	2036	99
14/12/2021	Sunny	18.0	1018.6	15.4902	15.6016	0.1114	6386.65	6410.66	1441	50	50	1.42	2046	54
20/12/2021	Cloudy	19.6	1017.6	17.8311	17.8817	0.0506	6410.92	6434.92	1440	50	50	1.42	2039	25
24/12/2021	Sunny	24.0	1017.2	15.2038	15.3503	0.1465	6436.17	6460.18	1441	50	50	1.40	2024	72
30/12/2021	Sunny	16.0	1024.6	15.5423	15.7562	0.2139	6461.26	6485.26	1440	50	50	1.43	2059	104
													Maximum	104
													Minimum	25
													Average	72
													Action Level	175
													Limit Level	260

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			
2/12/2021	Sunny	22.3	1021.8	14.9987	15.1613	0.1626	3805.07	3829.09	1441	54	54	1.54	2219	73
8/12/2021	Sunny	21.8	1022.3	18.3744	18.5243	0.1499	3830.24	3854.26	1441	46	46	1.31	1888	79
14/12/2021	Sunny	18.0	1018.6	18.3034	18.4651	0.1617	3855.09	3879.11	1441	46	46	1.32	1897	85
20/12/2021	Cloudy	19.6	1017.6	14.9824	15.0357	0.0533	3880.52	3904.55	1442	50	50	1.43	2058	26
24/12/2021	Sunny	24.0	1017.2	17.5981	17.7878	0.1897	3905.81	3929.83	1441	50	50	1.42	2042	93
30/12/2021	Sunny	16.0	1024.6	15.4292	15.6127	0.1835	3930.19	3954.21	1441	48	48	1.38	1993	92
													Maximum	93
													Minimum	26
													Average	75
													Action Level	172
													Limit Level	260

## 24-hour average TSP



Major Construction Activities	Reporting Period			
	Sept 2021	Oct 2021	Nov 2021	Dec 2021
Construction of box culvert	✓	✓	✓	
Bored pile works for landscape elevated walkway	✓	✓	✓	✓
Demolition of existing structure and cottage	✓			
Construction of project signboard	✓			
Pre-drilling works and trial pit excavation	✓	✓	✓	
Drainage works	✓			
Temporary road diversion at Sa Po Road		✓	✓	
Demolition of existing structure at SB-01		✓		
Pre-drilling work for S14 and KS10		✓		
Drainage works for Pedestrian Street No.1 & No.2		✓	✓	
Drainage works for Crowd Dispersal Route		✓	✓	
Instrumentation installation at SB-01			✓	✓
Pre-drilling work for S14			✓	✓
Removal existing piles at Road D1			✓	✓
Rising main construction			✓	✓
Trial pit excavation				✓
Advance works for traffic diversion at Sa Po Road				✓
Drainage works for Pedestrian Street No.1, No.2 & No.3				✓
Construction of Crowd Dispersal Route				✓

Factors might affect the monitoring results	Reporting Period			
	Sept 2021	Oct 2021	Nov 2021	Dec 2021
Non-project related construction activities in the adjacent construction sites were observed.	✓	✓	✓	✓

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

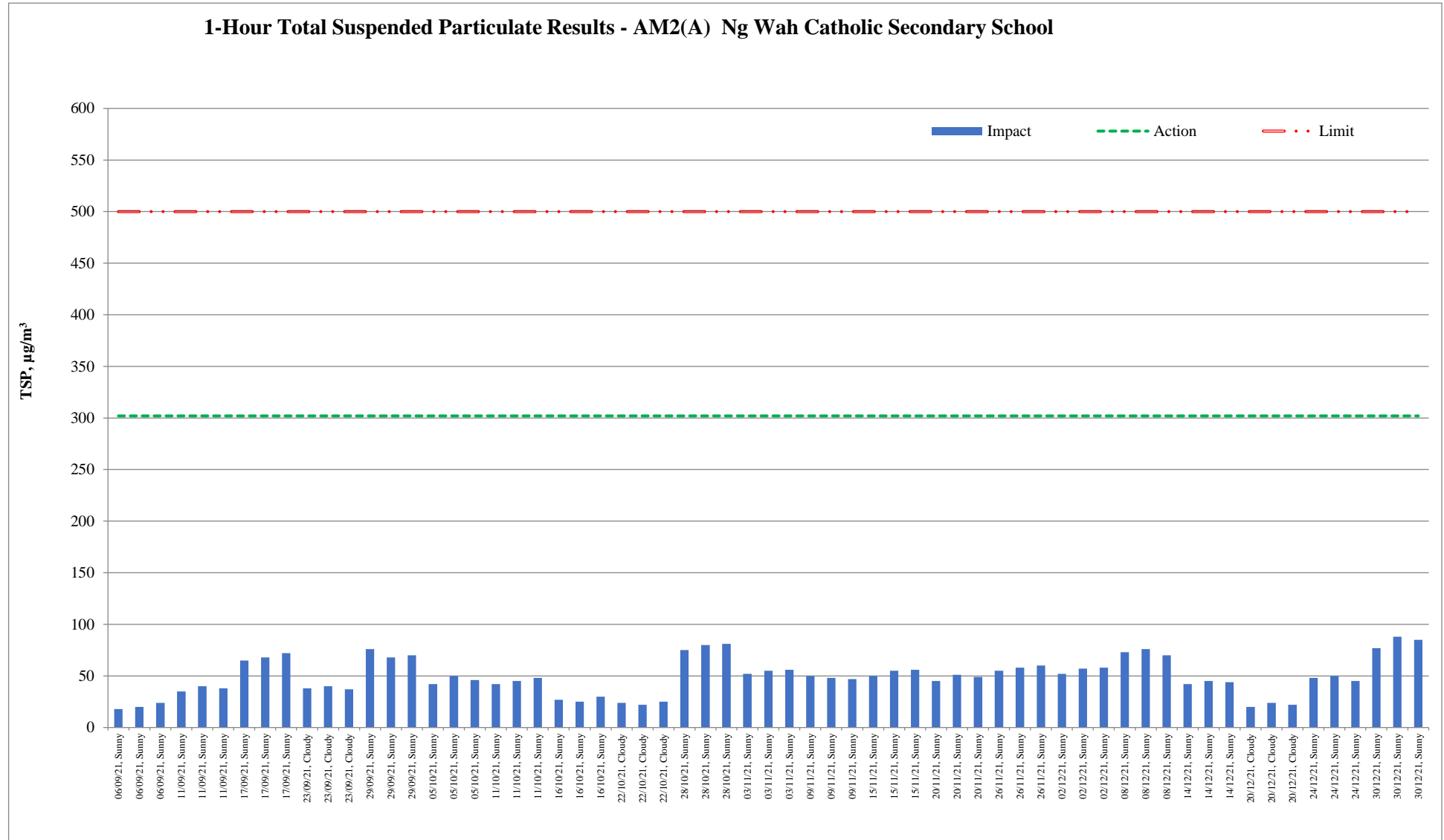
Location:  
**AM2(A) –  
 Ng Wah Catholic  
 Secondary School**

Date	Measurement Period			1-hr TSP concentration, $\mu\text{g}/\text{m}^3$	Weather
		-			
03/12/2021	13:00	-	14:00	52	Sunny
	14:00	-	15:00	57	
	15:00	-	16:00	58	
08/12/2021	09:00	-	10:00	73	Sunny
	10:00	-	11:00	76	
	11:00	-	12:00	70	
14/12/2021	13:00	-	14:00	42	Sunny
	14:00	-	15:00	45	
	15:00	-	16:00	44	
20/12/2021	09:00	-	10:00	20	Cloudy
	10:00	-	11:00	24	
	11:00	-	12:00	22	
24/12/2021	13:00	-	14:00	48	Sunny
	14:00	-	15:00	50	
	15:00	-	16:00	45	
30/12/2021	09:00	-	10:00	77	Sunny
	10:00	-	11:00	88	
	11:00	-	12:00	85	
Maximum				88	
Minimum				20	
Average				54	
Action Level				302	
Limit Level				500	

Location:  
**AM3 -  
 Sky Tower**

Date	Measurement Period			1-hr TSP concentration, $\mu\text{g}/\text{m}^3$	Weather
03/12/2021	09:00	-	10:00	45	Sunny
	10:00	-	11:00	46	
	11:00	-	12:00	49	
08/12/2021	13:00	-	14:00	53	Sunny
	14:00	-	15:00	53	
	15:00	-	16:00	56	
14/12/2021	09:00	-	10:00	61	Sunny
	10:00	-	11:00	64	
	11:00	-	12:00	60	
20/12/2021	13:00	-	14:00	21	Cloudy
	14:00	-	15:00	23	
	15:00	-	16:00	24	
24/12/2021	13:00	-	14:00	68	Sunny
	14:00	-	15:00	75	
	15:00	-	16:00	76	
30/12/2021	09:00	-	10:00	72	Sunny
	10:00	-	11:00	80	
	11:00	-	12:00	82	
Maximum				82	
Minimum				21	
Average				56	
Action Level				301	
Limit Level				500	

# 1-hour average TSP







Major Construction Activities	Reporting Period			
	Sept 2021	Oct 2021	Nov 2021	Dec 2021
Construction of box culvert	✓	✓	✓	
Bored pile works for landscape elevated walkway	✓	✓	✓	✓
Demolition of existing structure and cottage	✓			
Construction of project signboard	✓			
Pre-drilling works and trial pit excavation	✓	✓	✓	
Drainage works	✓			
Temporary road diversion at Sa Po Road		✓	✓	
Demolition of existing structure at SB-01		✓		
Pre-drilling work for S14 and KS10		✓		
Drainage works for Pedestrian Street No.1 & No.2		✓	✓	
Drainage works for Crowd Dispersal Route		✓	✓	
Instrumentation installation at SB-01			✓	✓
Pre-drilling work for S14			✓	✓
Removal existing piles at Road D1			✓	✓
Rising main construction			✓	✓
Trial pit excavation				✓
Advance works for traffic diversion at Sa Po Road				✓
Drainage works for Pedestrian Street No.1, No.2 & No.3				✓
Construction of Crowd Dispersal Route				✓

Factors might affect the monitoring results	Reporting Period			
	Sept 2021	Oct 2021	Nov 2021	Dec 2021
Non-project related construction activities in the adjacent construction sites were observed.	✓	✓	✓	✓

**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: $L_s$ 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: $L_{A1av}^{*5}$ The frequency weighting for the additional processing synchronizes with the frequency weighting of the sub-channel, so when the sub-channel has A-weighting, $L_{A1av}^{*5}$ 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 Sensitivity level -27 dB	Type UC-52 Sensitivity level -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 ( $L_p$ , $L_{eq}$ , $L_s$ , $L_{max}$ , $L_{min}$ , $L_{peak}$ : sampling frequency: 48 kHz) 100 ms ( $L_N$ )	
Calibration	Measurement Law: electrical calibration performed according to IEC and JIS standards, using internally generated signals; acoustic calibration performed with the NC-74.	
Correction functions	Windscreen correction: Compliant with IEC 61672-1 and JIS C 1509-1 standards when the windscreen is installed. Diffuse sound field correction: Correction of frequency characteristics in order to comply with standards (ANSI S1.4) in diffuse sound field.	
Delay time	The meter can be set to start measuring a specified time (OFF, 1, 3, 5 or 10 s) after the start button has been pressed or when a user-set trigger is exceeded.	
Back erase function	When the PAUSE key is pressed to pause measurement, the preceding (user selectable) 0, 1, 3 or 5 s data are excluded from processing.	
Display	Backlit semitransparent color TFT LCD display WQVGA (400 x 240 dots) * LCD with touch panel (Capacitive Touch Panel) Numerical display update frequency: 1 s Bar graph update frequency: 100 ms	
Store	Manual Number of data Internal memory: max. 1000 sets SD Card: depends on the capacity of the SD Card *1	Auto *2 Instantaneous values ( $L_p$ mode) and processed values ( $L_{eq}$ mode) are stored continuously and automatically at preset intervals. LP sampling cycle 100 ms, 200 ms, 1 s, $L_{eq}$ 1s Leq sampling cycle 10 s, 1, 5, 10, 15, 30 ms, 1, 8, 24 h Measurement Time Max. 1000 h (depends on the capacity of the SD Card) *1

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

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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).  
This leaflet is printed with environmentally friendly vegetable-based ink on recycled paper.

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 Processed value
Output interval	100 ms
Print out	Printing of measurement results on dedicated printer DPU-414
Power requirements	Four IEC R6 (size AA) batteries (alkaline or rechargeable batteries) or external power supply
Battery life (23 °C)	Alkaline battery LR6 (AA): 26 h Ni-MH secondary battery: 25 h At the maximum: * Depends on the setting
AC adapter	NC-98C (NC-34 for previous models cannot be used)
External power voltage	5 to 7 V (rated voltage: 6 V)
Current consumption	Approximately 90 mA (normal operation, rated voltage)
Ambient conditions	Temperature: -10 to +50 °C Humidity: 10 to 90 % RH (non-condensing)
Dustproof / water-resistant performance *4	IP code: IP54 (except for microphone) See precautions regarding waterproofing
Dimensions, weight	Approx. 250 (H) x 76 (W) x 33 mm (D), approx. 400 g (with batteries)
Supplied accessories	Storage case x 1, Windscreen WS-10 x 1, Windscreen fall prevention rubber x 1, Hand strap x 1, LR6 (AA) alkaline batteries x 4, SD card 512 MB x 1 (NX-42EX preinstalled model only)

## Options

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

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

### Precautions regarding waterproofing

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



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

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

# Calibration Certificate of Sound Level Meter

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



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

## 校准证书 CALIBRATION CERTIFICATE

证书编号: 2HB21001383-0001  
 Certificate No. 



中国认可  
国际互认  
校准  
CALIBRATION  
CNAS L13344

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

校准:  
Calibrated by 

签发:  
Approved by 

核验:  
Inspected by 

印章:  
Stamp

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

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

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

## 说明 DIRECTIONS

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

名称 (Description)	证书号/有效期/溯源单位 (Certificate No./Due Date/Traceability to)	技术指标 (Specification)	测量范围 (Measuring Range)
正弦信号发生器	4GC20000427-0010/2021-11-04/赛宝(广州)	f: 41mHz; 失真度 Distortion: <-70dB	f: 0.001Hz~200kHz; U : 100μV~5Vrms
数字多用表	4GC20000358-0060/2021-09-09/赛宝(广州)	DCV: ±0.0035%; ACV: ±0.06%; DCI: ±0.05%; ACI: ±0.1%; R: ±0.01%; f: ±0.001%	DCV:(0~1000)V; ACV:(0.001~750)V@(3Hz~300kHz); DCI:(0~3)A; ACI:(0~3)A@(3Hz~5kHz); R:(0~100)MΩ; f:3Hz~300kHz
步进衰减器	4GC21000155-0024/2022-04-29/赛宝(广州)	43dB	(0~110) dB/10dB step @(DC~1GHz)
PULSE分析系统	GFJGJL1001210202725/2022-03-03/航空304所	频率: $f_{max}=0.001\text{kHz} \times A^{-2}$ ; 电压: $U_{max}=0.04\text{V} \times A^{-2}$	频率:0.001Hz~51.2kHz; 电压: $(1 \times 10^{-3} \sim 30)\text{V}$
标准传声器	LSs2021-13180/2022-04-24/中国计量院	$U=(0.05 \sim 0.20)\text{dB} \times (A^{-2})$	20Hz~20kHz
前置放大器	LSs2021-11346/2022-03-07/中国计量院	$U=(0.3\text{dB} \times (A^{-2}))$	(10~20000) Hz
功率放大器	4GC20000457-0065/2021-11-17/赛宝(广州)	频率响应: ±1dB, 失真度: ≤0.2%	20Hz~20kHz
多功能声学校准器	4EC20000091-0005/2021-11-05/赛宝(广州)	1级	31.5Hz~16kHz
4. 校准地点(The calibration place):  
 广州市增城区朱村街朱村大道西78号9栋110室
5. 环境条件(Environmental conditions):  
 温度(Temperature): 23.4°C 相对湿度(Relative Humidity): 55.8%
6. 本证书中给出的扩展不确定度依据JJF1059.1-2012《测量不确定度的评定与表示》评定, 由合成标准不确定度乘以包含概率约为95%时对应的包含因子k得到。  
 The extended uncertainty given in this certificate is evaluated according to JJF1059.1-2012 "Evaluation and Expression of Uncertainty in Measurement", and is calculated by multiplying the combined standard uncertainty by the coverage factor k which corresponding to the coverage probability about 95%.
7. 证书中"P"、"合格"代表"测量结果在允许范围内", "F"、"不合格"代表"测量结果不在允许范围内", "N/A"代表"不适用或技术指标暂时无法确认等"。本证书报告的结论仅供参考, 使用人员应结合实际测量的要求合理使用, 如考虑测量结果测量不确定度的影响等。  
 "P" and "Pass" in this certificate stand for "Low Limit≤the measured value ≤High Limit", "F" and "Fail" stand for "the measured value < Low Limit or the measured value > High Limit", "N/A" stands for "Not Applicable or The technical specification has not been confirmed etc".The conclusions of this certificate are for reference only. Users should use them reasonably according to the actual measurement requirements, such as considering the impact of measurement uncertainty, etc.
8. 建议校准周期是本实验室依据本证书报告的技术依据和仪器设备常规使用条件给出的建议, 供委托方参考。委托方可以根据实际使用情况自行决定样品的校准周期。

赛宝计量检测中心  
 广州总部地址: 广州市增城区朱村街朱村大道西78号  
 客服电话: 020-87237633 传真: 020-87236189  
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# Calibration Certificate of Sound Level Meter



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

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

无影响证书中测量结果准确度的因素和缺陷。

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

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

频率(Frequency)=1000Hz

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

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

### 3 级线性 (Level Linearity)

#### 3.1 参考量程 (Reference Range)

频率(Frequency): 8000Hz

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

#### 3.2 其它级量程 (Other Range)

频率(Frequency): 1000Hz

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

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

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

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

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## Calibration Certificate of Sound Level Meter



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

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

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

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

### 6 自生噪声 (Autogenous noise)

计权 (Weighting)	实测值 (Actual) (dB)
A	15.3

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## 说 明 DIRECTIONS

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

2. 本次校准的技术依据及CNAS认可范围(Reference documents and CNAS accredited scopes):

- JJG 188-2017 声级计检定规程: Sound pressure level: (20~130)dB; Frequency Weighting: (20~130)dB@(10 Hz~20kHz).
- 详细内容请查看CNAS网站中注册编号为L13344的证书附件，超出范围的内容未被认可，其结果/结论所依据的合格评定活动不在认可范围内。(Please see the attachment of certificate No. L13344 at CNAS website for details, beyond which is not accredited, the conformity assessment activities on which the results/conclusions are based are outside the scope of accreditation.)

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

名称 (Description)	证书号/有效期/溯源单位 (Certificate No./Due Date/Traceability to)	技术指标 (Specification)	测量范围 (Measuring Range)
数字多用表	4GC20000467-0001/2021-11-26/赛宝(广州)	DCV: $\pm 0.0035\%$ ; ACV: $\pm 0.06\%$ ; DCI: $\pm 0.05\%$ ; ACI: $\pm 0.1\%$ ; R: $\pm 0.01\%$ ; f: $\pm 0.001\%$	DCV:(0~1000)V; ACV: (0.001~750)V@(3Hz~300kHz); DCI:(0~3)A; ACI:(0~3)A@(3Hz~5kHz); R:(0~100)M $\Omega$ ; f: 3Hz~300kHz
正弦信号发生器	4GC20000427-0010/2021-11-04/赛宝(广州)	f: $\pm 1\text{mHz}$ ; 失真度 Distortion: $< -70\text{dB}$	f: 0.001Hz~200kHz; U: 100 $\mu\text{V}$ ~5Vrms
标准传声器	LSsx2021-13180/2022-04-24/中国计量院	U=(0.05~0.20)dB (k=2)	20Hz~20kHz
前置放大器	LSsx2021-13000/2022-04-19/中国计量院	U=0.3dB (k=2)	(10~50000) Hz
PULSE分析系统	4GC21000026-0375/2022-01-21/赛宝(广州)	频率: $U_{rel}=0.001\%$ , k=2; 电压: $U_{rel}=0.04\%$ , k=2	频率: 0.001Hz~51.2kHz; 电压: $(1 \times 10^{-7} \sim 30)\text{V}$
声级校准器	LSsx2021-11345/2022-03-07/中国计量院	1级	94dB, 114dB@ (1000Hz)
功率放大器	4GC20000457-0065A/2021-11-17/赛宝(广州)	频率响应: $\pm 1\text{dB}$ , 失真度: $\leq 0.2\%$	20Hz~20kHz
步进衰减器	4GC21000155-0024/2022-04-29/赛宝(广州)	$\pm 3\text{dB}$	(0~110) dB/10dB step @ (DC~1GHz)
声校准器	4GC20000502-0050/2021-12-21/赛宝(广州)	1级 First Level	31.5Hz~16kHz

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

5. 环境条件(Environmental conditions):  
温度(Temperature): 23.9°C 相对湿度(Relative Humidity): 55.8%

6. 本证书中给出的扩展不确定度依据JJF 1059.1-2012《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 JJF 1059.1-2012 "Evaluation and Expression of Uncertainty in Measurement", and is calculated by multiplying the combined standard uncertainty by the coverage factor k which corresponding to the coverage probability about 95%.

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

Sound Calibrator NC-75



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

# Sound Calibrator NC-75

Patent pending



- Integrated newly developed reference microphone enables feedback control that completely eliminates the need for atmospheric pressure and coupler volume correction, resulting in highly accurate and reliable calibration.
- Effective coupler sound insulation (30 dB or higher\*) permits calibration also in relatively noisy environments.  
\*A-weighted sound level insulation performance measured with pink noise
- Each product comes standard with a JCSS Calibration Certificate, demonstrating high quality.

- Conforming with IEC 60942: 2017 class 1 and JIS C 1515: 2020
- Supports calibration of RION sound level meters compliant with IEC 61672-1: 2013, JIS C 1509-1: 2017 and JIS C 1516: 2014.
- Supports calibration of RION microphones and microphones of other manufacturers meeting the size specifications of IEC 61094-4.
- Supports 1-inch, 1/2-inch, and 1/4-inch microphones (1/4 inch with optional adapter)

### JCSS Calibration Certificate

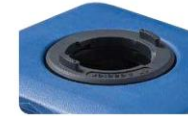


### JCSS Calibration Results



### How to use the adapter

- **1-inch microphones**  
To use the sound calibrator with 1-inch diameter microphones, remove the 1/2-inch microphone adapter.
- **1/2-inch microphones**  
To use the sound calibrator with 1/2-inch diameter microphones, the supplied 1/2-inch microphone adapter must be in place.  
Make sure the 1/2-inch adapter is locked.
- **1/4-inch microphones**  
To use the sound calibrator with 1/4-inch diameter microphones, use the supplied 1/2-inch microphone adapter together with the optional 1/4-inch adapter.



Usage example

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

Applicable standards	IEC 60942: 2017 class 1, ANSI/ASA S1.40-2006 class 1, JIS C 1515: 2020 class 1, CE marking, WEEE directive, Chinese RoHS
Supported microphones	Microphones made by RION and microphones made by other manufacturers that meet the IEC 61094-4 size specifications 1-inch microphones 1/2-inch microphones (with supplied adapter) 1/4-inch microphones (with optional adapter)
Nominal sound pressure level	94 dB
Sound pressure level tolerance	Max. ±0.20 dB
Nominal frequency	1 000 Hz
Frequency tolerance	Max. ±0.1%
THD + noise	Max. 1.0 % (22.4 Hz to 22.4 kHz)
Dimensions and weight	Approx. 42 mm (H) x 77 mm (W) x 70 mm (D), approx. 200 g
Power supply	IEC LR6 (size AA) alkaline battery x 2 IEC LR6 (size AA) nickel-hydrate rechargeable battery ("eneloop pro" supported) x 2
Battery life	50 hours or more (using two alkaline batteries, continuous use) 50 hours or more (using two nickel-hydrate rechargeable batteries (eneloop pro), continuous use)
Supplied accessories	Soft case x 1, 1/2-inch microphone adapter x 1, IEC LR6 (size AA) alkaline battery x 2, hand strap x 1, JCSS Calibration Certificate x 1
* RION standard ambient conditions: static pressure 101.325 kPa, ambient temperature 23 °C, relative humidity 50 %	
Optional accessories	1/4-inch microphone adapter NC-75-S11

### Strap



Securely carry the unit with the supplied hand strap

### Soft case



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

### PISTONPHONE NC-72A



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

Applicable standards	IEC 60942: 2017 class L5/M, class 1/M, JIS C 1515: 2020 class L5/M, class 1/M
Nominal sound pressure level	114 dB, Sound pressure level tolerance ±0.10 dB

**JCSS** RION CO., LTD. is recognized by the JCSS which uses ISO/IEC 17025 as an accreditation standard and bases its accreditation scheme on ISO/IEC 17011. JCSS is operated by the accreditation body (IA Japan) which is a signatory to the Asia Pacific Accreditation Cooperation (APAC), as well as the International Laboratory Accreditation Cooperation (ILAC). The Quality Assurance Section of RION CO., LTD. is an international MHA compliant JCSS operator with the accreditation number JCSS 0197.



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

Distributed by:

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

3-20-41, Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan  
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This leaflet is printed with environmentally friendly UV ink.

1709-B 2003.PD

## Calibration Certificate of Sound Calibrator





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

# 校准证书

## CALIBRATION CERTIFICATE

证书编号: 2HB21001749-0002  
Certificate No. 



委托单位: Castco Testing Centre Limited  
Client

仪器名称: Sound Level Calibrator  
Description

型号规格: NC-75  
Model/Type

制造商: RION  
Manufacturer

机身号: 34280310  
Serial No.

管理号: AAST-SLC-07  
Asset No.

接收日期: 2021-08-05 校准日期: 2021-08-17  
Rec. Date Cal. Date

签发日期: 2021-08-18 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

校准: 赵文钰  
Calibrated by

签发: 郑木力  
Approved by

核验: 张毅  
Inspected by

印章:  
Stamp

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

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

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

# 说明

## DIRECTIONS

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

名称 (Description)	证书号/有效期/溯源单位 (Certificate No./Due Date/Traceability to)	技术指标 (Specification)	测量范围 (Measuring Range)
标准传声器	LS6x2021-13180/2022-04-24/中国计量院	$U=0.05-0.20\text{dB} (k=2)$	10Hz~20kHz
PULSE分析系统	4GC21000026-0375/2022-01-21/赛宝(广州)	频率: $U_{rel}=0.001\%,k=2$ ;电压: $U_{rel}=0.04\%,k=2$	频率:0.001Hz~51.2kHz; 电压:( $1 \times 10^{-3}$ ~30)V
前置放大器	LSx2021-13000/2022-04-19/中国计量院	$U=0.3\text{dB} (k=2)$	(10~50000) Hz
4. 校准地点(The calibration place):  
广州市增城区朱村街朱村大道西78号9栋110室
5. 环境条件(Environmental conditions):  
温度(Temperature): 22.9°C 相对湿度(Relative Humidity): 59.5%
6. 本证书中给出的扩展不确定度依据JJF1059.1-2012《测量不确定度的评定与表示》评定, 由合成标准不确定度乘以包含概率约为95%时对应的包含因子k得到。  
The extended uncertainty given in this certificate is evaluated according to JJF1059.1-2012 "Evaluation and Expression of Uncertainty in Measurement", and is calculated by multiplying the combined standard uncertainty by the coverage factor k which corresponding to the coverage probability about 95%.
7. 证书中"P"、"合格"代表"测量结果在允许范围内", "F"、"不合格"代表"测量结果不在允许范围内", "N/A"代表"不适用或技术指标暂时无法确认等"。本证书报告的结论仅供参考, 使用人员应结合实际测量的要求合理使用, 如考虑测量结果测量不确定度的影响等。  
"P" and "Pass" in this certificate stand for "Low Limit≤the measured value ≤High Limit", "F" and "Fail" stand for "the measured value < Low Limit or the measured value > High Limit", "N/A" stands for "Not Applicable or The technical specification has not been confirmed etc".The conclusions of this certificate are for reference only. Users should use them reasonably according to the actual measurement requirements, such as considering the impact of measurement uncertainty, etc.
8. 建议校准周期是实验室依据本证书报告的技术依据和仪器设备常规使用条件给出的建议, 供委托方参考。委托方可以根据实际使用情况自行决定样品的校准周期。  
The reference calibration period is based on the reference documents and normal operating conditions of the calibrated instrument. It is only for reference. The client may decide the calibration period of the instrument according to the actual use.

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

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

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# Calibration Certificate of Sound Calibrator



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

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

无影响证书中校准结果准确度的因素和缺陷。

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

**2 声压级 (Sound Pressure Level)**

规定声压级 (Prescribed SPL)	测量声压级 (Measured SPL)	声压级差的绝对值 (Absolute value of SPL)	允许范围 (Limit)	结论 (Pass/Fail)	$U$ ( $k=2$ )
(dB)	(dB)	(dB)	(dB)		(dB)
94	94.12	0.12	≤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	1000.0	0.00	≤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	0.15	≤3.00	P	5.0

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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>1,2</sup> ±5% of reading or ±0.025 m/s (±5 ft/min), whichever is greater  
 Accuracy (TA430, TA440)<sup>1,2</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)

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 459209 Germany Tel: +49 241 523030  
 France Tel: +33 491 11 87 64

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#### Time Constant (TA430, TA440)

User selectable

#### External Meter Dimensions

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

#### Meter Weight with Batteries

0.27 kg (0.6 lbs.)

#### Meter Probe Dimensions

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

#### Articulating Probe Dimensions

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

#### Power Requirements

Four AA-size batteries or AC adapter

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

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

<sup>2</sup>The accuracy statement begins at 30 ft/min through 4000 ft/min (0.15 m/s through 20 m/s) for the Model TA410, and 30 ft/min through 6,000 ft/min (0.15 m/s through 30 m/s) for Models TA430 and TA440.

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

<sup>4</sup>Accuracy with probe at 25°C (77°F). Add uncertainty of 0.2% RH (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.



## 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  
 Year Month Day

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

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

核验员:  
 Checked by 张吉庆 张吉庆

校准员:  
 Calibrated by 蒋新建 蒋新建

(证书专用章)  
 Stamp

该二维码非公众号



扫码查看证书信息 (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浦华科技园厂房 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.szdhl.com 电子邮箱: szdhl@163.com

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



# 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.

## 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 RGIV2019-0007	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

- 校准地点: 本公司力学实验室  
Operation Location
- 环境条件: 温度 21.7 °C 相对湿度 60 % 大气压 1010.0 hPa  
Operation Environment Temperature °C RH



**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**



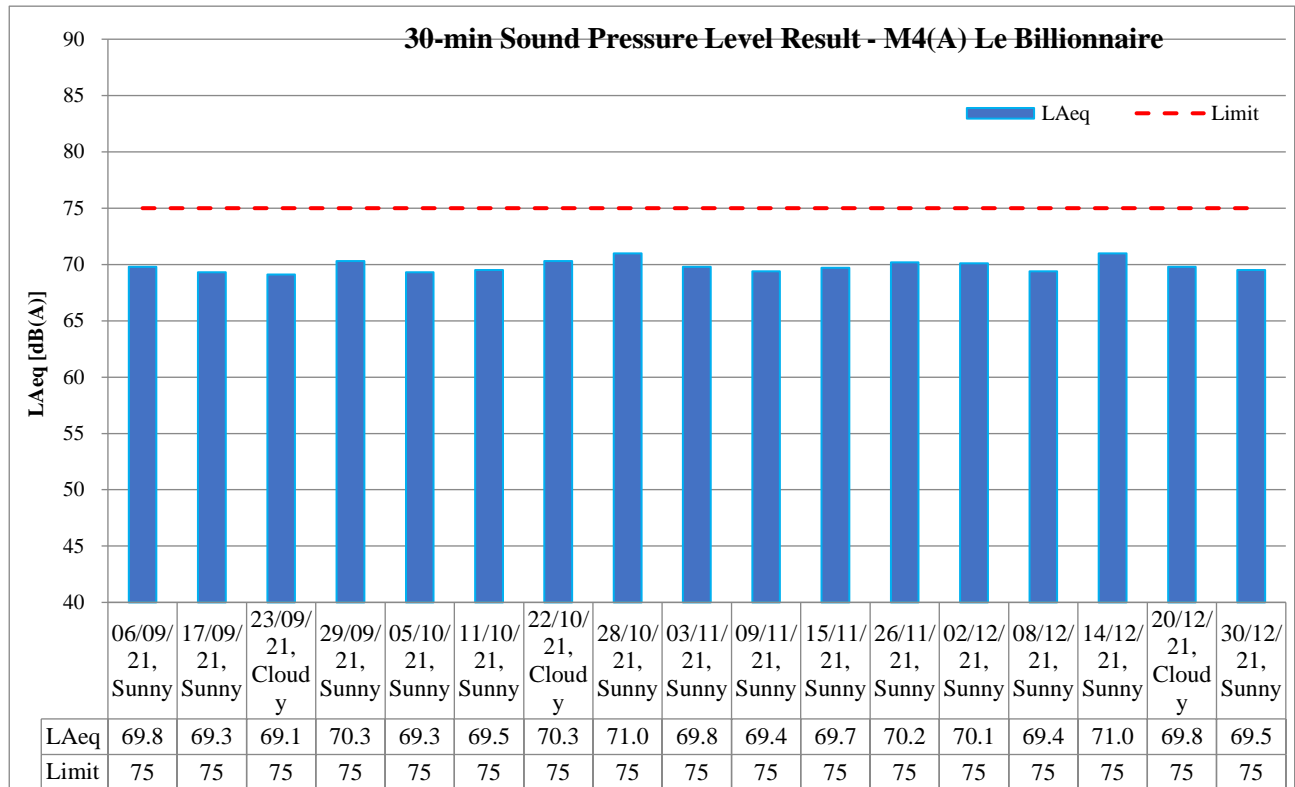
**M4(A) – Le Billionnaire**

Date	Temp (°C)	Weather	Measured Noise Level at M4(A), dB(A)							Limit
			Time		Baseline	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>		
2/12/2021	22.3	Sunny	13:25	-	13:55	69.5	70.1	71.5	68.8	75
8/12/2021	21.8	Sunny	09:25	-	09:55	69.5	69.4	70.8	68.3	75
14/12/2021	18.0	Sunny	09:14	-	09:44	69.5	71.0	72.2	69.4	75
20/12/2021	19.6	Cloudy	13:20	-	13:50	69.5	69.8	71.4	68.1	75
30/12/2021	16.0	Sunny	09:35	-	10:05	69.5	69.5	71.1	68.6	75
							Maximum	71.0		
							Minimum	69.4		
							Average	70.0		

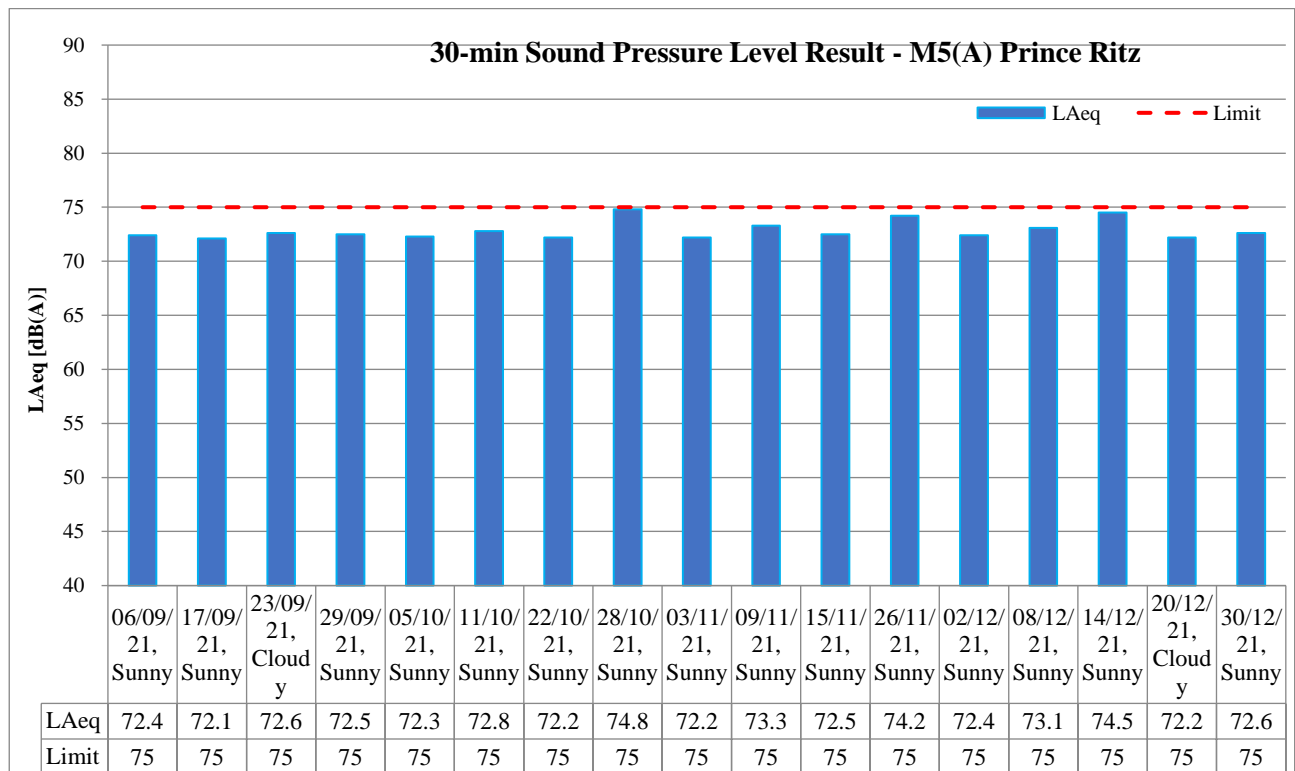
**M5(A) – Prince Ritz**

Date	Temp (°C)	Weather	Measured Noise Level at M5(A), dB(A)							Limit
			Time		Baseline	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>		
2/12/2021	22.3	Sunny	14:30	-	15:00	72.5	72.4	73.6	70.2	75
8/12/2021	21.8	Sunny	10:35	-	11:05	72.5	73.1	74.5	71.6	75
14/12/2021	18.0	Sunny	10:44	-	11:14	72.5	74.5	76.0	72.4	75
20/12/2021	19.6	Cloudy	14:25	-	14:55	72.5	72.2	73.1	70.5	75
30/12/2021	16.0	Sunny	10:40	-	11:10	72.5	72.6	73.8	70.7	75
							Maximum	74.5		
							Minimum	72.2		
							Average	73.0		

**L<sub>Aeq</sub>, 30-min graphical results of M4(A) – Le Billionnaire**



**L<sub>Aeq</sub>, 30-min graphical results of M5(A) – Prince Ritz**



Major Construction Activities	Reporting Period			
	Sept 2021	Oct 2021	Nov 2021	Dec 2021
Construction of box culvert	✓	✓	✓	
Bored pile works for landscape elevated walkway	✓	✓	✓	✓
Demolition of existing structure and cottage	✓			
Construction of project signboard	✓			
Pre-drilling works and trial pit excavation	✓	✓	✓	
Drainage works	✓			
Temporary road diversion at Sa Po Road		✓	✓	
Demolition of existing structure at SB-01		✓		
Pre-drilling work for S14 and KS10		✓		
Drainage works for Pedestrian Street No.1 & No.2		✓	✓	
Drainage works for Crowd Dispersal Route		✓	✓	
Instrumentation installation at SB-01			✓	✓
Pre-drilling work for S14			✓	✓
Removal existing piles at Road D1			✓	✓
Rising main construction			✓	✓
Trial pit excavation				✓
Advance works for traffic diversion at Sa Po Road				✓
Drainage works for Pedestrian Street No.1, No.2 & No.3				✓
Construction of Crowd Dispersal Route				✓

Factors might affect the monitoring results	Reporting Period			
	Sept 2021	Oct 2021	Nov 2021	Dec 2021
Non-project related construction activities in the adjacent construction sites were observed.	✓	✓	✓	✓

**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	1. Check final design conforms to the requirements of EP and prepare report.	1. Check report. 2. Recommend remedial design if necessary.	1. Undertake remedial design if necessary.	
Non-conformity on one occasion	1. Identify Source. 2. Inform IEC and Supervisor /ER. 3. Discuss remedial actions with IEC, Supervisor /ER and Contractor. 4. Monitor remedial actions until rectification has been completed.	1. Check report. 2. Check Contractor's working method. 3. Discuss with ET and Contractor on possible remedial measures. 4. Advise Supervisor /ER on effectiveness of proposed remedial measures. 5. Check implementation of remedial measures.	1. Notify Contractor. 2. Ensure remedial measures are properly implemented.	1. Amend working methods. 2. Rectify damage and undertake any necessary replacement.
Repeated Non-conformity	1. Identify Source. 2. Inform IEC and Supervisor /ER. 3. Increase monitoring frequency. 4. Discuss remedial actions with IEC, Supervisor /ER and Contractor. 5. Monitor remedial actions until rectification has been completed. 6. If non-conformity stops, cease additional monitoring.	1. Check monitoring report. 2. Check Contractor's working method. 3. Discuss with ET and Contractor on possible remedial measures. 4. Advise Supervisor /ER on effectiveness of proposed remedial measures. 5. Supervise implementation of remedial measures.	1. Notify Contractor. 2. Ensure remedial measures are properly implemented.	1. Amend working methods. 2. Rectify damage and undertake any necessary replacement.



**Appendix N – Waste Flow Table**

**MONTHLY SUMMARY WASTE FLOW TABLE FOR 2021 (YEAR)**

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Borken Concrete (4)	Reused in the Contract	Reused in other Projects	Disposal as Public Fill	Import Fill	Metals	Paper / Cardboard Packaging	Plastics (3)	Chemical Waste	Other, 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 '000kg]	[in '000kg]	[in '000kg]	[in '000kg]	[in '000m <sup>3</sup> ]
JAN	0.191597506	0.028739612	0	0	0.162857895	0	0	0	0	0	0.007013333
FEB	1.108290924	0.166243555	0	0	0.942047368	0	0	0	0	0	0.011833333
MAR	0.416297177	0.062444545	0	0	0.353852632	0	0	0	0	0	0.017520000
APR	0.020390091	0.003058512	0	0	0.017331579	0	0	0	0	0	0.002420000
MAY	0.230390073	0.034558494	0	0	0.195831579	0	0	0	0	0	0.189360000
JUNE	0.299331150	0.194899576	0	0	1.104431579	0	0	0	0	0	0.006900000
SUB-TOTAL	2.266296921	0.489944294	0	0	2.776352632	0	0	0	0	0	0.235046666
JULY	0.992681027	0.14890208	0	0	0.843778947	0	0	0	0	0	0.009193333
AUG	0.800414791	0.120062159	0	0	0.680352632	0	0	0	0	0	0.008226667
SEPT	0.192557259	0.028883574	0	0	0.163673684	0	0	0	0	0	0.007060000
OCT	0.146749213	0.022012371	0	0	0.124736842	0	0	0	0	0	0.001333333
NOV	0.095975223	0.014396276	0	0	0.081578947	0	0	0	0	0	0.003706667
DEC	0.156656333	0.023498438	0	0	0.133157895	0	0	0	0	0	0.009086667
TOTAL	4.651330767	0.847699192	0	0	4.803631579	0	0	0	0	0	0.273653333

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

**Reporting Month: December 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/2018/05	No	No	No

**Cumulative Statistics on Complaints, Notification of Summons and Successful Prosecutions up to 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/2018/05	1	0	0

<b>Complaint Log for ED/2018/05</b>				
Complaint Ref. No.	Date of Complaint	Description of Complaint	Investigation / Recommendations / Actions	Close-Out Date / Status