

# FUGRO TECHNICAL SERVICES LIMITED

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## 70<sup>th</sup> CONSOLIDATED MONTHLY EM&A REPORT

August 2022

**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/1167

**Prepared by** : Toby Wan

**Reviewed by** : Cyrus Lai

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

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**EXECUTIVE SUMMARY**

- i. This is the 70<sup>th</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 August and 31 August 2022.
- 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:**

- Install lift inside the lift shaft of LT1 at SKLR Playground
- Carry out finishing works & E&M works inside subway
- Reinstate the road and drain at TTA stage 3 & Stage 4-3 of PERE
- Relocation of material storage yard and workshop

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

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

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

- Pile column construction for PC9, PC10 and PC11 for Elevated Walkway LW-02
- Erection of falseworks and working platform for decking of Elevated Walkway LW-02
- UU diversion at Sa Po Road under TTA Stage 2A
- Sheetpile installation at Sa Po Road under TTA Stage 2A
- RC construction at launching shaft for subway SB-01
- Construction works for Pedestrian Street No. 2
- Construction works for Road L16

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- Construction of DCS
- RC construction for Subway KS10 Lift and Staircase
- Renovation works for existing subways KS9 and KS32

### **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, Contract No. ED/2018/01 and Contract No. ED/2018/05 in this reporting month.

### **Reporting Changes**

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



**Future Key Issues**

viii. 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 69<sup>th</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 July and 31 July 2022.

### 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)	Engineer	Mr. Ricky Yu	3579 2124	3579 4516
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. Pang Chan	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)	Permit Holder	Mr. Lam Shing Tim	3842 7090	2739 0076
Engineer's Representative (AECOM)	Supervisor's Delegate	Mr. Vincent Lee	2798 0771	2798 0783
IEC (Acuity)	IEC	Mr. Kevin Li	9779 2247	2698 9383
ET (Ka Shing)	ET Leader	Mr. Pang Chan	6082 2973	2120 7752
Main Contractor (BK- STEC)	EO	Mr. Rex Lau	6282 5154	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:**

- Install lift inside the lift shaft of LT1 at SKLR Playground
- Carry out finishing works & E&M works inside subway
- Reinstate the road and drain at TTA stage 3 & Stage 4-3 of PERE
- Relocation of material storage yard and workshop

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

- North Approach Ramp – Construction of utilities trough
- Bridge D3 – Construction of Bridge Deck
- North Depressed Road – Construction of wall & top slab
- Underpass – Construction of upstand wall
- South Approach Ramp – Construction of Permanent Structure
- District Cooling System seawater intake box culvert - reinstatement of the seawall and



backfilling works

- Lift 3 – Modification works
- Lift 4 – Construction of lift shaft
- South Depressed Road – construction of permanent works
- Rising Main and Water Pipe – Laying of sewage
- Landscaped Deck – Installation of columns, construction of Landscaped Deck
- Transformer Room - Construction of permanent structure
- Shing Kai Road – Modification works, laying of storm water drainage pipes
- Lift 1 & 2 – Installation of ELS system
- CLP substation – Construction of wall & intermediate slab, permeant structure
- Noise Barrier – Remaining works, Bus lay-by construction
- Seawater Intake Box Culvert of Saltwater Pumping Station –Installation of sheetpiles and ELS system

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

- Pile column construction for PC9, PC10 and PC11 for Elevated Walkway LW-02
- Erection of falseworks and working platform for decking of Elevated Walkway LW-02
- UU diversion at Sa Po Road under TTA Stage 2A
- Sheetpile installation at Sa Po Road under TTA Stage 2A
- RC construction at launching shaft for subway SB-01
- Construction works for Pedestrian Street No. 2
- Construction works for Road L16
- Construction of DCS
- RC construction for Subway KS10 Lift and Staircase
- Renovation works for existing subways KS9 and KS32



**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 • Provide sufficient mitigation measures as recommended in Approved EIA Reports.
<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 ( $\mu\text{g}/\text{m}^3$ )	Range ( $\mu\text{g}/\text{m}^3$ )	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level ( $\mu\text{g}/\text{m}^3$ )
<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	42.1	23.1 – 66.0	346	500
24-hr TSP	AM2(A)	49.3	12.9 – 120.5	157	260
<b>Contract No. ED/2018/01:</b>					
24-hr TSP	AM3	39	20 – 58	182	260
	AM4(A)	47	33 – 69	187	
	AM7	41	28 – 73	181	
1-hr TSP	AM3	38	30 – 55	297	500
	AM4(A)	43	35 – 59	326	
	AM7	36	22 – 66	315	
<b>Contract No. ED/2018/05:</b>					
24-hr TSP	AM2(A)	33	21 – 43	175	260
	AM3	39	20 – 58	172	
1-hr TSP	AM2(A)	31	18 – 41	302	500
	AM3	38	30 – 55	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 <sub>(30min)</sub> 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)	59.7 – 75.1 #		75	
M4	73.1 – 76.0 #		70*	
M5(C)	73.5 – 79.1 #		75	
<b>Contract No. ED/2018/01:</b>				
M11	61.1 – 69.6		75	
M12	59.9 – 68.3		75	
<b>Contract No. ED/2018/05:</b>				
M4(A)	69.2 – 69.8		75	
M5(A)	72.1 – 73.4	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	0	NA
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 T&C at Lift LT4 at Road D1
- Carry out finishing works & E&M works inside subway
- Implement TTA stage 2 & Stage 4-2 of PERE
- Relocation of material storage yard and workshop
- Reinstatement works at SKLR Playground

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

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

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

- Pile column construction for PC9, PC10 and PC11 at Elevated Walkway LW-02
- Erection of falsework and working platform for decking of Elevated Walkway LW-02
- Construction of Crowd Dispersal Route
- Construction of Road L16
- Construction of DCS
- Construction works for Pedestrian Street No. 2
- UU diversion works at Sa Po Road
- Sheetpile installation at Sa Po Road under TTA Stage 2A
- RC construction for launching shaft for subway SB-01



- Renovation works for existing subway KS9 and KS32
- RC construction for Subway KS10 Lift and Staircase
- Twin rising main connection works

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>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,	<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> </ul>





Major Impact Prediction	Control Measures
Chemical and Waste Management, Landscape and Visual	<ul style="list-style-type: none"> <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>
<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 the appendices of the corresponding Monthly EM&A.

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### 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, Contract No. ED/2018/01 and Contract No. ED/2018/05 in this reporting month.
- 7.1.5 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/B**

**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

August 2022

(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: 07-09-2022

07-09-2022

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 August 2022 (version 1.0)**

Reference is made to the Environmental Team's submission of the draft Monthly EM&A Report (version 1.0) for August 2022 provided to Independent Environmental Checker (IEC) via email dated on 7-9-2022 for review and comment.

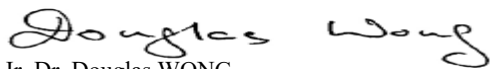
Please be informed that IEC has no adverse comment on the captioned submission. IEC writes to verify the captioned submission in accordance with Specific Condition 2.2 of the Environmental Permit No. 337/2009 and 445/2013/B.

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 77<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/B (“Kai Tak Development – Roads D3A & D4A”) respectively. This report documents the findings of EM&A Works conducted in August 2022.
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; further amendment of Environmental Permit (No.: EP-445/2013/B) issued on 3 May 2022).
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. The Environmental Permit (No.: EP-445/2013/A) was further amended and the Environmental Permit (No.: EP-445/2013/B) was issued on 3 May 2022.
- 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/B).
- 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 77<sup>th</sup> Monthly EM&A report summarizing the EM&A works for the Project in August 2022.
- 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. Ricky Yu	Engineer	3579 2124	3579 4516
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 August 2022 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 August 2022 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 4, 12, 19, 26 & 31 August 2022 in the reporting month. IEC joint site inspection was conducted on 31 August 2022. 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 Apr 2009	N/A	Construction of new distributor roads serving the planned Kai Tak development.	Valid
EP-445/2013/A	13 Aug 2014	N/A	Construction of Kai Tak Development roads D3A and D4A	Valid
<b>Effluent Discharge License</b>				
WT00023634-2016	--	31 Mar 2021	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 Mar 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 Jun 2020	13 Dec 2020	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 Dec 2020
GW-RE0639-20	3 Aug 2020	19 Jan 2021		Expired on 19 Feb 2021
GW-RE0045-21	20 Jan 2021	19 Jul 2021		Expired on 19 Jul 2021
GW-RE0656-21	9 Jul 2021	30 Sep 2021		Expired on 30 Sep 2021
GW-RE0717-21	30 Jul 2021	19 Jan 2022		Expired on 19 Jan 2022

### 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. September and October 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 August 2022.

#### 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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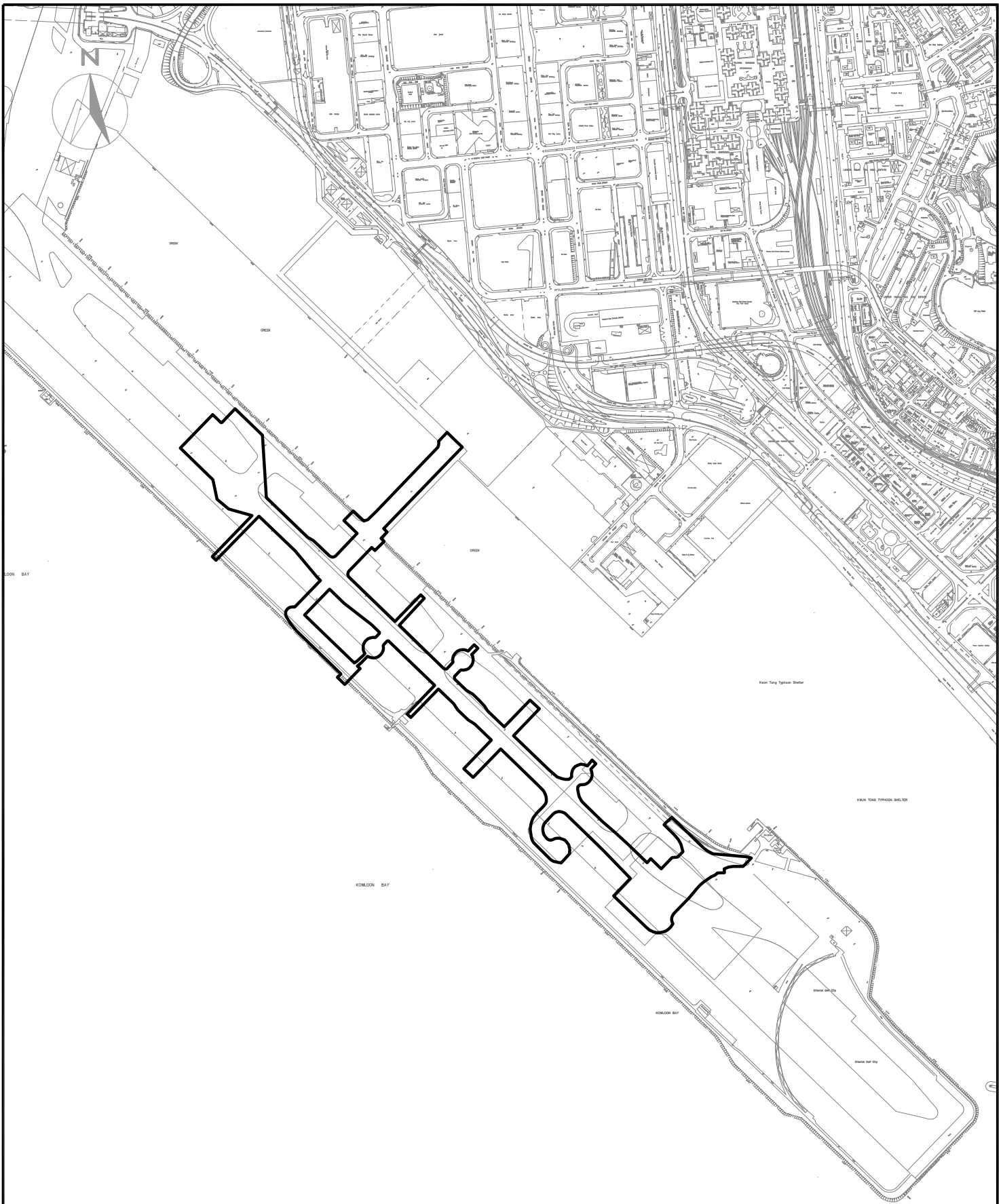
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## FIGURES

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LEGEND:	
	SITE BOUNDARY



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**

Monitoring Station	Parameter	Action Level ( $\mu\text{g}/\text{m}^3$ )	Limit Level <sup>(1)(2)</sup> ( $\mu\text{g}/\text{m}^3$ )
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**

Time Period	Action Level	Limit Level <sup>(1)(2)</sup>
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: August 2022

**(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**


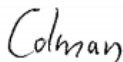
**EP-337/2009 & EP-445/2013/B**

**Weekly Site Inspection Record Summary**

**Inspection Information**

Checklist Reference Number	220804
Date	4 August 2022 (Thursday)
Time	14:30 – 15:30

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.: 220727).	

	Name	Signature	Date
Recorded by	Echo Hung		4 August 2022
Checked by	Colman Wong		5 August 2022

**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/B**

**Weekly Site Inspection Record Summary**

**Inspection Information**

Checklist Reference Number	220812
Date	12 August 2022 (Friday)
Time	14:30 – 15:30

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.: 220804).	

	Name	Signature	Date
Recorded by	Echo Hung		12 August 2022
Checked by	Colman Wong		15 August 2022



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

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


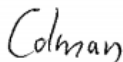
**EP-337/2009 & EP-445/2013/B**

**Weekly Site Inspection Record Summary**

**Inspection Information**

Checklist Reference Number	220819
Date	19 August 2022 (Friday)
Time	14:30 – 15:30

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.: 220812).	

	Name	Signature	Date
Recorded by	Echo Hung		19 August 2022
Checked by	Colman Wong		22 August 2022

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

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


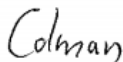
**EP-337/2009 & EP-445/2013/B**

**Weekly Site Inspection Record Summary**

**Inspection Information**

Checklist Reference Number	220826
Date	26 August 2022 (Friday)
Time	14:30 – 15:30

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.: 220819).	

	Name	Signature	Date
Recorded by	Echo Hung		26 August 2022
Checked by	Colman Wong		29 August 2022

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

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


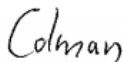
**EP-337/2009 & EP-445/2013/B**

**Weekly Site Inspection Record Summary**

**Inspection Information**

Checklist Reference Number	220831
Date	31 August 2022 (Wednesday)
Time	14:30 – 15:30

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.: 220826).	

	Name	Signature	Date
Recorded by	Echo Hung		31 August 2022
Checked by	Colman Wong		1 September 2022

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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:** August 2022

**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 2022

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects *	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	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	43.77	0	0	0	0.00	0	0	0	0	0	43.77
Feb	58.14	0	0	0	0.00	0	0	0	0	0	58.14
Mar	87.83	0	0	0	0.00	0	0	0	0	0	87.83
Apr	247.25	0	0	0	0.00	0	0	0	0	0	247.25
May	173.63	0	0	0	0.00	0	0	0	0	0	173.63
June	114.17	0	0	0	0.00	0	0	0	0	0	114.17
Sub-total	724.79	0	0	0	0.00	0	0	0	0	0	724.79
July	154.61	0	0	0	154.61	0	0	0	0	0	15.99
Aug	90.67	0	0	0	90.67	0	0	0	0	0	8.45
Sept		0	0	0		0	0	0	0	0	
Oct		0	0	0		0	0	0	0	0	
Nov		0	0	0		0	0	0	0	0	
Dec		0	0	0		0	0	0	0	0	
Total	970.07	0	0	0	245.28	0	0	0	0	0	749.23

\* 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

August 2022

(Version 1.1)

Certified By	 <hr/> (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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FUGRO TECHNICAL SERVICES LIMITED  
Fugro Development Centre  
5 Lok Yi Street, Tai Lam  
Tuen Mun, NT  
Hong Kong

Date 13 September 2022  
Our Ref. MCL/ED/0339/2022/C

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

BY EMAIL

Attn.: 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 August 2022**

We refer to your emails dated 13 September 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 Cyrus Lai on 3565 4442.

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/cl

c.c. CEDD – Attn.: Mr. Ricky Chan  
Attn.: Mr. Vincent Yip  
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## EXECUTIVE SUMMARY

### Introduction

1. This is the 68<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 August 2022.
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 - Cognito 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:

- Install lift inside the lift shaft of LT1 at SKLR Playground
- Carry out finishing works & E&M works inside subway
- Reinstate the road and drain at TTA stage 3 & Stage 4-3 of PERE
- Relocation of material storage yard and workshop

### **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 (WT00041367-2022).
- 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:

- Install lift inside the lift shaft of LT1 at SKLR Playground
- Carry out finishing works & E&M works inside subway
- Reinstatement of the road and drain at TTA stage 3 & Stage 4-3 of PERE
- Relocation of material storage yard and workshop

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	• BSW Atech BSWA 308	3
Calibrator	• SOUNDTEK ST-120	2

**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 <sup>(*)</sup> (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 (August 2022), $\mu\text{g}/\text{m}^3$	
			Average	Range
AM2 – Lee Kau Yan Memorial School	290	312	42.1	23.1 – 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 (August 2022), $\mu\text{g}/\text{m}^3$	
			Average	Range
AM2(A) – Ng Wah Catholic Secondary School	145	169	49.3	12.9 – 120.5

**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 (August 2022), $L_{eq(30min)}$ dB(A)
M3(A) – The Bridge connecting The Latitude	Not predicted in EIA Report	59.7 - 75.1 <sup>(2)</sup>
M4 – Lee Kau Yan Memorial School	47 – 74	73.1 - 76.0 <sup>(1)</sup>
M5(C) – Mercy Grace's Home	Not predicted in EIA Report	73.5 - 79.1 <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 2, 10, 16, 23 & 31 August 2022 in the reporting month. A joint site inspection with the representative of IEC, ER, the Contractor and the ET was conducted on 10 August 2022. 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	Expired
WT00041367-2022	20 Jun 2022	31 Mar 2027	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
<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 T&C at Lift LT4 at Road D1
- Carry out finishing works & E&M works inside subway
- Implement TTA stage 2 & Stage 4-2 of PERE
- Relocation of material storage yard and workshop
- Reinstatement works at SKLR Playground

### **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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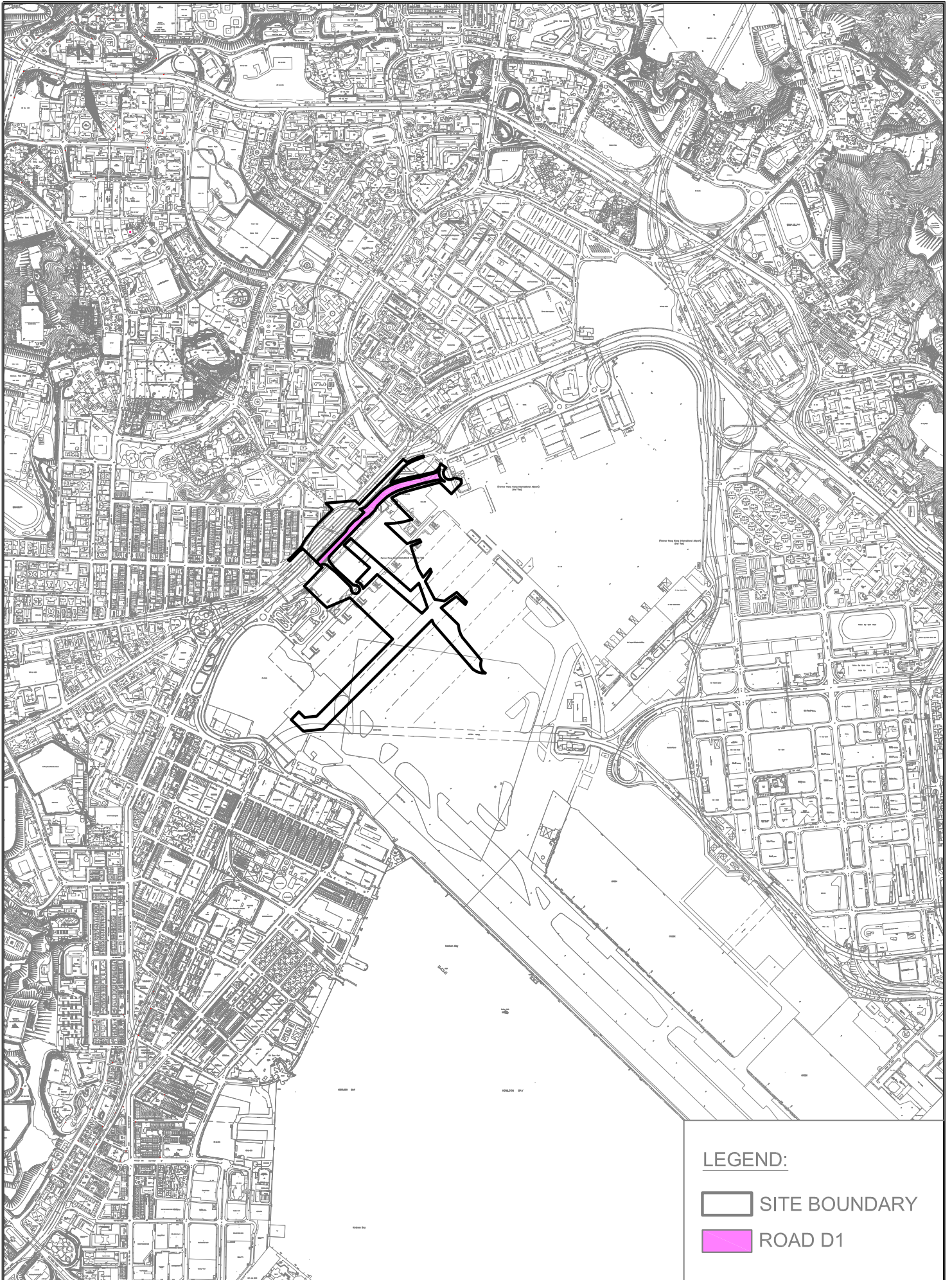
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## FIGURES

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**LEGEND:**

 SITE BOUNDARY

 ROAD D1

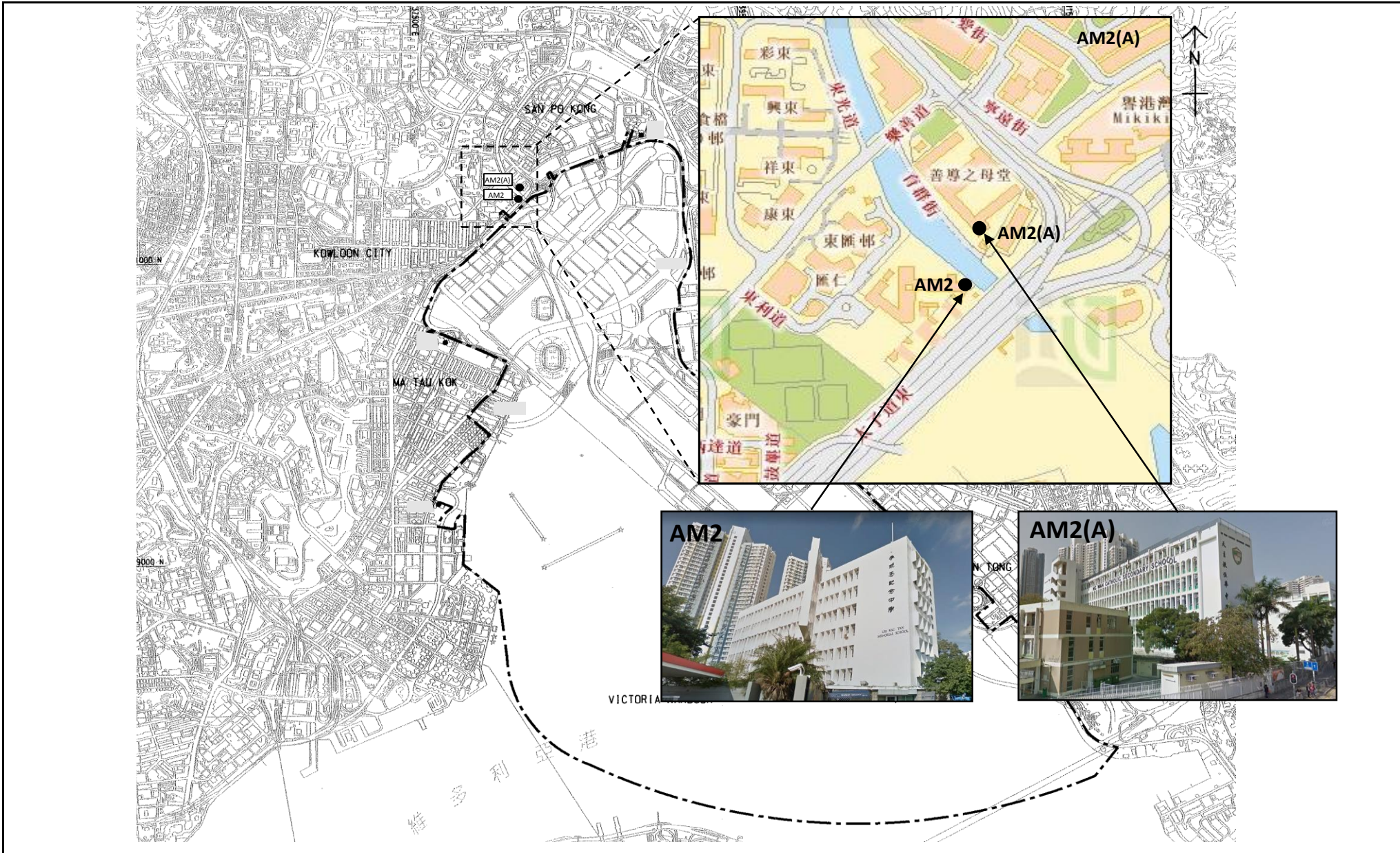


KL/2015/02 KAI TAK - STAGE 5A INFRASTRUCTURE  
AT FORMER NORTH APRON AREA

**SITE LAYOUT PLAN**

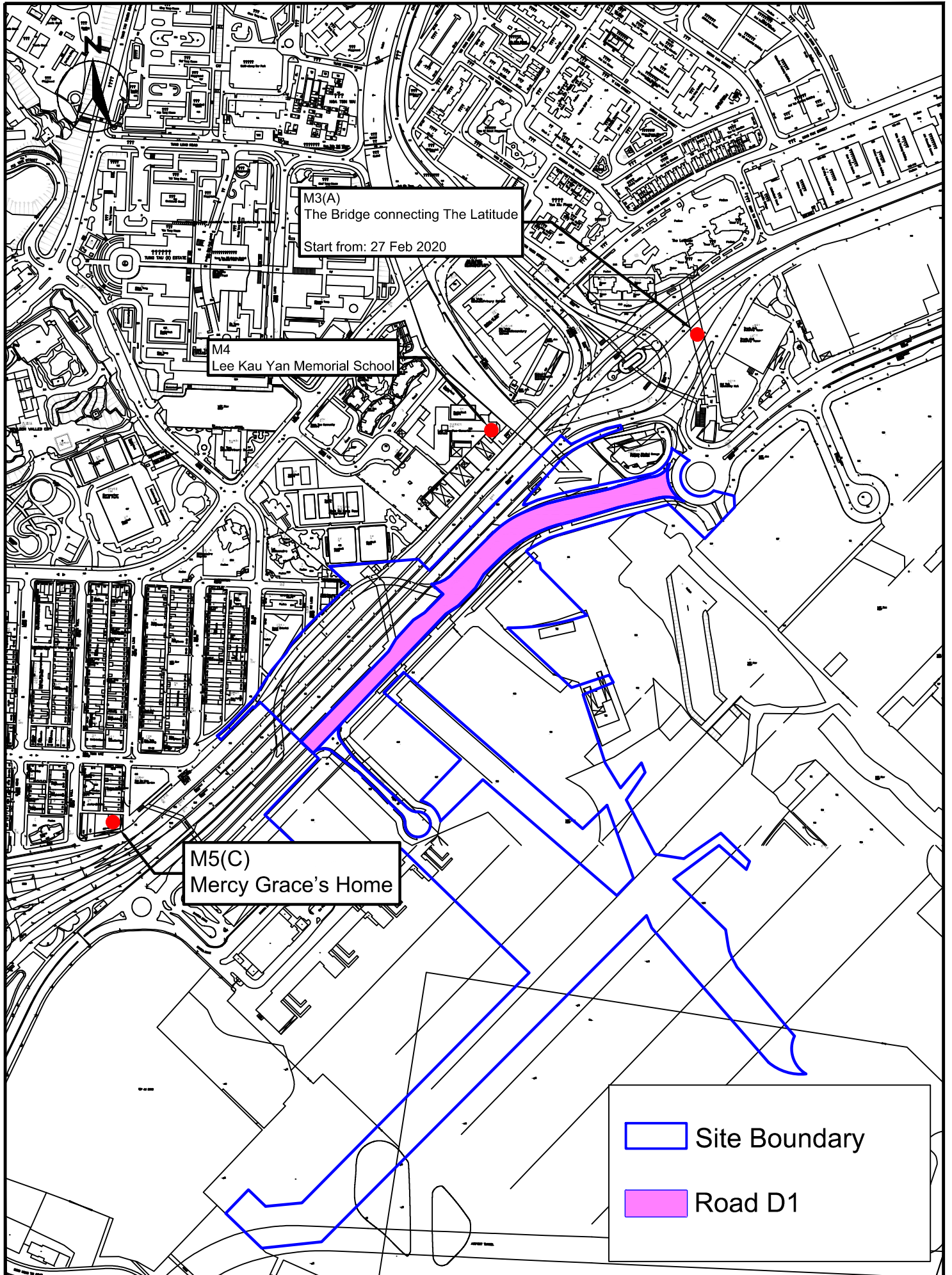
SCALE	1:1500@A4	DATE	DEC 2016
CHECK	KC	DRAWN	JW
JOB No.	MA16043	FIGURE NO.	1
		REV	-





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	



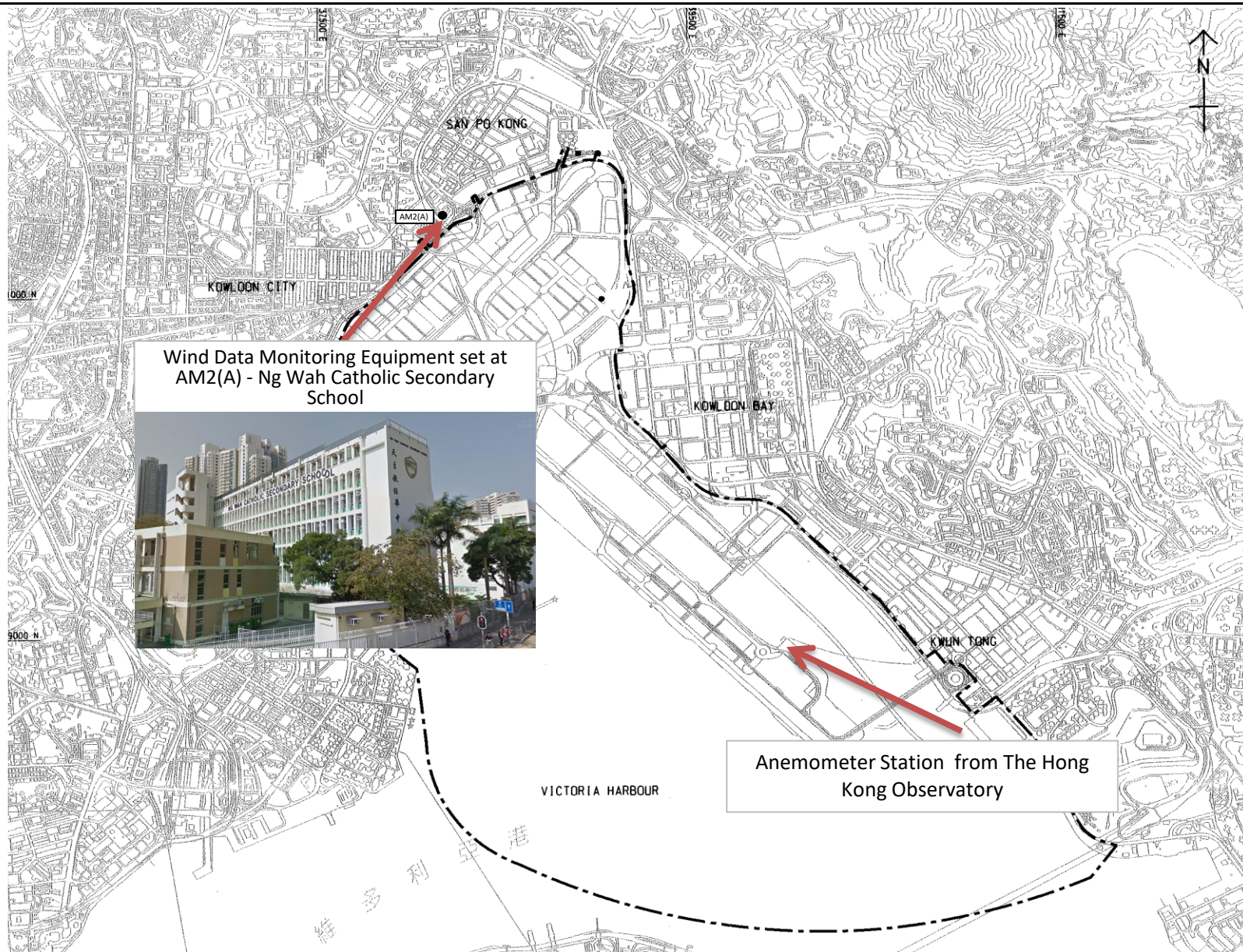


KL/2015/02 KAI TAK - STAGE 5A INFRASTRUCTURE  
AT FORMER NORTH APRON AREA

Location of Noise Monitoring Station

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		Scale	Project No.	MA16043	CINOTECH
	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		Date	Figure	4	
			Aug-17			

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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.

---

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

---

**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 29-Jul-22  
 Manufacturer: Sibata Scientific Technology LTD. Validity of Calibration Record 28-Sep-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

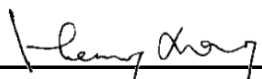
Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration (µg/m <sup>3</sup> ) X-axis	Mass concentration (µg/m <sup>3</sup> ) Y-axis
1	72.0	161.0
2	64.0	145.0
3	51.0	115.0
<b>Average</b>	<b>62.3</b>	<b>140.3</b>
<b>By Linear Regression of Y on X</b> Slope , mw = <u>2.2018</u> Intercept, bw = <u>3.0890</u> Correlation coefficient* = <u>0.9993</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler (µg/m <sup>3</sup> )		140.3
Particulate Concentration by Dust Meter (µg/m <sup>3</sup> )		62.3
Measureing time, (min)		60.0
Set Correlation Factor , SCF		
SCF = [ K=High Volume Sampler / Dust Meter, (µg/m <sup>3</sup> ) ]		<u>2.3</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 Litimed)**

Calibrated by:   
 Technical Officer (Wong Shing Kwai)

Approved by:   
 Project Manager (Henry Leung)





<b>RECALIBRATION DUE DATE:</b>
<b>January 31, 2023</b>

# Certificate of Calibration

Calibration Certification Information			
Cal. Date: January 31, 2022	Rootsmeter S/N: 438320	Ta: 294	°K
Operator: Jim Tisch		Pa: 752.6	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: <b>3864</b>		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4490	3.2	2.00
2	3	4	1	1.0320	6.4	4.00
3	5	6	1	0.9160	7.9	5.00
4	7	8	1	0.8730	8.8	5.50
5	9	10	1	0.7230	12.7	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left( \frac{Ta}{Pa} \right)}$ (y-axis)
0.9995	0.6898	1.4169	0.9957	0.6872	0.8839
0.9952	0.9643	2.0037	0.9915	0.9608	1.2500
0.9932	1.0843	2.2402	0.9895	1.0802	1.3976
0.9920	1.1363	2.3496	0.9883	1.1321	1.4658
0.9868	1.3649	2.8337	0.9831	1.3598	1.7678
<b>QSTD</b>	m=	<b>2.09281</b>	<b>QA</b>	m=	<b>1.31048</b>
	b=	<b>-0.02426</b>		b=	<b>-0.01514</b>
	r=	<b>0.99993</b>		r=	<b>0.99993</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
<b>Key</b>	
ΔH: calibrator manometer reading (in H2O)	
ΔP: rootsmeter manometer reading (mm Hg)	
Ta: actual absolute temperature (°K)	
Pa: actual barometric pressure (mm Hg)	
b: intercept	
m: slope	

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. MA16043/13/0031

Project No. AM2(A) - Ng Wah Catholic Secondary School  
 Date: 5-Jul-22 Next Due Date: 4-Sep-22 Operator: SK  
 Equipment No.: A-01-13 Model No.: TE-5170 Serial No. 1352

Ambient Condition			
Temperature, Ta (K)	<b>302</b>	Pressure, Pa (mmHg)	<b>753.2</b>

Orifice Transfer Standard Information					
Serial No.	3864	Slope, mc	0.05922	Intercept, bc	-0.02420
Last Calibration Date:	31-Jan-22	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	31-Jan-23	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X-axis	DW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	<b>12.8</b>	3.54	60.15	<b>10.7</b>	3.23
2	<b>11.0</b>	3.28	55.79	<b>8.4</b>	2.87
3	<b>8.1</b>	2.81	47.93	<b>5.8</b>	2.38
4	<b>5.5</b>	2.32	39.57	<b>3.2</b>	1.77
5	<b>3.3</b>	1.80	30.74	<b>1.8</b>	1.33

### By Linear Regression of Y on X

Slope, mw = 0.0651 Intercept, bw : -0.7326  
 Correlation coefficient\* = 0.9974

\*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 =  $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$  4.36

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

Conducted by: Wong Shing Kwai Signature:  Date: 5-Jul-22

Checked by: Henry Leung Signature:  Date: 5-Jul-22

## 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-Apr-2022  
 Next Due Date: 8-Oct-2022

### 1. Performance check of Wind Speed

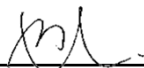
Wind Speed, m/s		Difference D (m/s)
Wind Speed Reading (V1)	Anemometer Value (V1)	$D = V1 - V2$
0.0	0.0	0.0
1.5	1.5	0.0
2.0	2.0	0.0
3.3	3.4	-0.1

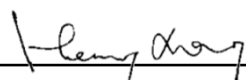
### 2. Performance check of Wind Direction

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

1. Performance check of anemometer

Air Velocity, m/s		Difference D (m/s)
Instrument Reading (V1)	Reference Value (V1)	$D = V1 - V2$
2	2	0

2. Performance check of wind direction sensor

Wind Direction (°)		Difference D (°)
Instrument Reading (W1)	Reference Value (W2)	$D = W1 - W2$
0	0	0
45	45	0
90.2	90	0.2
135.3	135	0.3
180	180	0
225.1	225	0.1
270.3	270	0.3
315	315	0
360	360	0

---

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

---

## 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. : 00152  
Application No. : HP00034

Issue Date : 19 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 Integrating Sound Level Meter.

Equipment No.: : N-12-01

Manufacturer: : BSWA Technology

Other information :

Model No.	BSWA 308
Serial No.	570183
Microphone No.	570605

Date Received : 10 Nov 2021

Test Period : 10 Nov 2021 to 17 Nov 2021

Test Requested : Performance checking for Sound Level Meter

Test Method : The Sound Level 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**

A handwritten signature in black ink, appearing to read 'Lee Wai Kit', is written over a horizontal line.

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. : 00152  
Application No. : HP00034

Issue Date : 19 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

Test Result :

Reference value, dB	Indication value, dB	Deviation, dB	Allowed deviation, dB
94.0	94.1	+0.1	± 1.5
114.0	114.0	0.0	± 1.5

- 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 -

## 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. : 00145  
Application No. : HP00029

Issue Date : 04 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 Integrating Sound Level Meter.

Equipment No.: : N-12-03  
Manufacturer: : BSWA Technology

Other information	Model No.	BSWA 308
	Serial No.	570188
	Microphone No.	570608

Date Received : 26 Oct 2021

Test Period : 26 Oct 2021 to 02 Nov 2021

Test Requested : Performance checking for Sound Level Meter

Test Method : The Sound Level 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**

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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. : 00145  
Application No. : HP00029

Issue Date : 04 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

Test Result :

Reference value, dB	Indication value, dB	Deviation, dB	Allowed deviation, dB
94.0	93.9	-0.1	± 1.5
114.0	114.0	0.0	± 1.5

- 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 -

## 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. : 00149  
Application No. : HP00031

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 Integrating Sound Level Meter.

Equipment No.: : N-12-04

Manufacturer: : BSWA Technology

Other information :

Model No.	BSWA 308
Serial No.	580238
Microphone No.	590073

Date Received : 05 Nov 2021

Test Period : 08 Nov 2021 to 12 Nov 2021

Test Requested : Performance checking for Sound Level Meter

Test Method : The Sound Level 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**

A handwritten signature in black ink, appearing to be 'Lee Wai Kit', written over a horizontal line.

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. : 00149

Issue Date : 16 Nov 2021

Application No. : HP00031

### Certificate of Calibration

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

Test Result :

Reference value, dB	Indication value, dB	Deviation, dB	Allowed deviation, dB
94.0	93.7	-0.3	± 1.5
114.0	114.0	0.0	± 1.5

- 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 -

**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. : 00150  
Application No. : HP00032

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-13-01

Manufacturer: : SOUNDTEK

Other information : Model No.	ST-120
Serial No.	181001608

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. : 00150  
Application No. : HP00032

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	94.1	+0.1	± 0.3
114.0	114.0	0.0	± 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 -

## 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. : 00151  
Application No. : HP00033

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-13-02

Manufacturer: : SOUNDTEK

Other information :

Model No.	ST-120
Serial No.	181001636

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**

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Lee Wai Kit  
Laboratory Manager

## High Precision Chemical Testing Ltd.

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Report No. : 00151  
Application No. : HP00033

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	94.0	0.0	± 0.3
114.0	114.1	+0.1	± 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

August 2022

Date	Mean Pressure (hPa)	Air Temperature	Mean Relative Humidity (%)	Precipitation (mm)
		Mean (°C)		
1-Aug-22	1005.9	31.4	69	0
2-Aug-22	1007.1	31.1	70	0.2
3-Aug-22	1006.7	28.2	82	34.9
4-Aug-22	1004.5	27.1	86	14.9
5-Aug-22	1007.6	26.1	94	165.5
6-Aug-22	1007.6	27.9	89	5.5
7-Aug-22	1006.7	29.6	82	2.8
8-Aug-22	1006.3	28.3	87	33.3
9-Aug-22	1003.6	26.7	88	72
10-Aug-22	1004.1	27.4	90	49.7
11-Aug-22	1007.8	26.7	90	12.4
12-Aug-22	1008.8	26.1	93	76
13-Aug-22	1008.0	28.7	81	0
14-Aug-22	1007.2	29.5	78	0
15-Aug-22	1006.2	30.0	78	0
16-Aug-22	1005.6	29.4	82	9.1
17-Aug-22	1005.8	28.2	86	29.8
18-Aug-22	1005.5	28.1	87	22.1
19-Aug-22	1004.9	28.3	85	4.8
20-Aug-22	1007.5	28.2	83	8.4
21-Aug-22	1008.3	29.0	84	1.9
22-Aug-22	1006.9	30.1	77	0
23-Aug-22	1005.0	31.1	77	0
24-Aug-22	1002.3	30.8	73	5.5
25-Aug-22	1006.3	27.2	85	48.1
26-Aug-22	1010.6	29.4	80	0.1
27-Aug-22	1009.2	29.7	78	0
28-Aug-22	1008.4	30.5	80	0
29-Aug-22	1010.2	30.1	78	0
30-Aug-22	1008.8	29.5	80	13.1
31-Aug-22	1006.7	29.7	80	4.7

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

August 2022			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
1-Aug-22	0:00	1.3	W
1-Aug-22	1:00	1.3	W
1-Aug-22	2:00	0.9	NW
1-Aug-22	3:00	1.3	NW
1-Aug-22	4:00	0.9	NW
1-Aug-22	5:00	0.9	NW
1-Aug-22	6:00	0.4	NNW
1-Aug-22	7:00	1.3	NW
1-Aug-22	8:00	0.9	NW
1-Aug-22	9:00	1.3	NW
1-Aug-22	10:00	0.4	ESE
1-Aug-22	11:00	0.4	ESE
1-Aug-22	12:00	0.4	NNW
1-Aug-22	13:00	0.4	N
1-Aug-22	14:00	0.4	NW
1-Aug-22	15:00	1.3	NW
1-Aug-22	16:00	1.3	NW
1-Aug-22	17:00	1.8	ESE
1-Aug-22	18:00	1.3	NNW
1-Aug-22	19:00	1.3	NW
1-Aug-22	20:00	3.1	WNW
1-Aug-22	21:00	2.2	NW
1-Aug-22	22:00	1.8	ESE
1-Aug-22	23:00	2.2	ESE
2-Aug-22	0:00	2.2	NNW
2-Aug-22	1:00	0.9	N
2-Aug-22	2:00	1.8	NW
2-Aug-22	3:00	1.8	NW
2-Aug-22	4:00	1.3	NW
2-Aug-22	5:00	1.3	ESE
2-Aug-22	6:00	1.3	NNW
2-Aug-22	7:00	1.8	NW
2-Aug-22	8:00	0.4	WNW
2-Aug-22	9:00	0.9	NW
2-Aug-22	10:00	0.9	W
2-Aug-22	11:00	0.9	WNW
2-Aug-22	12:00	1.3	WNW
2-Aug-22	13:00	1.3	W
2-Aug-22	14:00	1.3	NW
2-Aug-22	15:00	1.3	WNW
2-Aug-22	16:00	1.8	WNW
2-Aug-22	17:00	1.3	WNW
2-Aug-22	18:00	1.8	W
2-Aug-22	19:00	1.3	WNW
2-Aug-22	20:00	0.9	WNW
2-Aug-22	21:00	1.3	WNW
2-Aug-22	22:00	1.8	W
2-Aug-22	23:00	1.8	WNW

August 2022			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
3-Aug-22	0:00	1.3	WNW
3-Aug-22	1:00	0.9	W
3-Aug-22	2:00	0.9	WNW
3-Aug-22	3:00	0.9	W
3-Aug-22	4:00	0.9	W
3-Aug-22	5:00	0.4	W
3-Aug-22	6:00	0.9	NW
3-Aug-22	7:00	0.9	NW
3-Aug-22	8:00	0.4	SE
3-Aug-22	9:00	0.9	NW
3-Aug-22	10:00	0.9	W
3-Aug-22	11:00	0.4	W
3-Aug-22	12:00	0.9	W
3-Aug-22	13:00	0.1	ENE
3-Aug-22	14:00	0.4	ENE
3-Aug-22	15:00	0.9	NW
3-Aug-22	16:00	1.3	W
3-Aug-22	17:00	0.9	W
3-Aug-22	18:00	1.3	W
3-Aug-22	19:00	1.3	WNW
3-Aug-22	20:00	0.9	WNW
3-Aug-22	21:00	1.3	W
3-Aug-22	22:00	1.3	WNW
3-Aug-22	23:00	0.9	W
4-Aug-22	0:00	0.9	W
4-Aug-22	1:00	0.9	W
4-Aug-22	2:00	0.9	WNW
4-Aug-22	3:00	0.9	W
4-Aug-22	4:00	0.4	SE
4-Aug-22	5:00	0.4	W
4-Aug-22	6:00	0.9	ESE
4-Aug-22	7:00	0.4	ESE
4-Aug-22	8:00	0.4	W
4-Aug-22	9:00	0.4	W
4-Aug-22	10:00	0.9	E
4-Aug-22	11:00	0.4	WNW
4-Aug-22	12:00	1.3	NW
4-Aug-22	13:00	0.9	W
4-Aug-22	14:00	1.3	W
4-Aug-22	15:00	1.3	W
4-Aug-22	16:00	1.3	NW
4-Aug-22	17:00	0.9	NNW
4-Aug-22	18:00	1.3	NW
4-Aug-22	19:00	0.9	NW
4-Aug-22	20:00	0.9	NW
4-Aug-22	21:00	0.4	NW
4-Aug-22	22:00	1.3	NW
4-Aug-22	23:00	0.9	NW

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

August 2022			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
5-Aug-22	0:00	1.3	NW
5-Aug-22	1:00	0.4	WNW
5-Aug-22	2:00	0.4	NNW
5-Aug-22	3:00	0.4	E
5-Aug-22	4:00	0.4	E
5-Aug-22	5:00	0.4	ENE
5-Aug-22	6:00	0.4	ENE
5-Aug-22	7:00	0.4	E
5-Aug-22	8:00	0.4	WNW
5-Aug-22	9:00	0.9	WNW
5-Aug-22	10:00	0.9	NW
5-Aug-22	11:00	0.9	E
5-Aug-22	12:00	1.3	W
5-Aug-22	13:00	1.3	W
5-Aug-22	14:00	1.8	NW
5-Aug-22	15:00	2.7	NW
5-Aug-22	16:00	3.6	NW
5-Aug-22	17:00	4.5	NW
5-Aug-22	18:00	3.1	NW
5-Aug-22	19:00	1.8	NW
5-Aug-22	20:00	0.9	NW
5-Aug-22	21:00	0.4	W
5-Aug-22	22:00	0.9	NW
5-Aug-22	23:00	1.8	NW
6-Aug-22	0:00	1.8	NW
6-Aug-22	1:00	1.3	NW
6-Aug-22	2:00	0.4	NW
6-Aug-22	3:00	0.4	W
6-Aug-22	4:00	0.4	ESE
6-Aug-22	5:00	0.4	ESE
6-Aug-22	6:00	0.9	NE
6-Aug-22	7:00	0.9	NNW
6-Aug-22	8:00	1.3	NNW
6-Aug-22	9:00	0.9	WNW
6-Aug-22	10:00	0.9	ESE
6-Aug-22	11:00	0.9	SE
6-Aug-22	12:00	0.9	ESE
6-Aug-22	13:00	1.3	ESE
6-Aug-22	14:00	1.8	E
6-Aug-22	15:00	1.3	NW
6-Aug-22	16:00	2.2	NW
6-Aug-22	17:00	4.5	NW
6-Aug-22	18:00	1.3	NW
6-Aug-22	19:00	0.9	WNW
6-Aug-22	20:00	0.4	W
6-Aug-22	21:00	1.3	NW
6-Aug-22	22:00	0.9	NW
6-Aug-22	23:00	0.9	NW

August 2022			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
7-Aug-22	0:00	0.9	W
7-Aug-22	1:00	0.9	NE
7-Aug-22	2:00	1.3	NNW
7-Aug-22	3:00	0.4	NE
7-Aug-22	4:00	0.4	ENE
7-Aug-22	5:00	0.4	E
7-Aug-22	6:00	0.9	E
7-Aug-22	7:00	0.9	W
7-Aug-22	8:00	0.9	WNW
7-Aug-22	9:00	1.3	NW
7-Aug-22	10:00	1.8	WNW
7-Aug-22	11:00	1.3	WNW
7-Aug-22	12:00	1.3	WNW
7-Aug-22	13:00	1.3	W
7-Aug-22	14:00	2.2	NW
7-Aug-22	15:00	4.5	NW
7-Aug-22	16:00	4.9	NW
7-Aug-22	17:00	4.5	NW
7-Aug-22	18:00	4.9	NW
7-Aug-22	19:00	3.6	NW
7-Aug-22	20:00	2.7	NW
7-Aug-22	21:00	2.7	NW
7-Aug-22	22:00	1.8	NW
7-Aug-22	23:00	1.3	NW
8-Aug-22	0:00	1.8	NW
8-Aug-22	1:00	0.9	NW
8-Aug-22	2:00	0.4	SE
8-Aug-22	3:00	1.9	ESE
8-Aug-22	4:00	1.9	SE
8-Aug-22	5:00	0.4	ESE
8-Aug-22	6:00	1.9	ESE
8-Aug-22	7:00	0.4	ESE
8-Aug-22	8:00	0.9	SE
8-Aug-22	9:00	0.9	SE
8-Aug-22	10:00	1.8	ESE
8-Aug-22	11:00	0.9	SE
8-Aug-22	12:00	1.3	SE
8-Aug-22	13:00	1.8	SE
8-Aug-22	14:00	1.3	SE
8-Aug-22	15:00	0.9	SE
8-Aug-22	16:00	2.2	NW
8-Aug-22	17:00	1.3	NW
8-Aug-22	18:00	0.9	SE
8-Aug-22	19:00	2.2	SE
8-Aug-22	20:00	2.2	ESE
8-Aug-22	21:00	2.2	SE
8-Aug-22	22:00	1.8	ESE
8-Aug-22	23:00	1.8	ESE

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

August 2022			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
9-Aug-22	0:00	0.9	SE
9-Aug-22	1:00	0.9	SE
9-Aug-22	2:00	0.9	SE
9-Aug-22	3:00	2.7	ESE
9-Aug-22	4:00	3.1	SE
9-Aug-22	5:00	3.1	ESE
9-Aug-22	6:00	2.7	NW
9-Aug-22	7:00	3.1	ESE
9-Aug-22	8:00	3.1	SE
9-Aug-22	9:00	2.7	ESE
9-Aug-22	10:00	2.2	NNW
9-Aug-22	11:00	1.3	ESE
9-Aug-22	12:00	1.3	NNE
9-Aug-22	13:00	1.3	SE
9-Aug-22	14:00	1.3	NE
9-Aug-22	15:00	1.3	NNE
9-Aug-22	16:00	1.3	SE
9-Aug-22	17:00	2.7	SE
9-Aug-22	18:00	3.1	SE
9-Aug-22	19:00	3.1	SE
9-Aug-22	20:00	2.7	SE
9-Aug-22	21:00	2.2	SE
9-Aug-22	22:00	2.7	SE
9-Aug-22	23:00	1.8	SE
10-Aug-22	0:00	0.9	SE
10-Aug-22	1:00	0.9	SE
10-Aug-22	2:00	1.8	NW
10-Aug-22	3:00	1.3	NNW
10-Aug-22	4:00	2.2	SE
10-Aug-22	5:00	2.7	ESE
10-Aug-22	6:00	2.2	SE
10-Aug-22	7:00	0.9	SE
10-Aug-22	8:00	0.9	NNE
10-Aug-22	9:00	0.9	NNE
10-Aug-22	10:00	0.9	N
10-Aug-22	11:00	1.8	SE
10-Aug-22	12:00	1.3	SE
10-Aug-22	13:00	2.2	SE
10-Aug-22	14:00	1.3	NNE
10-Aug-22	15:00	1.3	SE
10-Aug-22	16:00	1.3	ESE
10-Aug-22	17:00	1.3	NNE
10-Aug-22	18:00	1.3	NW
10-Aug-22	19:00	1.3	N
10-Aug-22	20:00	1.3	NW
10-Aug-22	21:00	1.3	NNE
10-Aug-22	22:00	1.3	NNW
10-Aug-22	23:00	0.9	NNW

August 2022			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
11-Aug-22	0:00	1.3	N
11-Aug-22	1:00	0.9	N
11-Aug-22	2:00	1.3	N
11-Aug-22	3:00	1.8	NNE
11-Aug-22	4:00	1.8	NW
11-Aug-22	5:00	1.8	NNW
11-Aug-22	6:00	1.8	NNE
11-Aug-22	7:00	1.3	NNW
11-Aug-22	8:00	0.9	ESE
11-Aug-22	9:00	0.9	SE
11-Aug-22	10:00	0.9	ESE
11-Aug-22	11:00	1.3	NNE
11-Aug-22	12:00	1.3	N
11-Aug-22	13:00	1.3	SE
11-Aug-22	14:00	1.3	N
11-Aug-22	15:00	1.3	SE
11-Aug-22	16:00	1.3	NNW
11-Aug-22	17:00	1.3	ESE
11-Aug-22	18:00	1.3	SE
11-Aug-22	19:00	0.9	ESE
11-Aug-22	20:00	0.9	SE
11-Aug-22	21:00	1.3	ESE
11-Aug-22	22:00	1.3	NNW
11-Aug-22	23:00	0.9	NNW
12-Aug-22	0:00	0.9	NNW
12-Aug-22	1:00	0.9	N
12-Aug-22	2:00	0.9	NNW
12-Aug-22	3:00	0.9	SE
12-Aug-22	4:00	0.9	N
12-Aug-22	5:00	0.9	N
12-Aug-22	6:00	0.9	NE
12-Aug-22	7:00	0.9	NNE
12-Aug-22	8:00	0.9	N
12-Aug-22	9:00	0.9	SE
12-Aug-22	10:00	1.3	SE
12-Aug-22	11:00	2.2	SE
12-Aug-22	12:00	2.7	SE
12-Aug-22	13:00	3.1	SE
12-Aug-22	14:00	3.1	SE
12-Aug-22	15:00	3.1	SE
12-Aug-22	16:00	2.7	SE
12-Aug-22	17:00	1.3	E
12-Aug-22	18:00	1.3	SE
12-Aug-22	19:00	0.9	SE
12-Aug-22	20:00	1.3	SE
12-Aug-22	21:00	0.9	ESE
12-Aug-22	22:00	0.9	ESE
12-Aug-22	23:00	0.9	N

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

August 2022			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
13-Aug-22	0:00	1.3	N
13-Aug-22	1:00	1.3	NNW
13-Aug-22	2:00	0.9	N
13-Aug-22	3:00	0.9	N
13-Aug-22	4:00	0.9	NW
13-Aug-22	5:00	0.9	NNW
13-Aug-22	6:00	0.4	SE
13-Aug-22	7:00	0.4	SE
13-Aug-22	8:00	1.3	SE
13-Aug-22	9:00	1.3	SE
13-Aug-22	10:00	1.8	SE
13-Aug-22	11:00	1.8	ESE
13-Aug-22	12:00	1.3	NNE
13-Aug-22	13:00	2.2	SE
13-Aug-22	14:00	1.3	SE
13-Aug-22	15:00	1.3	NNE
13-Aug-22	16:00	1.3	ESE
13-Aug-22	17:00	1.3	ESE
13-Aug-22	18:00	1.3	NW
13-Aug-22	19:00	1.3	NNW
13-Aug-22	20:00	1.3	N
13-Aug-22	21:00	0.9	NNE
13-Aug-22	22:00	1.3	NW
13-Aug-22	23:00	0.9	SE
14-Aug-22	0:00	1.3	NNW
14-Aug-22	1:00	0.9	N
14-Aug-22	2:00	0.9	NNE
14-Aug-22	3:00	0.9	SE
14-Aug-22	4:00	0.4	N
14-Aug-22	5:00	1.8	NW
14-Aug-22	6:00	0.1	W
14-Aug-22	7:00	0.1	W
14-Aug-22	8:00	0.4	SE
14-Aug-22	9:00	0.9	SE
14-Aug-22	10:00	0.9	SE
14-Aug-22	11:00	1.3	SE
14-Aug-22	12:00	1.3	SE
14-Aug-22	13:00	1.8	SE
14-Aug-22	14:00	1.8	SE
14-Aug-22	15:00	2.2	SE
14-Aug-22	16:00	1.8	SE
14-Aug-22	17:00	1.3	ESE
14-Aug-22	18:00	1.3	SE
14-Aug-22	19:00	0.9	ESE
14-Aug-22	20:00	0.9	SE
14-Aug-22	21:00	0.9	NW
14-Aug-22	22:00	0.9	N
14-Aug-22	23:00	0.9	SE

August 2022			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
15-Aug-22	0:00	1.3	N
15-Aug-22	1:00	0.9	NNE
15-Aug-22	2:00	0.9	ESE
15-Aug-22	3:00	0.9	N
15-Aug-22	4:00	0.9	N
15-Aug-22	5:00	0.9	NW
15-Aug-22	6:00	0.4	NW
15-Aug-22	7:00	0.4	NW
15-Aug-22	8:00	0.9	ESE
15-Aug-22	9:00	1.8	SE
15-Aug-22	10:00	1.3	SE
15-Aug-22	11:00	1.8	SE
15-Aug-22	12:00	2.2	SE
15-Aug-22	13:00	1.8	SE
15-Aug-22	14:00	1.8	SE
15-Aug-22	15:00	1.3	NNE
15-Aug-22	16:00	1.8	N
15-Aug-22	17:00	1.8	N
15-Aug-22	18:00	1.3	E
15-Aug-22	19:00	1.3	ESE
15-Aug-22	20:00	1.3	SE
15-Aug-22	21:00	1.3	SE
15-Aug-22	22:00	1.3	ESE
15-Aug-22	23:00	0.4	SE
16-Aug-22	0:00	0.9	N
16-Aug-22	1:00	1.3	SE
16-Aug-22	2:00	0.9	SE
16-Aug-22	3:00	0.9	SE
16-Aug-22	4:00	1.3	SE
16-Aug-22	5:00	1.3	SE
16-Aug-22	6:00	0.9	SE
16-Aug-22	7:00	0.4	ESE
16-Aug-22	8:00	1.3	SE
16-Aug-22	9:00	1.3	N
16-Aug-22	10:00	1.3	SE
16-Aug-22	11:00	1.3	N
16-Aug-22	12:00	1.3	SE
16-Aug-22	13:00	0.9	SE
16-Aug-22	14:00	0.9	SE
16-Aug-22	15:00	1.3	NW
16-Aug-22	16:00	0.9	NNE
16-Aug-22	17:00	0.9	SE
16-Aug-22	18:00	0.4	ESE
16-Aug-22	19:00	0.9	NNE
16-Aug-22	20:00	0.9	N
16-Aug-22	21:00	0.9	NNW
16-Aug-22	22:00	1.3	NW
16-Aug-22	23:00	0.4	NW

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

August 2022			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
17-Aug-22	0:00	0.4	NW
17-Aug-22	1:00	0.1	NW
17-Aug-22	2:00	0.1	NNW
17-Aug-22	3:00	0.4	NW
17-Aug-22	4:00	0.9	NW
17-Aug-22	5:00	0.9	NW
17-Aug-22	6:00	0.4	ESE
17-Aug-22	7:00	0.9	ESE
17-Aug-22	8:00	0.9	NNW
17-Aug-22	9:00	1.3	N
17-Aug-22	10:00	0.9	NW
17-Aug-22	11:00	1.8	NW
17-Aug-22	12:00	0.4	NW
17-Aug-22	13:00	0.4	ESE
17-Aug-22	14:00	0.4	NNW
17-Aug-22	15:00	1.8	NW
17-Aug-22	16:00	1.8	WNW
17-Aug-22	17:00	0.9	NW
17-Aug-22	18:00	0.9	SE
17-Aug-22	19:00	0.9	NW
17-Aug-22	20:00	0.9	NW
17-Aug-22	21:00	1.3	NNW
17-Aug-22	22:00	0.9	NW
17-Aug-22	23:00	1.3	SE
18-Aug-22	0:00	1.3	SE
18-Aug-22	1:00	0.9	NW
18-Aug-22	2:00	0.4	NW
18-Aug-22	3:00	0.9	NW
18-Aug-22	4:00	0.9	NW
18-Aug-22	5:00	0.9	NNW
18-Aug-22	6:00	0.9	NW
18-Aug-22	7:00	1.3	NW
18-Aug-22	8:00	1.3	NW
18-Aug-22	9:00	0.9	ESE
18-Aug-22	10:00	1.8	ESE
18-Aug-22	11:00	1.3	NNW
18-Aug-22	12:00	1.8	N
18-Aug-22	13:00	1.3	NW
18-Aug-22	14:00	1.3	NW
18-Aug-22	15:00	1.8	NW
18-Aug-22	16:00	1.3	ESE
18-Aug-22	17:00	0.4	NNW
18-Aug-22	18:00	0.1	NW
18-Aug-22	19:00	0.4	WNW
18-Aug-22	20:00	0.9	NW
18-Aug-22	21:00	0.9	SE
18-Aug-22	22:00	0.4	SE
18-Aug-22	23:00	0.9	SE

August 2022			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
19-Aug-22	0:00	0.4	SE
19-Aug-22	1:00	0.1	SE
19-Aug-22	2:00	0.1	SE
19-Aug-22	3:00	0.1	NW
19-Aug-22	4:00	0.4	NW
19-Aug-22	5:00	0.1	NW
19-Aug-22	6:00	0.4	NW
19-Aug-22	7:00	0.1	NNW
19-Aug-22	8:00	0.4	NW
19-Aug-22	9:00	0.9	NW
19-Aug-22	10:00	0.9	NW
19-Aug-22	11:00	1.3	ESE
19-Aug-22	12:00	1.3	ESE
19-Aug-22	13:00	2.2	NNW
19-Aug-22	14:00	1.8	N
19-Aug-22	15:00	2.7	NW
19-Aug-22	16:00	2.2	NW
19-Aug-22	17:00	2.7	NW
19-Aug-22	18:00	3.1	ESE
19-Aug-22	19:00	1.8	NNW
19-Aug-22	20:00	1.3	NW
19-Aug-22	21:00	0.4	WNW
19-Aug-22	22:00	1.3	NW
19-Aug-22	23:00	0.9	NW
20-Aug-22	0:00	0.9	NW
20-Aug-22	1:00	0.4	NW
20-Aug-22	2:00	0.9	NW
20-Aug-22	3:00	0.4	NE
20-Aug-22	4:00	0.4	N
20-Aug-22	5:00	0.4	N
20-Aug-22	6:00	0.1	N
20-Aug-22	7:00	0.4	NW
20-Aug-22	8:00	0.9	NNW
20-Aug-22	9:00	1.3	WNW
20-Aug-22	10:00	0.9	W
20-Aug-22	11:00	0.9	WNW
20-Aug-22	12:00	1.3	WNW
20-Aug-22	13:00	0.9	NW
20-Aug-22	14:00	1.8	NW
20-Aug-22	15:00	1.3	NW
20-Aug-22	16:00	1.8	NW
20-Aug-22	17:00	1.3	NNW
20-Aug-22	18:00	1.3	NW
20-Aug-22	19:00	0.9	NW
20-Aug-22	20:00	0.9	NW
20-Aug-22	21:00	0.4	ESE
20-Aug-22	22:00	1.3	ESE
20-Aug-22	23:00	0.9	NNW

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

August 2022			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
21-Aug-22	0:00	1.3	N
21-Aug-22	1:00	0.9	NW
21-Aug-22	2:00	0.4	NW
21-Aug-22	3:00	0.4	NW
21-Aug-22	4:00	2.2	ESE
21-Aug-22	5:00	1.3	NNW
21-Aug-22	6:00	0.4	NW
21-Aug-22	7:00	0.9	WNW
21-Aug-22	8:00	0.4	NW
21-Aug-22	9:00	0.4	WNW
21-Aug-22	10:00	0.9	W
21-Aug-22	11:00	0.9	W
21-Aug-22	12:00	1.3	NNW
21-Aug-22	13:00	1.3	W
21-Aug-22	14:00	0.9	W
21-Aug-22	15:00	4.0	NW
21-Aug-22	16:00	5.4	NW
21-Aug-22	17:00	4.9	NW
21-Aug-22	18:00	5.4	NW
21-Aug-22	19:00	2.7	NNW
21-Aug-22	20:00	0.9	WNW
21-Aug-22	21:00	1.8	NW
21-Aug-22	22:00	1.8	NW
21-Aug-22	23:00	1.8	NW
22-Aug-22	0:00	1.3	NW
22-Aug-22	1:00	0.9	NW
22-Aug-22	2:00	1.3	NW
22-Aug-22	3:00	0.4	NNW
22-Aug-22	4:00	0.9	WNW
22-Aug-22	5:00	0.4	NW
22-Aug-22	6:00	0.4	NW
22-Aug-22	7:00	0.1	NW
22-Aug-22	8:00	1.3	NW
22-Aug-22	9:00	1.3	NW
22-Aug-22	10:00	0.9	W
22-Aug-22	11:00	1.8	NW
22-Aug-22	12:00	1.8	NW
22-Aug-22	13:00	3.1	NW
22-Aug-22	14:00	3.1	NW
22-Aug-22	15:00	2.7	NW
22-Aug-22	16:00	3.1	NW
22-Aug-22	17:00	2.7	NW
22-Aug-22	18:00	3.1	NW
22-Aug-22	19:00	3.1	NNW
22-Aug-22	20:00	2.7	NW
22-Aug-22	21:00	1.3	NW
22-Aug-22	22:00	0.4	NW
22-Aug-22	23:00	0.9	ESE

August 2022			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
23-Aug-22	0:00	0.4	ESE
23-Aug-22	1:00	0.9	NNW
23-Aug-22	2:00	0.1	N
23-Aug-22	3:00	1.3	NW
23-Aug-22	4:00	1.3	NW
23-Aug-22	5:00	0.4	NW
23-Aug-22	6:00	0.4	ESE
23-Aug-22	7:00	0.9	NNW
23-Aug-22	8:00	0.9	NW
23-Aug-22	9:00	0.4	WNW
23-Aug-22	10:00	0.9	NW
23-Aug-22	11:00	1.3	E
23-Aug-22	12:00	0.9	ESE
23-Aug-22	13:00	1.3	SE
23-Aug-22	14:00	2.2	NW
23-Aug-22	15:00	2.7	NW
23-Aug-22	16:00	3.1	NW
23-Aug-22	17:00	4.0	NW
23-Aug-22	18:00	2.7	NW
23-Aug-22	19:00	1.8	NNW
23-Aug-22	20:00	0.9	NW
23-Aug-22	21:00	2.2	NW
23-Aug-22	22:00	2.7	NW
23-Aug-22	23:00	3.1	NW
24-Aug-22	0:00	4.0	NW
24-Aug-22	1:00	2.7	ESE
24-Aug-22	2:00	1.8	SE
24-Aug-22	3:00	4.0	SE
24-Aug-22	4:00	2.7	SE
24-Aug-22	5:00	1.8	SE
24-Aug-22	6:00	0.9	SE
24-Aug-22	7:00	2.2	SE
24-Aug-22	8:00	2.7	SE
24-Aug-22	9:00	3.1	E
24-Aug-22	10:00	1.8	SE
24-Aug-22	11:00	0.9	SE
24-Aug-22	12:00	1.8	SE
24-Aug-22	13:00	2.2	SE
24-Aug-22	14:00	1.3	SE
24-Aug-22	15:00	1.3	SE
24-Aug-22	16:00	1.8	SE
24-Aug-22	17:00	1.3	SE
24-Aug-22	18:00	1.3	SE
24-Aug-22	19:00	1.8	SE
24-Aug-22	20:00	1.3	SE
24-Aug-22	21:00	2.2	ESE
24-Aug-22	22:00	1.8	ESE
24-Aug-22	23:00	2.7	SE

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

August 2022			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
25-Aug-22	0:00	2.7	E
25-Aug-22	1:00	2.7	N
25-Aug-22	2:00	1.8	ESE
25-Aug-22	3:00	1.8	SSE
25-Aug-22	4:00	2.2	SSE
25-Aug-22	5:00	1.8	SE
25-Aug-22	6:00	2.2	SE
25-Aug-22	7:00	2.2	SE
25-Aug-22	8:00	2.7	ESE
25-Aug-22	9:00	2.7	SE
25-Aug-22	10:00	2.7	SE
25-Aug-22	11:00	1.8	SE
25-Aug-22	12:00	1.8	SE
25-Aug-22	13:00	2.2	SE
25-Aug-22	14:00	1.8	SE
25-Aug-22	15:00	2.2	SE
25-Aug-22	16:00	2.2	SE
25-Aug-22	17:00	0.4	SE
25-Aug-22	18:00	0.4	SSE
25-Aug-22	19:00	0.4	SE
25-Aug-22	20:00	0.9	WNW
25-Aug-22	21:00	1.8	SE
25-Aug-22	22:00	0.9	SE
25-Aug-22	23:00	0.9	ESE
26-Aug-22	0:00	0.4	SE
26-Aug-22	1:00	0.9	SE
26-Aug-22	2:00	0.1	SSE
26-Aug-22	3:00	0.1	NNW
26-Aug-22	4:00	0.4	NNW
26-Aug-22	5:00	1.8	NNW
26-Aug-22	6:00	0.9	NNW
26-Aug-22	7:00	1.8	NNW
26-Aug-22	8:00	0.9	NNW
26-Aug-22	9:00	0.9	NNW
26-Aug-22	10:00	0.9	ESE
26-Aug-22	11:00	0.9	W
26-Aug-22	12:00	0.9	SE
26-Aug-22	13:00	0.4	NW
26-Aug-22	14:00	0.4	SSE
26-Aug-22	15:00	0.4	SE
26-Aug-22	16:00	0.4	NNW
26-Aug-22	17:00	0.4	NNW
26-Aug-22	18:00	0.4	NNW
26-Aug-22	19:00	0.4	NW
26-Aug-22	20:00	0.4	NW
26-Aug-22	21:00	0.4	NW
26-Aug-22	22:00	0.1	NW
26-Aug-22	23:00	0.1	NW

August 2022			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
27-Aug-22	0:00	0.1	NW
27-Aug-22	1:00	0.1	NW
27-Aug-22	2:00	0.4	E
27-Aug-22	3:00	0.9	ESE
27-Aug-22	4:00	0.4	ESE
27-Aug-22	5:00	0.9	ESE
27-Aug-22	6:00	0.9	E
27-Aug-22	7:00	1.8	E
27-Aug-22	8:00	1.8	ESE
27-Aug-22	9:00	1.3	ESE
27-Aug-22	10:00	0.9	E
27-Aug-22	11:00	0.9	ESE
27-Aug-22	12:00	1.8	NNW
27-Aug-22	13:00	3.1	NNW
27-Aug-22	14:00	1.3	NNW
27-Aug-22	15:00	1.8	NNW
27-Aug-22	16:00	1.3	NNW
27-Aug-22	17:00	1.3	WNW
27-Aug-22	18:00	2.2	WNW
27-Aug-22	19:00	0.9	W
27-Aug-22	20:00	2.7	WNW
27-Aug-22	21:00	2.2	WNW
27-Aug-22	22:00	2.7	WNW
27-Aug-22	23:00	2.7	W
28-Aug-22	0:00	2.7	WNW
28-Aug-22	1:00	2.7	W
28-Aug-22	2:00	1.8	WNW
28-Aug-22	3:00	1.8	WNW
28-Aug-22	4:00	2.2	WNW
28-Aug-22	5:00	1.8	WNW
28-Aug-22	6:00	2.2	WNW
28-Aug-22	7:00	2.2	WNW
28-Aug-22	8:00	2.2	WNW
28-Aug-22	9:00	1.8	WNW
28-Aug-22	10:00	1.8	WNW
28-Aug-22	11:00	1.8	NNW
28-Aug-22	12:00	0.9	WNW
28-Aug-22	13:00	1.3	WNW
28-Aug-22	14:00	0.9	WNW
28-Aug-22	15:00	0.9	W
28-Aug-22	16:00	0.9	WNW
28-Aug-22	17:00	0.9	W
28-Aug-22	18:00	0.9	WNW
28-Aug-22	19:00	1.8	NW
28-Aug-22	20:00	1.3	NW
28-Aug-22	21:00	0.4	W
28-Aug-22	22:00	0.9	NW
28-Aug-22	23:00	0.4	WNW



APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

August 2022			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
29-Aug-22	0:00	0.4	NW
29-Aug-22	1:00	0.4	NW
29-Aug-22	2:00	0.9	WNW
29-Aug-22	3:00	1.8	NNW
29-Aug-22	4:00	0.9	NNW
29-Aug-22	5:00	0.9	NW
29-Aug-22	6:00	1.8	NW
29-Aug-22	7:00	0.9	SE
29-Aug-22	8:00	0.4	SE
29-Aug-22	9:00	0.9	NW
29-Aug-22	10:00	0.9	NW
29-Aug-22	11:00	1.8	NW
29-Aug-22	12:00	2.2	NW
29-Aug-22	13:00	2.2	NW
29-Aug-22	14:00	2.7	NNW
29-Aug-22	15:00	1.3	NW
29-Aug-22	16:00	2.2	NNW
29-Aug-22	17:00	1.3	NNW
29-Aug-22	18:00	0.9	NW
29-Aug-22	19:00	0.4	W
29-Aug-22	20:00	0.9	NNW
29-Aug-22	21:00	0.4	NW
29-Aug-22	22:00	0.9	W
29-Aug-22	23:00	2.2	NNW
30-Aug-22	0:00	1.3	NW
30-Aug-22	1:00	0.4	SE
30-Aug-22	2:00	0.4	ENE
30-Aug-22	3:00	0.4	NE
30-Aug-22	4:00	0.4	E
30-Aug-22	5:00	1.3	NNW
30-Aug-22	6:00	0.9	NNW
30-Aug-22	7:00	1.3	NNW
30-Aug-22	8:00	1.3	W
30-Aug-22	9:00	0.9	W
30-Aug-22	10:00	0.9	WNW
30-Aug-22	11:00	1.8	WNW
30-Aug-22	12:00	1.3	NW
30-Aug-22	13:00	0.9	NW
30-Aug-22	14:00	1.3	WNW
30-Aug-22	15:00	1.3	WNW
30-Aug-22	16:00	1.3	WNW
30-Aug-22	17:00	1.8	W
30-Aug-22	18:00	1.3	WNW
30-Aug-22	19:00	1.3	WNW
30-Aug-22	20:00	1.3	W
30-Aug-22	21:00	1.3	W
30-Aug-22	22:00	1.3	WNW
30-Aug-22	23:00	0.9	W

August 2022			
Table II: Wind Speed and Directions			
Date	Time	Wind Speed m/s	Direction
31-Aug-22	0:00	0.9	ESE
31-Aug-22	1:00	0.9	ESE
31-Aug-22	2:00	1.3	W
31-Aug-22	3:00	1.3	E
31-Aug-22	4:00	0.9	ESE
31-Aug-22	5:00	1.3	ESE
31-Aug-22	6:00	1.3	E
31-Aug-22	7:00	1.3	E
31-Aug-22	8:00	1.3	E
31-Aug-22	9:00	1.8	E
31-Aug-22	10:00	2.7	W
31-Aug-22	11:00	2.7	WNW
31-Aug-22	12:00	2.7	WNW
31-Aug-22	13:00	2.7	W
31-Aug-22	14:00	2.2	W
31-Aug-22	15:00	2.2	W
31-Aug-22	16:00	2.7	WNW
31-Aug-22	17:00	2.2	W
31-Aug-22	18:00	2.7	WNW
31-Aug-22	19:00	2.2	W
31-Aug-22	20:00	0.4	SW
31-Aug-22	21:00	0.4	SSW
31-Aug-22	22:00	0.4	SSW
31-Aug-22	23:00	0.9	SW

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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 August 2022**

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

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 September 2022**

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

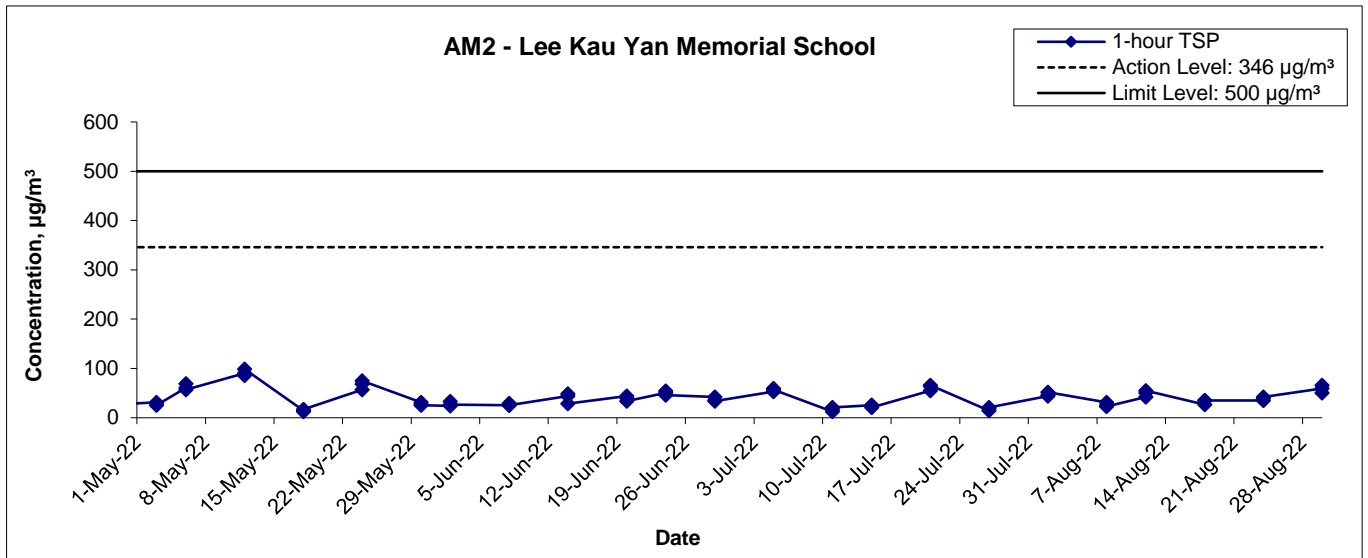
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## Appendix E - 1-hour TSP Monitoring Results

Location AM2 - Lee Kau Yan Memorial School			
Date	Time	Weather	Particulate Concentration ( $\mu\text{g}/\text{m}^3$ )
2-Aug-22	14:00	Fine	44.0
2-Aug-22	15:00	Fine	46.0
2-Aug-22	16:00	Fine	52.0
8-Aug-22	13:00	Cloudy	31.5
8-Aug-22	14:00	Cloudy	25.2
8-Aug-22	15:00	Cloudy	23.1
12-Aug-22	16:00	Rainy	41.8
12-Aug-22	17:00	Rainy	50.6
12-Aug-22	18:00	Rainy	55.0
18-Aug-22	9:00	Fine	26.4
18-Aug-22	10:00	Fine	35.2
18-Aug-22	11:00	Fine	35.2
24-Aug-22	14:00	Sunny	35.2
24-Aug-22	15:00	Sunny	39.6
24-Aug-22	16:00	Sunny	41.8
30-Aug-22	13:00	Cloudy	59.4
30-Aug-22	14:00	Cloudy	50.6
30-Aug-22	15:00	Cloudy	66.0
		Average	42.1
		Maximum	66.0
		Minimum	23.1

### 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 Aug 22	Appendix E	

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

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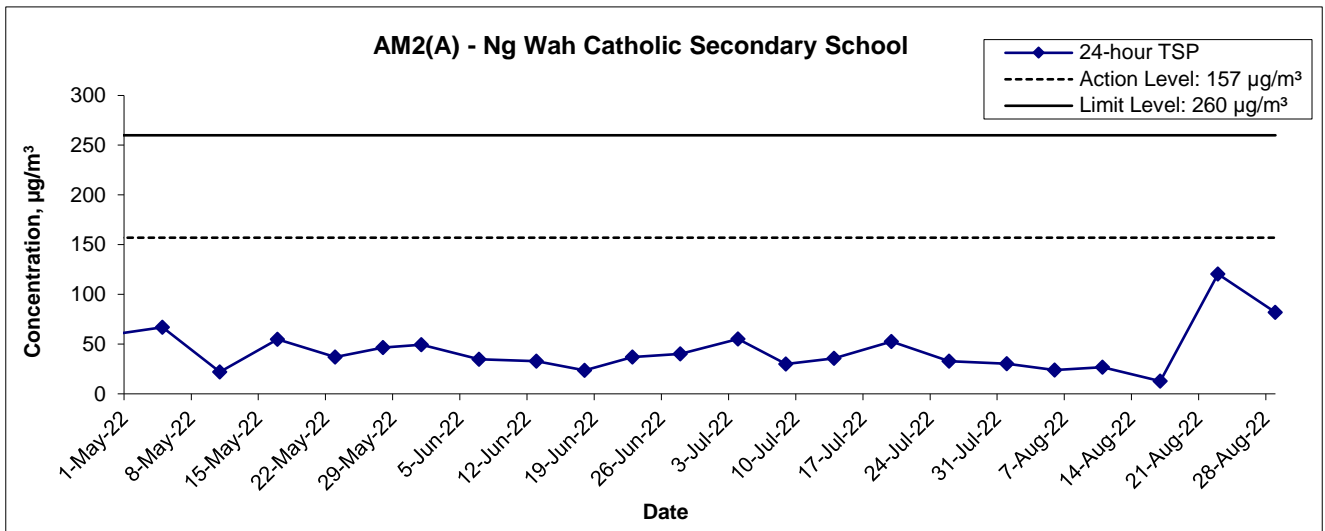


## Appendix F - 24-hour TSP Monitoring Results

### 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 (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
				Initial	Final		Initial	Final		Initial	Final			
1-Aug-22	Sunny	304.3	755.9	3.3098	3.3628	0.0530	9514.8	9538.8	24.0	1.21	1.21	1.21	1748.7	30.3
6-Aug-22	Cloudy	301.8	756.4	3.3102	3.3502	0.0401	9538.8	9561.8	23.0	1.22	1.22	1.22	1681.3	23.8
11-Aug-22	Rainy	299.4	757.2	3.4062	3.4533	0.0471	9561.8	9585.8	24.0	1.22	1.22	1.22	1760.3	26.8
17-Aug-22	Fine	301.2	755.2	3.3684	3.3910	0.0225	9585.8	9609.8	24.0	1.22	1.22	1.22	1754.8	12.9
23-Aug-22	Sunny	304.0	753.7	3.2994	3.5099	0.2104	9609.8	9633.8	24.0	1.21	1.21	1.21	1746.8	120.5
29-Aug-22	Cloudy	302.8	758.1	3.3384	3.4819	0.1435	9633.8	9657.8	24.0	1.22	1.22	1.22	1753.7	81.8
													Min	12.9
													Max	120.5
													Average	49.3

## 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 Aug 22	Appendix F	

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

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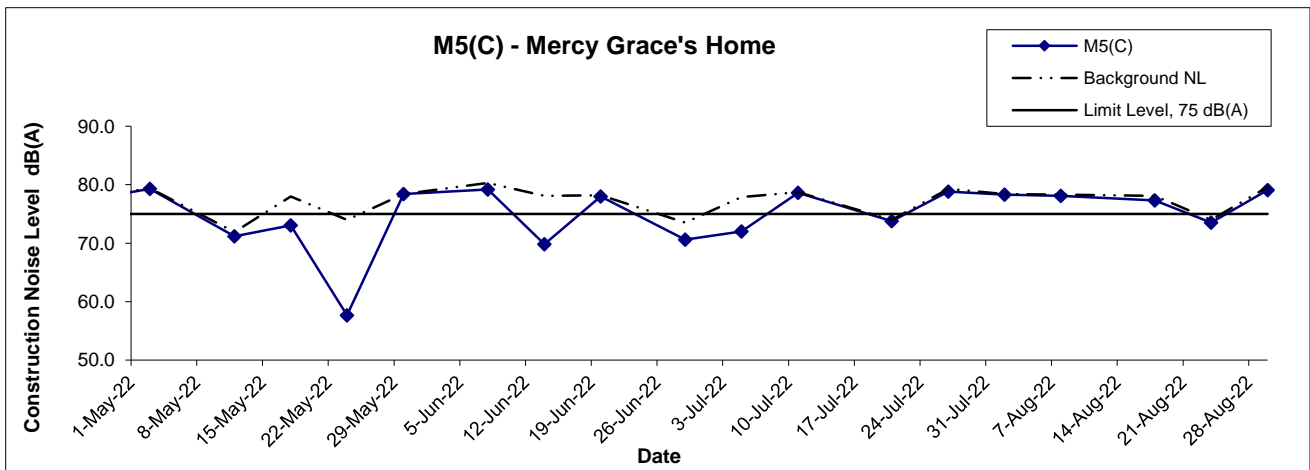
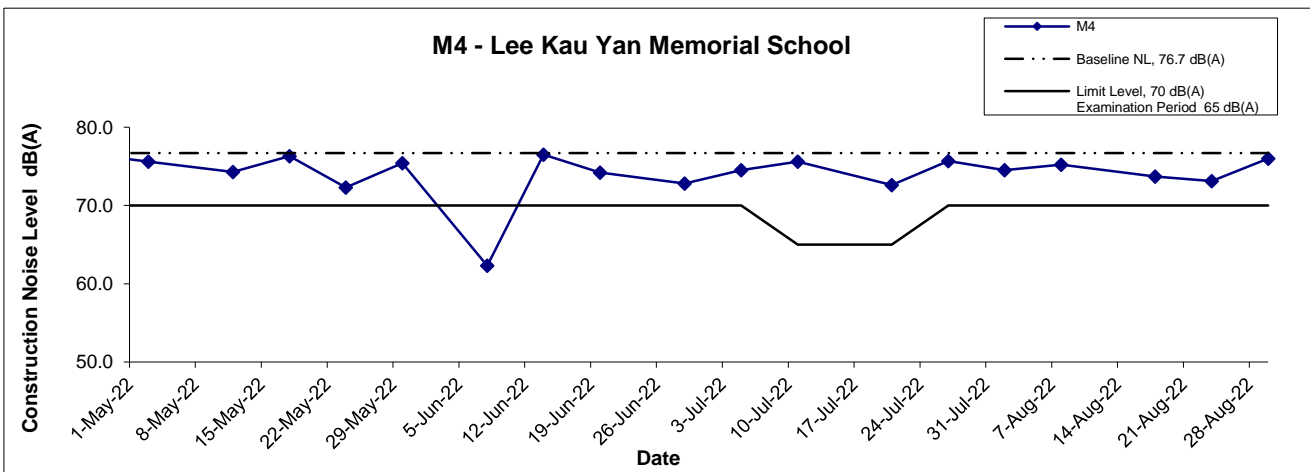
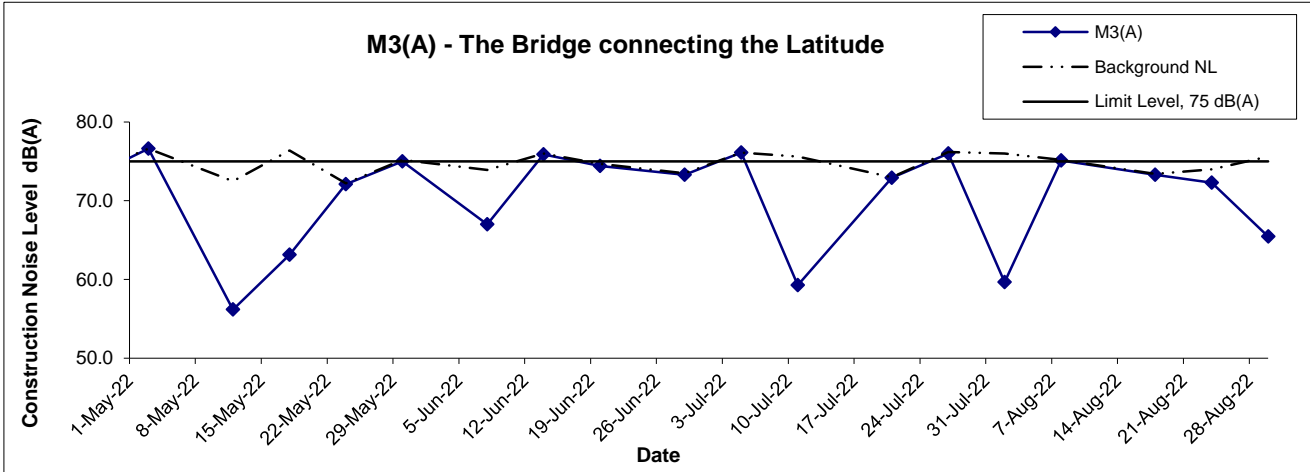
## Appendix G - Noise Monitoring Results

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-Aug-22	11:30	Sunny	76.1	79.7	67.7	76.0	59.7	
8-Aug-22	15:40	Sunny	75.1	76.7	72.2	75.2	75.1	Measured ≤ Background
18-Aug-22	13:00	Sunny	73.3	75.3	70.9	73.4	73.3	Measured ≤ Background
24-Aug-22	11:30	Sunny	72.3	75.9	69.1	74.0	72.3	Measured ≤ Background
30-Aug-22	11:15	Cloudy	76.0	78.0	73.0	75.6	65.4	

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-Aug-22	15:00	Sunny	74.5	75.8	72.8	76.7	74.5	Measured ≤ Baseline
8-Aug-22	14:09	Sunny	75.2	76.6	73.1		75.2	Measured ≤ Baseline
18-Aug-22	9:00	Sunny	73.7	74.9	71.8		73.7	Measured ≤ Baseline
24-Aug-22	14:00	Sunny	73.1	76.2	70.0		73.1	Measured ≤ Baseline
30-Aug-22	13:25	Cloudy	76.0	77.4	74.2		76.0	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-Aug-22	13:00	Sunny	78.3	80.7	74.4	78.4	78.3	Measured ≤ Background
8-Aug-22	11:30	Sunny	78.1	80.5	74.4	78.3	78.1	Measured ≤ Background
18-Aug-22	11:30	Sunny	77.3	79.7	73.4	78.1	77.3	Measured ≤ Background
24-Aug-22	17:21	Sunny	73.5	76.2	70.3	74.0	73.5	Measured ≤ Background
30-Aug-22	14:14	Cloudy	79.1	81.4	75.0	79.6	79.1	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	CINOTECH
	Date	Aug 2022	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:** August 2022

**(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**


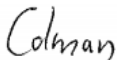
**Environmental Monitoring Works for Contract No. KL/2015/02**

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

**Weekly Site Inspection Record Summary  
Inspection Information**

Checklist Reference Number	220802
Date	2 August 2022 (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.: 220726).	

	Name	Signature	Date
Recorded by	Echo Hung		2 August 2022
Checked by	Colman Wong		3 August 2022

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


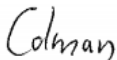
**Environmental Monitoring Works for Contract No. KL/2015/02**

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

**Weekly Site Inspection Record Summary  
Inspection Information**

Checklist Reference Number	220810
Date	10 August 2022 (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.: 220802).	

	Name	Signature	Date
Recorded by	Echo Hung		10 August 2022
Checked by	Colman Wong		11 August 2022

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


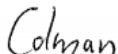
**Environmental Monitoring Works for Contract No. KL/2015/02**

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

**Weekly Site Inspection Record Summary  
Inspection Information**

Checklist Reference Number	220816
Date	16 August 2022 (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.: 220810).	

	Name	Signature	Date
Recorded by	Echo Hung		16 August 2022
Checked by	Colman Wong		17 August 2022

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


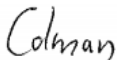
**Environmental Monitoring Works for Contract No. KL/2015/02**

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

**Weekly Site Inspection Record Summary  
Inspection Information**

Checklist Reference Number	220823
Date	23 August 2022 (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.: 220816).	

	Name	Signature	Date
Recorded by	Echo Hung		23 August 2022
Checked by	Colman Wong		24 August 2022

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


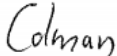
**Environmental Monitoring Works for Contract No. KL/2015/02**

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

**Weekly Site Inspection Record Summary  
Inspection Information**

Checklist Reference Number	220831
Date	31 August 2022 (Wednesday)
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.: 220823).	

	Name	Signature	Date
Recorded by	Echo Hung		31 August 2022
Checked by	Colman Wong		1 September 2022

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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

	<p>EPD, IEC and ER informed of the results.</p>	<p>4. Advise the ER on the effectiveness of the proposed remedial measures.</p>	<p>implemented; 4. Supervise implementation of remedial measures; 5. Conduct meeting with ET and IEC if exceedance continues.</p>	<p>working days of notification; 4. Implement the agreed proposals.</p>
<p>Limit Level being exceeded by two or more consecutive sampling</p>	<p>1. Notify IEC, ER, Contractor and EPD; 2. Repeat measurement to confirm findings; 3. Carry out analysis of Contractor's working procedures to identify source and investigate the causes of exceedance; 4. Increase monitoring frequency to daily; 5. Arrange meeting with IEC, ER and Contractor to discuss the remedial actions to be taken; 6. Assess effectiveness of Contractor's remedial actions and keep EPD, IEC and ER informed of the results; 7. If exceedance stops, cease additional monitoring.</p>	<p>1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.</p>	<p>1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise implementation of remedial measures; 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated.</p>	<p>1. Take immediate action to avoid further exceedance; 2. Discuss with ET, ER and IEC on proper remedial actions; 3. Submit proposals for remedial actions to IEC within three working days of notification; 4. Implement the agreed proposals; 5. Submit further remedial actions if problem still not under control; 6. Stop the relevant portion of works as instructed by the ER until the exceedance is abated.</p>



## 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

	<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 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 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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**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



Peakco - Wo Hing Joint Venture

**Monthly Summary Waste Flow Table for 2022**

As at 1 Sep 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	0.014
Feb	0	0	0	0	0	0	0	0	0	0	0
Mar	0	0	0	0	0	0	0	0	0	0	0
Apr	0	0	0	0	0	0	0	0	0	0	0.007
May	0	0	0	0	0	0	0	0	0	0	0.007
June	0	0	0	0	0	0	0	0	0	0	0.007
Sub-total	68.229	0	0	0.406	68.229	0	0	0	0	0	2.751
July	0	0	0	0	0	0	0	0	0	0	0.014
Aug	0	0	0	0	0	0	0	0	0	0	0.007
Sept											
Oct											
Nov											
Dec											
Total	68.229	0	0	0.406	68.229	0	0	0	0	0	2.772

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				2023													
			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
Subways Construction	Dec-16	Mar-23	[Blue bar spanning from Dec-16 to Mar-23]																																									
Road Works (D1 and L7)	Feb-19	Mar-22	[Blue bar spanning from Feb-19 to Mar-22]																																									
Landscape	Mar-21	Sep-22	[Blue bar spanning from Mar-21 to Sep-22]																																									



# 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**

August 2022

(Version 1.1)

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



(Environmental Team Leader)

Ref.: CEDKTDS4EM00\_0\_0247L.22

14 September 2022

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

By Post and Email

Attention: Mr. Clive Cheng

Dear Sir,

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

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

Reference is made to the Environmental Team's submission of the Monthly EM&A Report for August 2022 (Version 1.1) certified by the ET Leader and provided to us via email on 14 September 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/B.

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 32<sup>nd</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 August 2022.

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

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

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

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

### **Complaint log**

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

*Table II Summary of complaints in the Reporting Month*

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



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

**Notifications of summons and successful prosecutions**

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

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

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

**Report changes**

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

### **Key construction works in the reporting month**

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

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

### **Future key issues**

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

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

Future key issues in the coming month	Potential impact
North Approach Ramp – Construction of end wall	Noise and Air Quality, Chemical and Waste Management
Bridge D3 – Construction of Bridge	Noise and Air Quality, Landscape and Visual
North Depressed Road – Construction of walls & top slab	Noise and Air Quality, Chemical and Waste Management
Underpass – Construction of upstand wall	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 – reinstatement of the seawall and backfilling works	Noise, Air and Water Quality

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

# 1. INTRODUCTION

## Project Background

- 1.1 The Kai Tak Development (KTD) is located in the south-eastern part of Kowloon Peninsula of the HKSAR, comprising the apron and runway areas of the former Kai Tak Airport and existing waterfront areas at To Kwa Wan, Ma Tau Kok, Kowloon Bay, Kwun Tong and Cha Kwo Ling.
- 1.2 Contract No. ED/2018/01 - Kai Tak Development – stage 4 infrastructure at the former runway and south apron (The Project), comprises mainly the design and construction of a dual two-lane Road D3 (Metro Park Section), a single 2-lane Road L12d, a salt water pumping station, a sewage pumping station, landscaped deck and promenade above and adjoining Road D3 (Metro Park Section) respectively, some remaining road works at Road L14, noise barrier at Road D3A, and other associated works at the former runway and south apron. The proposed works are shown in Figure 1 and Figure 2. During the course of the Contract No. ED/2018/01, there may be modification of noise barriers in association with the construction of footbridges connecting to the landscaped deck of Road D3A by developers of adjacent lands (Figure 3). The proposed works and site boundary are shown in Figure 4.
- 1.3 Civil Engineering and Development Department (CEDD) had completed an Environmental Impact Assessment (EIA) and is the Permit Holder.
- 1.4 The construction work under ED/2018/01 comprises the EM&A Manuals (EIA Register Nos. AEIAR-130/2009 for Kai Tak Development and EIA Register Nos. AEIAR-170/2013 for Roads D3A and D4A) and Environmental Permit (EP) Nos. EP-337/2009 and Variation to the EP (VEP) No. EP-445/2013/B.
- 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 end wall	Bridge D3 – Construction of Bridge Deck and abutments
North Depressed Road – Construction of walls & top slab	Underpass – Construction of upstand wall
South Approach Ramp – Construction of Permanent Structure	District Cooling System seawater intake box culvert - reinstatement of the seawall and backfilling works
Rising Main and Water Pipe – Laying of sewage	Lift 3 – Modification works
Lift 4 – Construction of lift shaft	South Depressed Road – construction of permanent works
Landscaped Deck – Construction of pile caps and installation of columns, construction of Landscaped Deck	Transformer Room – Construction of permanent structure
Shing Kai Road – Modification works, laying of storm water drainage	Lift 1 & 2 – Installation of ELS system
CLP substation – Construction of wall & intermediate slab, permeant structure	Noise Barrier – Remaining works, Bus lay-by construction
Seawater Intake Box Culvert of Saltwater Pumping Station – Installation of sheetpiles and ELS system	

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

1.9 The status of required submission under Environmental Permit (EP) conditions under EP-337/2009 and Variation to the EP (VEP) No. EP-445/2013/B 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/B	Submission	Submission Date
Condition 1.11	Condition 1.12	Notification of Commencement Date of Construction of the Project	6 Jan 2020
Condition 2.3	Condition 2.3	Management Organization of Main Construction Companies	9 Sep 2019
Condition 2.3	Condition 2.3	Updated Management Organization of Main Construction Companies	17 Aug 2021
Condition 2.4	Condition 2.4	Design Drawings	6 Jan 2020
Condition 2.11	Condition 2.5	Landscape Mitigation Plans	13 Nov 2020

EP Condition EP-337/2009	EP Condition EP-445/2013/B	Submission	Submission Date
Condition 2.1	Condition 2.5	Landscape Mitigation Plans (Revision 2)	18 May 2021
Condition 3.2	NA	Baseline Monitoring Report	2 Jan 2020
Condition 3.2	NA	Revised Baseline Monitoring Report	28 Mar 2020
Condition 3.3	Condition 3.2	Monthly EM&A Report (July 2022)	12 Aug 2022

## 2. AIR QUALITY MONITORING

### Monitoring Requirements

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

### Monitoring Locations

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

*Table 2.1 Locations of Air Quality Monitoring Stations*

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

### Monitoring Parameters, Frequency and Duration

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



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

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

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

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

### **Monitoring Equipment**

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

*Table 2.3 Air Quality Monitoring Equipment*

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

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

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

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

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

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

2.9 Setup criteria of HVS are shown as follows:

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

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

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

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

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

#### Maintenance/Calibration

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

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

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

#### Measurement Procedures

- 2.19 The measurement procedures of the 1-hour TSP were conducted in accordance with the Manufacturer's Instruction Manual as follows:
- Set up the dust meter on a tripod at 1.2m level.
  - Turned on the dust meter and check the battery, if too low, change new ones. Pointed the meter to the source area or the planned measurement area.

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

### Maintenance/Calibration

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

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

### Wind Data Monitoring

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

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

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

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

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

### Action and Limit Levels

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

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

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

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

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

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

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

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

Air Monitoring Station	Average TSP Concentration, $\mu\text{g}/\text{m}^3$	Range, $\mu\text{g}/\text{m}^3$	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
AM3	39	20 – 58	182	260
AM4(A)	47	33 – 69	187	260
AM7	41	28 – 73	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	38	30 – 55	297	500
AM4(A)	43	35 – 59	326	500
AM7	36	22 – 66	315	500

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

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

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

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

### 3. NOISE MONITORING

#### Monitoring Requirements

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

#### Monitoring Locations

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

*Table 3.1 Locations of Noise Monitoring Stations*

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

#### Monitoring Parameters, Frequency and Duration

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

*Table 3.2 Noise Monitoring Parameters, Frequency and Duration*

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

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

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

### **Monitoring Equipment**

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

*Table 3.3 Noise Monitoring Equipment*

Equipment	Model	Quantity
Sound Level Meter	RION NL52	3
Sound Level Calibrator	RION NC 74	1
Sound Level Calibrator	RION NC 75	1
Air Flowmeter	TSI TA440 Air Velocity	2

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

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

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

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



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

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

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

3.14 Noise level was recorded.

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

### **Maintenance and Calibration**

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

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

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

### **Action and Limit Levels**

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

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

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

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

### **Impact Noise Monitoring results**

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

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

Noise Monitoring Station	Measured $L_{Aeq, 30-min}$ , Average, dB(A)	Measured $L_{Aeq, 30-min}$ , Range, dB(A)	Action Level	Limit Level <sup>^</sup>
M11	68.1	61.1 – 69.6	When one documented complaint is received	75 dB(A)
M12	65.4	59.9 – 68.3		

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

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

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

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

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

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

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

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

Air Monitoring Station	ASR No. in EIA report	Predicted Cumulative Maximum 24-hour average TSP concentration		Measured 24-hr average TSP in Reporting Month (August 2022) $\mu\text{g}/\text{m}^3$
		Scenario 1 (Mid 2009 to Mid 2013), $\mu\text{g}/\text{m}^3$	Scenario 2 (Mid 2013 to Late 2016), $\mu\text{g}/\text{m}^3$	
AM3 - Sky Tower	A40 <sup>^</sup>	106	138	20 – 58
AM4(A) - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop	A43 <sup>^</sup>	123	195	33 – 69
AM7 – Hong Kong Children's Hospital	PA60	NA	NA	28 – 73

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 (August 2022) $\mu\text{g}/\text{m}^3$
		Scenario 1 (Mid 2009 to Mid 2013), $\mu\text{g}/\text{m}^3$	Scenario 2 (Mid 2013 to Late 2016), $\mu\text{g}/\text{m}^3$	
AM3 - Sky Tower	A40	217 <sup>^</sup>	247 <sup>^</sup>	30 – 55
AM4(A) - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop*	A43	283 <sup>^</sup>	409 <sup>^</sup>	35 – 59
AM7 – Hong Kong Children's Hospital	PA60	NA	NA	22 – 66

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 (August 2022) L <sub>Aeq, 30min</sub> , dB(A)
M11 - The Hong Kong Society for the Blind's Factory cum Sheltered Workshop	N18	50 – 76*	61.1 – 69.6
M12 - Hong Kong Children's Hospital	PN83, PN84, PN84A	NA	59.9 – 68.3

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 4, 12, 18 and 25 August 2022 in the reporting month.

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

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

Inspection Date	Key Observations	Recommendations / Actions	Close-out Date / Status
04 August 2022	No	NA	NA
12 August 2022	No	NA	NA
18 August 2022	No	NA	NA
25 August 2022	No	NA	NA

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

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

## 6. ENVIRONMENTAL SITE INSPECTION AND AUDIT





### Site Inspection

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

6.2 Site inspections were conducted on 4, 12, 18 and 25 August 2022 in the reporting month.

6.3 The summaries of site audits are attached in Table 6.1.

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

Inspection Date	Key Observations	Recommendations / Actions	Close-out Date / Status
04 August 2022	N/A	N/A	N/A
12 August 2022	N/A	N/A	N/A
18 August 2022	N/A	N/A	N/A
25 August 2022	 <p>Observation: All temporary and permanent drainage pipes and culverts should be regularly inspected and maintained to ensure proper and efficient operation.</p>	 <p>Action Taken: All temporary and permanent drainage pipes and culverts were maintained properly to ensure proper and efficient operation.</p>	Closed-out on 01 September 2022
	 <p>Observation: Drip tray should be provided for the diesel drum to prevent soil</p>	 <p>Action Taken: The diesel container was removed.</p>	Closed-out on 01 September 2022

Inspection Date	Key Observations	Recommendations / Actions	Close-out Date / Status
	contamination in D3 Bridge.		

### **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/B	3 May 2022	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-RE0206-22	20 Mar 2022	19 Sep 2022
	GW-RE0309-22	14 Apr 2022	13 Oct 2022
	GW-RE0503-22	02 Jun 2022	01 Dec 2022
	GW-RE0539-22	11 Jun 2022	09 Dec 2022
	GW-RE0580-22	18 Jun 2022	16 Dec 2022

**Implementation Status of Environmental Mitigation Measures**

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

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

**Environmental Complaint and Non-compliance**

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

*Table 6.3 Summary of complaints in the Reporting Month*

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

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

**Notifications of summons and successful prosecutions**

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



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

Date of receiving notification of summons or prosecutions	Date of event	Description of event	Action take	Close-out date / Status
No notification of summons and successful prosecutions were received in the reporting 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 end wall	Noise and Air Quality, Chemical and Waste Management
Bridge D3 – Construction of Bridge Deck	Noise and Air Quality, Landscape and Visual
North Depressed Road – Construction of walls & top slab	Noise and Air Quality, Chemical and Waste Management
Underpass – Construction of upstand wall	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 – reinstatement of the seawall and backfilling works	Noise, Air and Water Quality
Lift 3 – Modification works	Noise and Air Quality, Chemical and Waste Management
Lift 4 – Construction of linking platform, Installation of glass	Noise and Air Quality, Chemical and Waste Management
South Depressed Road – construction of permanent works	Noise and Air Quality, Chemical and Waste Management
Rising Main and Water Pipe – Laying of sewage	Noise, Air and Water Quality
Landscaped Deck – Construction of pile caps and installation of columns	Noise, Air and Water Quality
Transformer Room – Construction of permanent structure	Noise, Air and Water Quality
Shing Kai Road – Modification works, laying of storm water drainage pipes	Noise, Air and Water Quality
Lift 1 & 2 – Installation of ELS system	Noise and Air Quality, Chemical and Waste Management
CLP substation – Construction of wall & intermediate slab, permeant structure	Noise, Air and Water Quality
Noise Barrier – Remaining works, Bus lay-by construction	Noise, Air and Water Quality
Seawater Intake Box Culvert of Saltwater Pumping Station – Installation of sheetpiles and ELS system	Noise, Air and Water Quality

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

- Sufficient watering of the works site with the active dust emitting activities,

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

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

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

## **8. CONCLUSIONS**

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

**Figure**

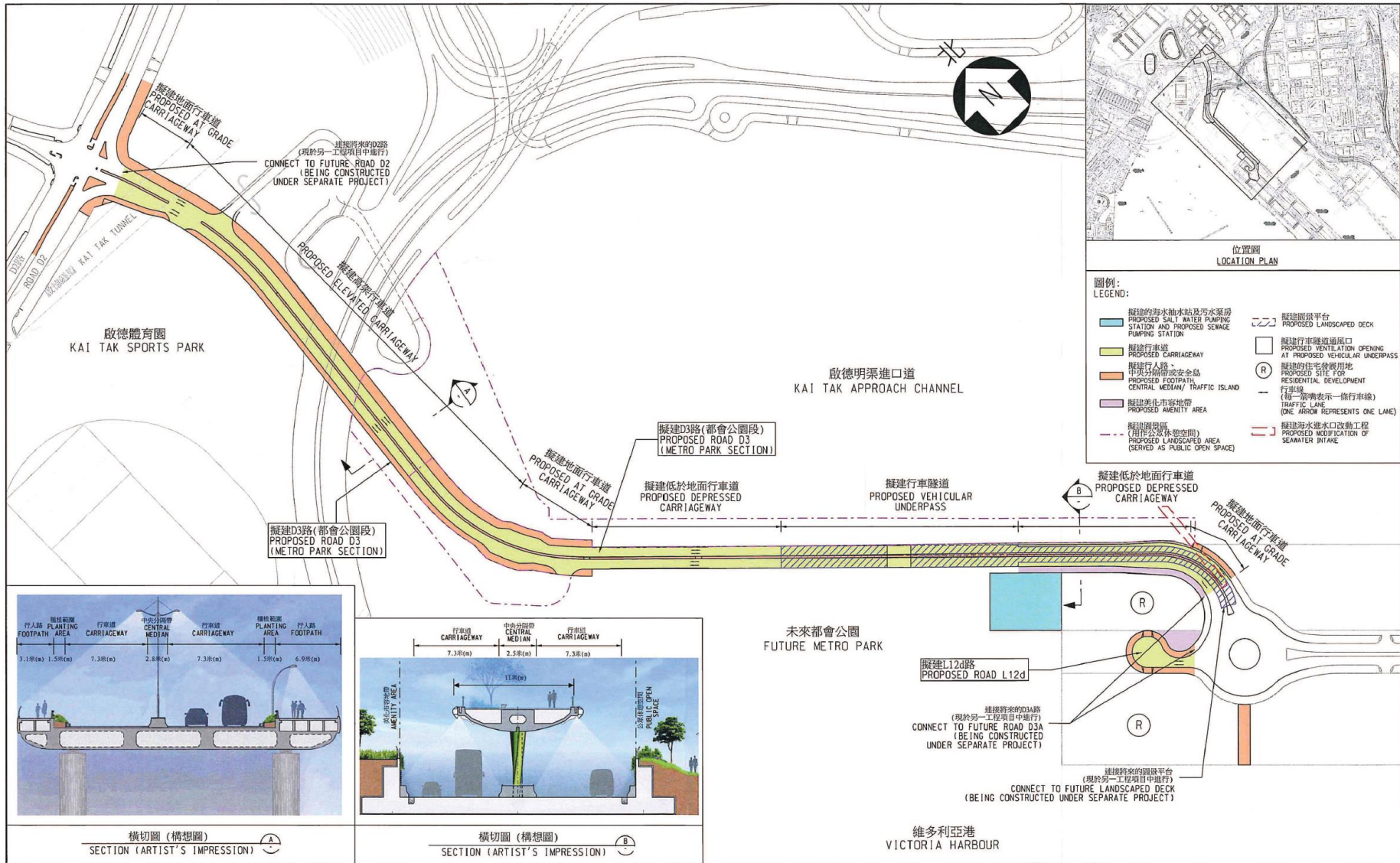


Figure 1 – Proposed works of Contract No. ED/2018/01

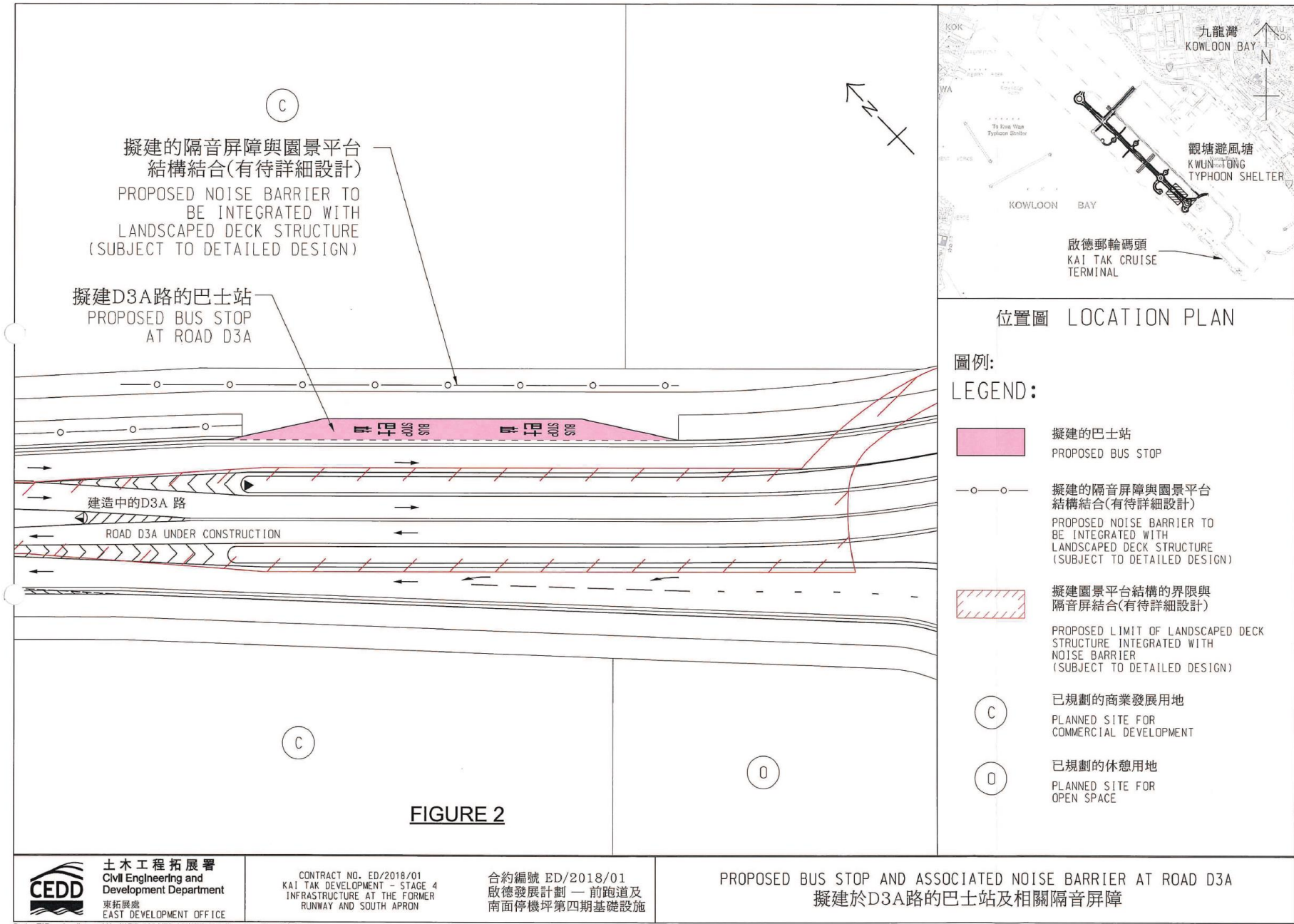
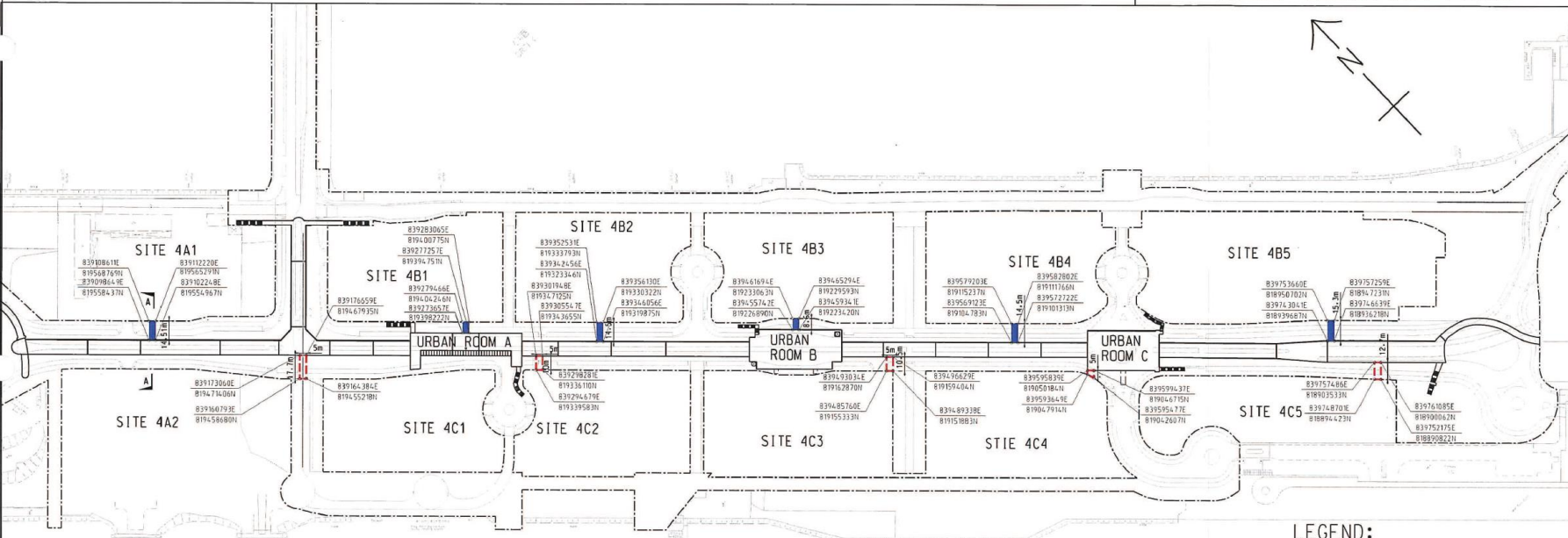
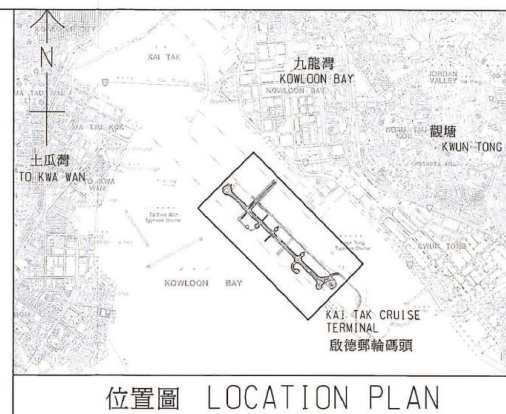
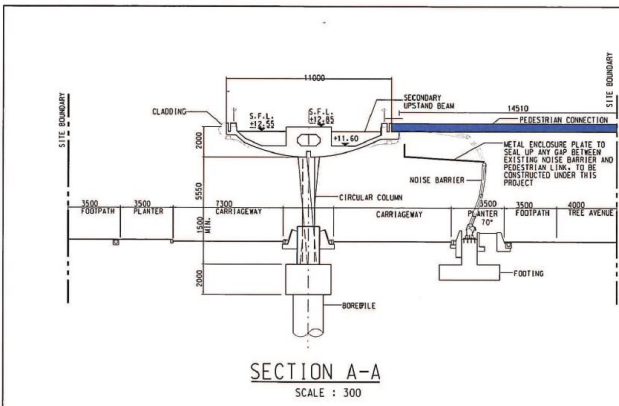


Figure 2 – Proposed Bus Stop And Associated Noise Barrier At Road D3A





- LEGEND:**
- SITE BOUNDARY
  - FUTURE LANDSCAPED PEDESTRIAN CONNECTION
  - FUTURE LANDSCAPED PEDESTRIAN CONNECTION (FOR INFORMATION ONLY)
  - LANDSCAPED DECK

**CEDD** 土木工程拓展署  
Civil Engineering and  
Development Department  
東拓展處  
EAST DEVELOPMENT OFFICE

**FUTURE PEDESTRIAN CONNECTION BETWEEN LANDSCAPED DECK AND PRIVATE DEVELOPMENTS**

SCALE	1 : 3000 (A3)	DATE	3 MAR 2018
DRAWN BY	JY	CHECKED BY	AL
		APPROVED BY	CC
<b>FIGURE 3</b>			REV -

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

Print Date : 7/3/2019

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



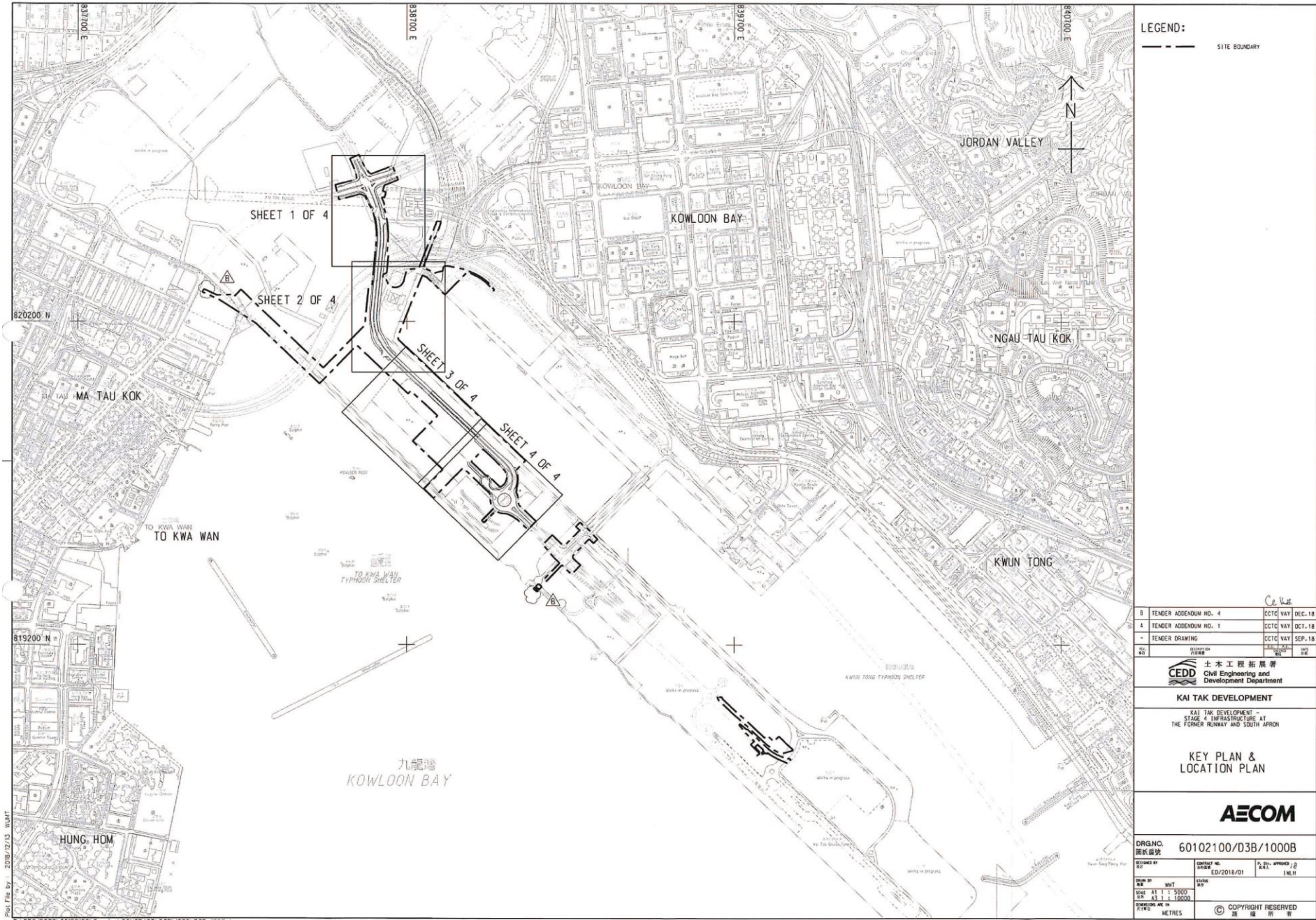


Figure 4 – Site Layout Plan



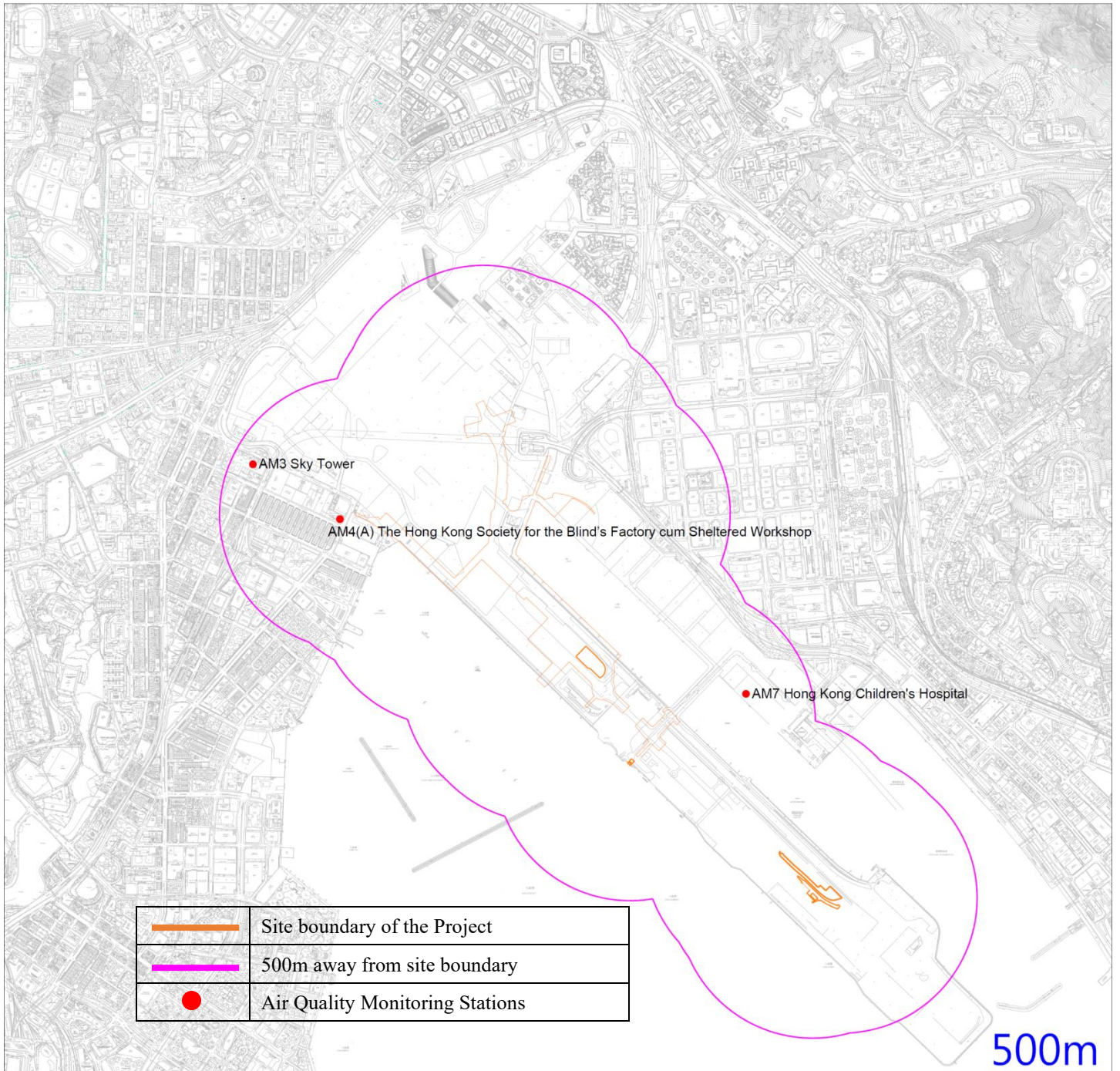


Figure 5 – Air Quality Monitoring Stations



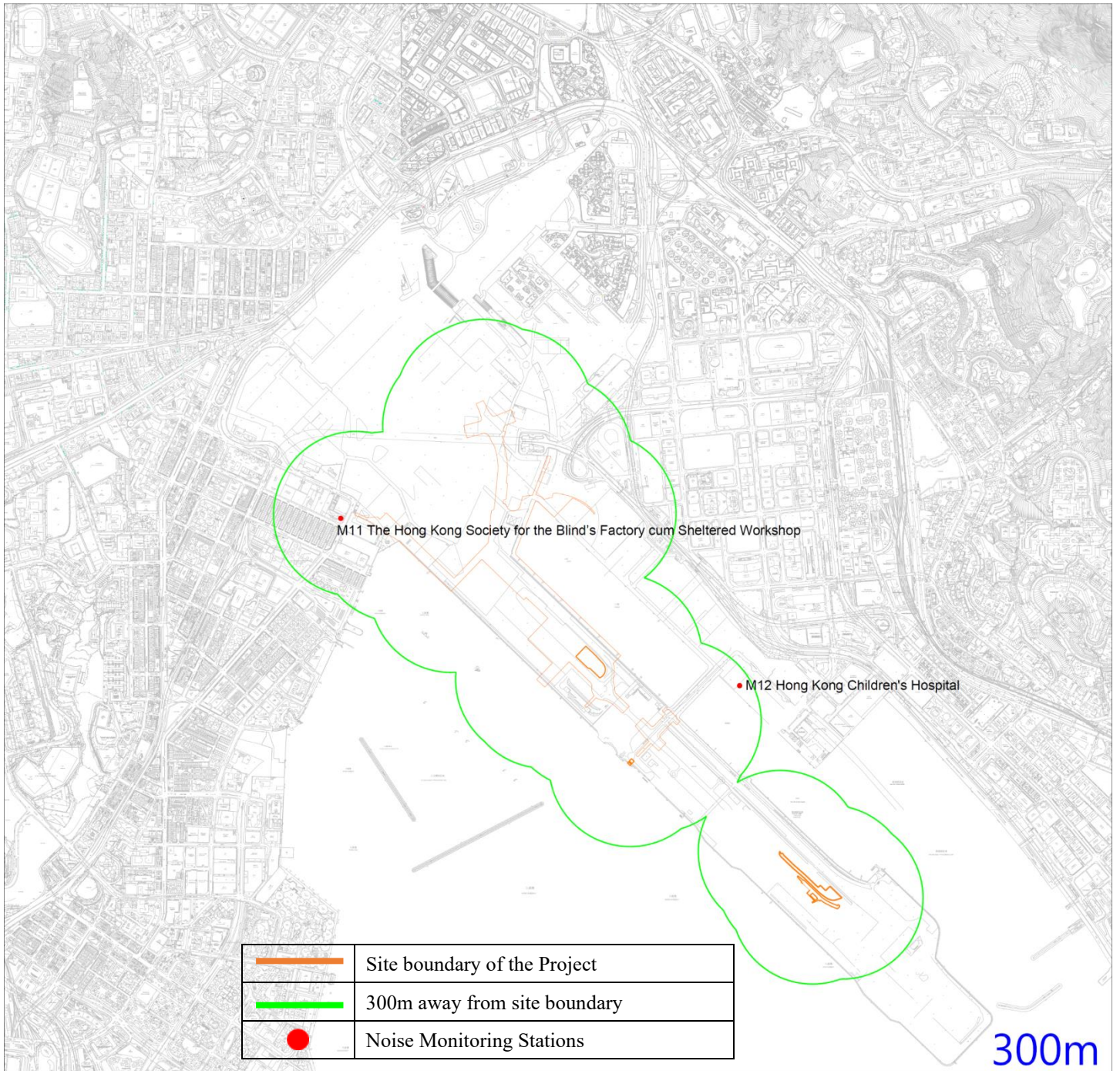


Figure 6 – Noise Monitoring Stations

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



# Appendix B – Construction Programme

























Contract No. ED/2018/01 KTD Project

ID	Task Name	Duration	Actual Duration	Remaining Duration	Physical % Complete	Early Start	Early Finish	Actual Start	Actual Finish	Late Start	Late Finish	Total Slack	TRA	Predecessors	2020				2021				2022				2023										
															Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2						
400	Prepare DDA (E&M works) and ICE certification (Final)	16 days	0 days	16 days	0%	Thu 4/3/21	Fri 19/3/21	NA	NA	Mon 8/3/21	Tue 23/3/21	4 days	1 day	399																							
401	Submit & endorse by PM and Statutory Authorities/Gov. Dept	61 days	0 days	61 days	0%	Sat 20/3/21	Wed 19/5/21	NA	NA	Wed 24/3/21	Sun 23/5/21	4 days	1 day	400																							
402	DCS Seawater & Intake Box Culverts (approx 88m) (Section 2)	479 days	304.41 days	174.59 days	0%	Tue 13/8/19	Thu 3/12/20	Tue 13/8/19	NA	Tue 13/8/19	Tue 3/8/21	243 days																									
403	Prepare AIP Subm with ICE certification (Draft)	165 days	165 days	0 days	100%	Tue 13/8/19	Fri 24/1/20	Tue 13/8/19	Fri 24/1/20	Tue 13/8/19	Fri 24/1/20	0 days	3 days																								
404	Submit & endorse by PM	85 days	85 days	0 days	100%	Thu 23/1/20	Thu 16/4/20	Thu 23/1/20	Thu 16/4/20	Thu 23/1/20	Thu 16/4/20	0 days	1 day	403																							
405	Submit & endorse by Statutory Authorities/Gov. Dept	90 days	90 days	0 days	100%	Fri 24/1/20	Mon 27/4/20	Fri 24/1/20	Mon 27/4/20	Fri 24/1/20	Mon 27/4/20	0 days	1 day	403																							
406	Prepare AIP and ICE certification (Final)	0 days	0 days	0 days	100%	Thu 23/4/20	Mon 27/4/20	Thu 23/4/20	Mon 27/4/20	Thu 23/4/20	Mon 27/4/20	0 days	1 days	403,405,404																							
407	Prepare DDA and ICE certification	80 days	0 days	80 days	0%	Sat 23/5/20	Mon 10/8/20	NA	NA	Thu 21/1/21	Sat 10/4/21	243 days	5 days	403SS,406FF+15																							
408	Submit & endorse by PM and Statutory Authorities/Gov. Dept	50 days	0 days	50 days	0%	Tue 11/8/20	Tue 29/9/20	NA	NA	Sun 11/4/21	Sun 30/5/21	243 days	3 days	407																							
409	Prepare DDA for and ICE certification (Final)	15 days	0 days	15 days	0%	Wed 30/9/20	Wed 14/10/20	NA	NA	Mon 31/5/21	Mon 14/6/21	243 days	1 day	408																							
410	Submit & endorse by PM and Statutory Authorities/Gov. Dept	50 days	0 days	50 days	0%	Thu 15/10/20	Thu 3/12/20	NA	NA	Tue 15/6/21	Tue 3/8/21	243 days	2 days	409																							
411	Seawater & Intake Box Culverts Diversion	248 days	49.98 days	198.02 days	0%	Wed 1/4/20	Fri 4/12/20	Wed 1/4/20	NA	Wed 1/4/20	Wed 6/10/21	306 days																									
412	Prepare AIP Subm (Draft)	32 days	32 days	0 days	100%	Wed 1/4/20	Sat 2/5/20	Wed 1/4/20	Sat 2/5/20	Wed 1/4/20	Sat 2/5/20	0 days	3 days																								
413	Submit & endorse by PM and Statutory Authorities/Gov. Dept	51 days	21 days	30 days	41%	Sat 2/5/20	Mon 22/6/20	Sat 2/5/20	NA	Sat 2/5/20	Tue 17/11/20	148 days	3 days	412																							
414	Prepare AIP and ICE certification (Final)	15 days	0 days	15 days	0%	Tue 23/6/20	Tue 7/7/20	NA	NA	Wed 18/11/20	Wed 2/12/20	148 days	1 days	412,413																							
415	Prepare DDA and ICE certification	50 days	0 days	50 days	0%	Tue 23/6/20	Tue 11/8/20	NA	NA	Sun 25/4/21	Sun 13/6/21	306 days	5 days	412SS,413FF+50																							
416	Submit & endorse by PM and Statutory Authorities/Gov. Dept	50 days	0 days	50 days	0%	Wed 12/8/20	Wed 30/9/20	NA	NA	Mon 14/6/21	Mon 2/8/21	306 days	3 days	415																							
417	Prepare DDA for and ICE certification (Final)	15 days	0 days	15 days	0%	Thu 1/10/20	Thu 15/10/20	NA	NA	Tue 3/8/21	Tue 17/8/21	306 days	1 day	416																							
418	Submit & endorse by PM and Statutory Authorities/Gov. Dept	50 days	0 days	50 days	0%	Fri 16/10/20	Fri 4/12/20	NA	NA	Wed 18/8/21	Wed 6/10/21	306 days	2 days	417																							
419	Rising Main (Sewerage Works)	402 days	134 days	268 days	0%	Thu 2/1/20	Sat 6/2/21	Thu 2/1/20	NA	Thu 2/1/20	Sun 7/3/21	29 days																									
420	Prepare AIP (Draft)	35 days	35 days	0 days	100%	Thu 2/1/20	Wed 5/2/20	Thu 2/1/20	Wed 5/2/20	Thu 2/1/20	Wed 5/2/20	0 days	3 days	4																							
421	Submit & endorse by PM	19 days	19 days	0 days	100%	Thu 6/2/20	Mon 24/2/20	Thu 6/2/20	Mon 24/2/20	Thu 6/2/20	Mon 24/2/20	0 days	1 day																								
422	Submit & endorse by PM and Statutory Authorities/Gov. Dept	56 days	56 days	0 days	100%	Thu 27/2/20	Fri 22/5/20	Thu 27/2/20	Fri 22/5/20	Thu 27/2/20	Fri 22/5/20	0 days	2 days	420																							
423	Prepare AIP and ICE certification (Final)	75 days	0 days	75 days	0%	Thu 2/7/20	Mon 14/9/20	NA	NA	Fri 31/7/20	Tue 13/10/20	29 days	0 days	420,422,421																							
424	Prepare DDA and ICE certification (Draft)	30 days	0 days	30 days	0%	Tue 15/9/20	Wed 14/10/20	NA	NA	Wed 14/10/20	Thu 12/11/20	29 days	4 days	420SS,423																							
425	Submit & endorse by PM and Statutory Authorities/Gov. Dept	50 days	0 days	50 days	0%	Thu 15/10/20	Thu 3/12/20	NA	NA	Fri 13/11/20	Fri 1/1/21	29 days	3 days	424,420																							
426	Prepare DDA and ICE certification (Final)	15 days	0 days	15 days	0%	Fri 4/12/20	Fri 18/12/20	NA	NA	Sat 2/1/21	Sat 16/1/21	29 days	0 days	425																							
427	Submit & endorse by PM and Statutory Authorities/Gov. Dept	50 days	0 days	50 days	0%	Sat 19/12/20	Sat 6/2/21	NA	NA	Sun 17/1/21	Sun 7/3/21	29 days	3 days	426,423																							
428	Stormwater, Sewage, Salt Water and Fresh Water Works for Underpass and Depressed Road	641 days	151.9 days	489.1 days	0%	Fri 13/9/19	Mon 14/6/21	Fri 13/9/19	NA	Fri 13/9/19	Mon 28/6/21	14 days																									
429	Stormwater Drainage AIP for Underpass and Depressed Roads and ICE certification (Draft)	72 days	72 days	0 days	100%	Mon 2/12/19	Tue 11/2/20	Mon 2/12/19	Tue 11/2/20	Mon 2/12/19	Tue 11/2/20	0 days	1 day																								
430	Submit & endorse by PM	51 days	51 days	0 days	30%	Wed 12/2/20	Thu 2/4/20	Wed 12/2/20	Thu 2/4/20	Wed 12/2/20	Thu 2/4/20	0 days	0.5 days	429																							
431	Submit & endorse by Statutory Authorities/Gov. Dept	139 days	64 days	75 days	46%	Fri 20/3/20	Wed 5/8/20	Fri 20/3/20	NA	Fri 20/3/20	Fri 30/10/20	86 days		429																							
432	Prepare AIP and ICE certification (Final)	150 days	50 days	100 days	33%	Fri 3/4/20	Sun 30/8/20	Fri 3/4/20	NA	Fri 3/4/20	Sat 14/11/20	76 days		431FF+15 days																							
433	Prepare DDA and ICE certification (Draft)	150 days	0 days	150 days	0%	Sat 23/5/20	Mon 19/10/20	NA	NA	Sat 18/7/20	Mon 14/12/20	56 days	1 day	429,432FF+30 d																							
434	Submit & endorse by PM and Statutory Authorities/Gov. Dept	90 days	0 days	90 days	0%	Tue 20/10/20	Sun 17/1/21	NA	NA	Tue 15/12/20	Sun 14/3/21	56 days	0.5 days	433																							
435	Prepare DDA and ICE certification (Final)	31 days	0 days	31 days	0%	Mon 18/1/21	Wed 17/2/21	NA	NA	Mon 15/3/21	Wed 14/4/21	56 days	1 day	434																							
436	Submit & endorse by PM and Statutory Authorities/Gov. Dept	75 days	0 days	75 days	0%	Thu 18/2/21	Mon 3/5/21	NA	NA	Thu 15/4/21	Mon 28/6/21	56 days	5 days	435																							
437	Fresh and Salt Water Works AIP for Underpass, Depressed Road and ICE certification (Draft)	51 days	51 days	0 days	100%	Tue 8/10/19	Wed 27/11/19	Tue 8/10/19	Wed 27/11/19	Tue 8/10/19	Wed 27/11/19	0 days	1 day																								
438	Submit & endorse by PM	26 days	26 days	0 days	100%	Thu 28/11/19	Mon 23/12/19	Thu 28/11/19	Mon 23/12/19	Thu 28/11/19	Mon 23/12/19	0 days	0.5 days	437																							
439	Submit & endorse by Statutory Authorities/Gov. Dept	14 days	14 days	0 days	100%	Wed 8/4/20	Fri 24/4/20	Wed 8/4/20	Fri 24/4/20	Wed 8/4/20	Fri 24/4/20	0 days	3 days	437																							
440	Prepare AIP for Underpass, Depressed Road and ICE certification (Final)	22 days	22 days	0 days	100%	Sat 25/4/20	Sat 16/5/20	Sat 25/4/20	Sat 16/5/20	Sat 25/4/20	Sat 16/5/20	0 days	0 days	438,439																							
441	Prepare DDA for Underpass, Depressed Road and ICE certification (Draft)	90 days	0 days	90 days	0%	Sun 17/																															

















Contract No. ED/2018/01 KTD Project

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

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

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



















































**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 August 2022

August 2022

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

**Air Quality Monitoring Station**

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

**Noise Quality Monitoring Station**

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

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

September 2022

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

NOTE:

- 1) Site inspection schedule and Impact monitoring schedule may be changed due to unforeseen circumstance (e.g. adverse weather).
- 2) Due to the relocation of The Hong Kong Society for the Blind's Factory cum Sheltered Workshop (AM4(A) and M11), the premises owner rejected ET to conduct impact monitoring starting from 1 Sept 2022. No 24-TSP monitoring will be conducted at AM4(A) while 1-hr TSP at AM4(A) and 30-min noise monitoring at M11 will be conducted on the ground floor with orienting to the Project site. ET will resume the impact monitoring once the alternative monitoring location for AM4(A) and M11 are confirmed.

**Air Quality Monitoring Station**

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

**Noise Quality Monitoring Station**

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

**Appendix D – Photographic records**



Impact Air Quality Monitoring



Measurement setup at AM3



Measurement setup at AM4(A)

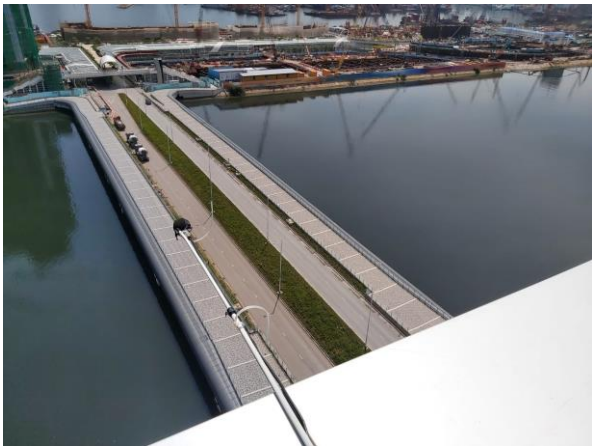


Measurement setup at AM7

Impact Noise Monitoring



Measurement setup at M11



Measurement setup at M12



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



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

## Catalogue of High Volume Sampler (HVS)



### TSP MFC

Total Suspended Particulate, Mass Flow Controlled



**MFC TSP**  
Ambient Air Sampler

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

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

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

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Tisch Environmental  
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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-01-2022062901      Date of calibration : 29/06/2022

Location : Sky Tower      Sampler : TE-5170X

**Calibration Data**

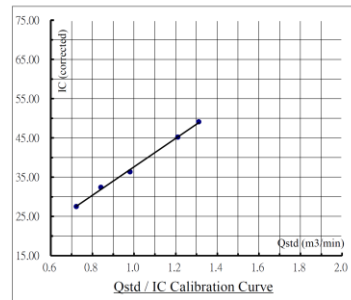
Ambient barometric pressure, Pa = 751.6 ( mmHg )      Ambient temperature, Ta = 305.65 ( deg K )  
 Qstd Slope, m = 2.06418      Qstd Intercept, b = -0.035930

**Calibration Curve**

Plate No.	H <sub>2</sub> O (in)	Qstd (m <sup>3</sup> /min)	I (chart)	IC (corrected)
18	7.40	1.311	50.0	49.10
13	6.30	1.211	46.0	45.17
10	4.10	0.981	37.0	36.33
7	3.00	0.841	33.0	32.40
5	2.20	0.723	28.0	27.49

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1/m [ (1) ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	36.223	1.3899	0.9989



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

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

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

Form No. DNS-HVS-CAL 3d 16 01 2020

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

Calibration curve ref. No. : ATSPC-01-2022082601      Date of calibration : 26/08/2022

Location : Sky Tower      Sampler : TE-5170X

**Calibration Data**

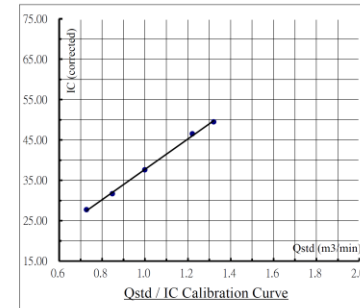
Ambient barometric pressure, Pa = 757.6 ( mmHg )      Ambient temperature, Ta = 303.45 ( deg K )  
 Qstd Slope, m = 2.06418      Qstd Intercept, b = -0.035930

**Calibration Curve**

Plate No.	H <sub>2</sub> O (in)	Qstd (m <sup>3</sup> /min)	I (chart)	IC (corrected)
18	7.40	1.321	50.0	49.47
13	6.30	1.221	47.0	46.50
10	4.20	1.000	38.0	37.60
7	3.00	0.848	32.0	31.66
5	2.20	0.728	28.0	27.70

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1/m [ (1) ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	37.600	0.0989	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 : Poon Tsz Wing      Checked by : Wong Yin Tong  
 Name : ( Poon Tsz Wing )      Name : ( Wong Yin Tong )

Form No. DNS-HVS-CAL 3d 16 01 2020

## Calibration Certificate of HVS

### Air Sampler Calibration Curve Plotting & Calculation

(Dickson recorder)

Calibration curve ref. No. : ATSPC-01-2022062902      Date of calibration : 29/06/2022  
 The Hong Kong Society for the Blind's  
 Location : Factory cum Sheltered Workshop      Sampler : TE-5170X

**Calibration Data**

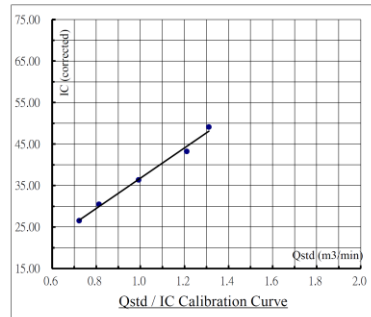
Ambient barometric pressure, Pa = 751.6 ( mmHg )      Ambient temperature, Ta = 305.65 ( deg K )  
 Qstd Slope, m = 2.06418      Qstd Intercept, b = -0.035930

**Calibration Curve**

Plate No.	H <sub>2</sub> O ( in )	Qstd ( m <sup>3</sup> / min )	I ( chart )	IC ( corrected )
18	7.40	1.311	50.0	49.10
13	6.30	1.211	44.0	43.21
10	4.20	0.992	37.0	36.33
7	2.80	0.813	31.0	30.44
5	2.20	0.723	27.0	26.51

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1 / m [ ( 1 ) ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	36.456	0.2973	0.9958



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

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

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

Form No. INS-HVS-CAL.dtl 16.01.2020

### Air Sampler Calibration Curve Plotting & Calculation

(Dickson recorder)

Calibration curve ref. No. : ATSPC-01-2022082602      Date of calibration : 26/08/2022  
 The Hong Kong Society for the Blind's  
 Location : Factory cum Sheltered Workshop      Sampler : TE-5170X

**Calibration Data**

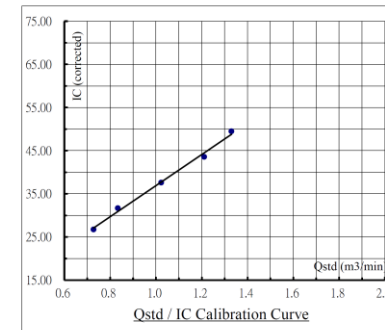
Ambient barometric pressure, Pa = 757.6 ( mmHg )      Ambient temperature, Ta = 303.45 ( deg K )  
 Qstd Slope, m = 2.06418      Qstd Intercept, b = -0.035930

**Calibration Curve**

Plate No.	H <sub>2</sub> O ( in )	Qstd ( m <sup>3</sup> / min )	I ( chart )	IC ( corrected )
18	7.50	1.330	50.0	49.47
13	6.20	1.211	44.0	43.53
10	4.40	1.023	38.0	37.60
7	2.90	0.834	32.0	31.66
5	2.20	0.728	27.0	26.71

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1 / m [ ( 1 ) ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	36.034	0.8516	0.9968



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

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

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

Form No. INS-HVS-CAL.dtl 16.01.2020

## Calibration Certificate of HVS

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

Calibration curve ref. No. : ATSPC-01-2022062903 Date of calibration : 29/06/2022

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

**Calibration Data**

Ambient barometric pressure, Pa = 751.6 ( mmHg ) Ambient temperature, Ta = 305.65 ( deg K )

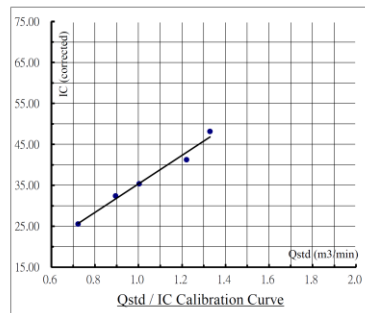
Qstd Slope, m = 2.06418 Qstd Intercept, b = -0.035930

**Calibration Curve**

Plate No.	H <sub>2</sub> O (in)	Qstd (m <sup>3</sup> /min)	I (chart)	IC (corrected)
18	7.60	1.329	49.0	48.12
13	6.40	1.221	42.0	41.24
10	4.30	1.004	36.0	35.35
7	3.40	0.895	33.0	32.40
5	2.20	0.723	26.0	25.53

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1/m [ ( I ) ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	34.864	0.4644	0.9906



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. DNS-HVS-CAL-01/16/01/2020

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

Calibration curve ref. No. : ATSPC-01-2022082603 Date of calibration : 26/08/2022

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

**Calibration Data**

Ambient barometric pressure, Pa = 750.9 ( mmHg ) Ambient temperature, Ta = 303.45 ( deg K )

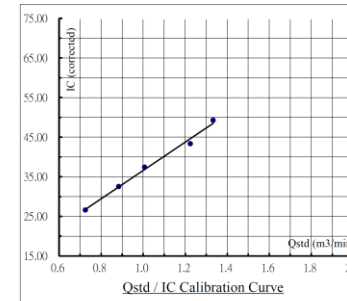
Qstd Slope, m = 2.06418 Qstd Intercept, b = -0.035930

**Calibration Curve**

Plate No.	H <sub>2</sub> O (in)	Qstd (m <sup>3</sup> /min)	I (chart)	IC (corrected)
18	7.60	1.333	50.0	49.25
13	6.40	1.225	44.0	43.34
10	4.30	1.007	38.0	37.43
7	3.30	0.884	33.0	32.51
5	2.20	0.725	27.0	26.60

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1/m [ ( I ) ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	35.757	0.8242	0.9958



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. DNS-HVS-CAL-01/16/01/2020



# Orifice Transfer Standard Certification Worksheet TE-5025A



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

## Certificate of Calibration

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

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

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

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

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

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



## Catalogue of Dust Meter (TSI Sidepak AM510)

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

### User Friendly

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

### Advanced Features

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

### Quick and Easy Reports

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

### Power to Spare

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

### Model AMS10

#### SidePak Personal Aerosol Monitor

#### Sensitivity

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

#### Flow Rate

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

#### Temperature Range

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

#### Operational Humidity

0 to 95% RH, non-condensing

#### Time Constant (LCD display)

Range User-adjustable, 1 to 60 seconds

#### Data Logging

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

#### User-Select Calibration Factors

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

#### Physical

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

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

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

### Maintenance

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

### Communications Interface

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

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

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

### Battery Performance

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

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

### Battery Level Indicator

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







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

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

Environment Conditions		Model	AM510
Temperature	75.26 (24.0) °F (°C)	Serial Number	11108001
Relative Humidity	21.5 %RH		
Barometric Pressure	29.25 (990.5) 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	4.199	4.027	3.779-4.619	3	0.161	0.158	0.113-0.209	
2	0.543	0.549	0.462-0.624	4	13.855	14.276	12.469-15.241	

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	08-30-21	02-28-22
Microbalance	M001324	01-29-21	01-31-23	Pressure	E003511	10-26-21	10-31-22
Flowmeter	E005626	03-09-21	03-31-22	DC Voltage	E003315	01-11-21	01-31-22

December 17, 2021

Calibrated      Date

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

Performance Check ref. No. AS0220624-2      Report Issue Date 24/06/2022  
 Date of performance check 23/06/2022

**Objective:**

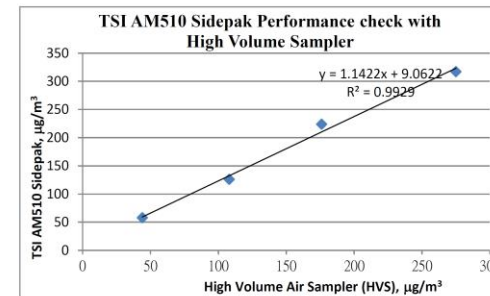
A dust meter and a Total Suspended Particulate High Volume Air Sampler (HVS) were placed together to measure the Total Suspended Particulate (TSP) concentrations simultaneously to check the performance.

**Equipment Used:**

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

**Result:**

Equipment	Measurement Result, µg/m <sup>3</sup>			
TSI AM510 Sidepak	58	126	224	317
High Volume Air Sampler (HVS)	44	108	176	275



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

Form No. ENV CAL SAMPLER CC1 (4/12/12/2003)



# 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

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

# Calibration Certificate of Weather Station

*Actual calibration date: 10 Mar 2022*



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

**Calibration Certificate No.: CC0012203**

**Customer Information**

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

**Equipment Identification**

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

**Certificate Information**

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

**Reference Equipment Identification**

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

Note1: The estimated expanded uncertainties have been calculated in "Evaluation and expression of uncertainty in measurement" and give an internal estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.  
 Note2: The standard (s) and instrument used in the calibration are traceable to national or international recognized standard and are calibrated on a schedule to maintain the accuracy and good condition.  
 Note3: The result reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long term stability of the instrument.  
 Note4: The result shows in this calibration certificate relate only to the item calibrated, and the result only applies to the calibration item as received.

Approved By:

Rex Tse

Company Chop:



Certificate Issue Date: 18 March 2022

CF-BEG-03

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

CC0012203  
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**Appendix F – Weather information**

## General Information

Date	Absolute Daily Min Temperature (°C)	Absolute Daily Max Temperature (°C)	Total Rainfall (mm)
01/08/2022	29.1	35.7	0
02/08/2022	28	35.2	0.2
03/08/2022	25.6	30.8	34.9
04/08/2022	25.9	28.4	14.9
05/08/2022	24.5	28.6	165.5
06/08/2022	26.1	30.9	5.5
07/08/2022	27.6	32.6	2.8
08/08/2022	26.2	30.9	33.3
09/08/2022	25.4	28.5	72
10/08/2022	25.8	29.6	49.7
11/08/2022	25.5	28.8	12.4
12/08/2022	24.9	27.1	76
13/08/2022	25.8	32.6	0
14/08/2022	26.9	33.3	0
15/08/2022	28.1	33.6	0
16/08/2022	26.2	33.2	9.1
17/08/2022	26.2	32.3	29.8
18/08/2022	26.2	30.4	22.1
19/08/2022	26.4	32	4.8
20/08/2022	26.5	31.9	8.4
21/08/2022	26.6	32.9	1.9
22/08/2022	28.2	32.9	0
23/08/2022	28.6	34.5	0
24/08/2022	26.4	34.9	5.5
25/08/2022	25	29.8	48.1
26/08/2022	27.5	32.9	0.1
27/08/2022	27.4	33	0
28/08/2022	28.3	34.4	0
29/08/2022	28.6	34.6	0
30/08/2022	27.9	32.3	13.1
31/08/2022	28.1	31.7	4.7

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

NOTE2: Trace means rainfall less than 0.05 mm

<https://www.hko.gov.hk/en/cis/dailyExtract.htm?y=2022&m=08>

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
01/08/2022	0:00	0.4	247.5	02/08/2022	0:00	0.4	270	03/08/2022	0:00	2.2	67.5	04/08/2022	0:00	2.7	90
01/08/2022	1:00	0.4	270	02/08/2022	1:00	0.4	247.5	03/08/2022	1:00	2.2	67.5	04/08/2022	1:00	2.7	157.5
01/08/2022	2:00	0.4	247.5	02/08/2022	2:00	0.4	315	03/08/2022	2:00	2.2	67.5	04/08/2022	2:00	3.1	270
01/08/2022	3:00	0.9	247.5	02/08/2022	3:00	0.9	135	03/08/2022	3:00	1.8	45	04/08/2022	3:00	2.7	90
01/08/2022	4:00	0.4	247.5	02/08/2022	4:00	1.3	135	03/08/2022	4:00	1.3	67.5	04/08/2022	4:00	3.1	247.5
01/08/2022	5:00	0.9	247.5	02/08/2022	5:00	1.3	157.5	03/08/2022	5:00	1.8	45	04/08/2022	5:00	3.1	112.5
01/08/2022	6:00	0.9	247.5	02/08/2022	6:00	1.8	202.5	03/08/2022	6:00	2.2	67.5	04/08/2022	6:00	2.7	270
01/08/2022	7:00	0.4	270	02/08/2022	7:00	0.9	292.5	03/08/2022	7:00	1.8	67.5	04/08/2022	7:00	3.1	157.5
01/08/2022	8:00	0.4	247.5	02/08/2022	8:00	0.9	270	03/08/2022	8:00	1.8	67.5	04/08/2022	8:00	2.7	112.5
01/08/2022	9:00	0.4	270	02/08/2022	9:00	0.9	270	03/08/2022	9:00	2.2	90	04/08/2022	9:00	3.1	270
01/08/2022	10:00	0.4	270	02/08/2022	10:00	0.9	225	03/08/2022	10:00	2.2	112.5	04/08/2022	10:00	3.6	247.5
01/08/2022	11:00	0.4	270	02/08/2022	11:00	0.4	247.5	03/08/2022	11:00	2.2	90	04/08/2022	11:00	2.7	247.5
01/08/2022	12:00	0.9	270	02/08/2022	12:00	0.4	225	03/08/2022	12:00	2.7	67.5	04/08/2022	12:00	3.1	225
01/08/2022	13:00	0.4	247.5	02/08/2022	13:00	0.4	247.5	03/08/2022	13:00	2.2	67.5	04/08/2022	13:00	3.1	112.5
01/08/2022	14:00	0.4	247.5	02/08/2022	14:00	0.9	247.5	03/08/2022	14:00	1.8	67.5	04/08/2022	14:00	3.6	112.5
01/08/2022	15:00	0.9	247.5	02/08/2022	15:00	0.4	247.5	03/08/2022	15:00	2.2	45	04/08/2022	15:00	2.7	90
01/08/2022	16:00	0.9	247.5	02/08/2022	16:00	0.4	270	03/08/2022	16:00	1.8	112.5	04/08/2022	16:00	3.6	90
01/08/2022	17:00	0.9	247.5	02/08/2022	17:00	0.9	247.5	03/08/2022	17:00	1.3	135	04/08/2022	17:00	3.6	112.5
01/08/2022	18:00	0.9	270	02/08/2022	18:00	1.3	247.5	03/08/2022	18:00	1.3	157.5	04/08/2022	18:00	2.2	90
01/08/2022	19:00	0.9	247.5	02/08/2022	19:00	0.9	67.5	03/08/2022	19:00	1.3	90	04/08/2022	19:00	3.6	112.5
01/08/2022	20:00	0.9	270	02/08/2022	20:00	0.4	112.5	03/08/2022	20:00	0.9	135	04/08/2022	20:00	2.7	90
01/08/2022	21:00	1.3	270	02/08/2022	21:00	1.3	135	03/08/2022	21:00	1.3	112.5	04/08/2022	21:00	2.7	67.5
01/08/2022	22:00	1.3	90	02/08/2022	22:00	1.3	112.5	03/08/2022	22:00	1.3	247.5	04/08/2022	22:00	2.7	135
01/08/2022	23:00	0.4	90	02/08/2022	23:00	0.9	247.5	03/08/2022	23:00	1.3	247.5	04/08/2022	23:00	3.1	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
05/08/2022	0:00	3.6	112.5	06/08/2022	0:00	3.1	247.5	07/08/2022	0:00	1.8	90	08/08/2022	0:00	0.4	90
05/08/2022	1:00	2.7	135	06/08/2022	1:00	3.6	270	07/08/2022	1:00	2.2	45	08/08/2022	1:00	0.9	90
05/08/2022	2:00	2.2	90	06/08/2022	2:00	2.7	247.5	07/08/2022	2:00	2.2	225	08/08/2022	2:00	0.9	112.5
05/08/2022	3:00	3.1	67.5	06/08/2022	3:00	3.1	247.5	07/08/2022	3:00	2.2	112.5	08/08/2022	3:00	1.3	90
05/08/2022	4:00	2.2	90	06/08/2022	4:00	3.6	247.5	07/08/2022	4:00	2.2	67.5	08/08/2022	4:00	1.3	90
05/08/2022	5:00	2.7	112.5	06/08/2022	5:00	3.1	90	07/08/2022	5:00	1.8	225	08/08/2022	5:00	1.3	112.5
05/08/2022	6:00	2.2	67.5	06/08/2022	6:00	3.1	45	07/08/2022	6:00	2.2	225	08/08/2022	6:00	1.3	135
05/08/2022	7:00	1.8	112.5	06/08/2022	7:00	3.1	225	07/08/2022	7:00	2.2	247.5	08/08/2022	7:00	1.3	112.5
05/08/2022	8:00	2.7	90	06/08/2022	8:00	3.6	90	07/08/2022	8:00	1.8	247.5	08/08/2022	8:00	0.4	112.5
05/08/2022	9:00	4	112.5	06/08/2022	9:00	3.1	112.5	07/08/2022	9:00	2.2	247.5	08/08/2022	9:00	0.4	135
05/08/2022	10:00	5.4	112.5	06/08/2022	10:00	3.6	90	07/08/2022	10:00	2.2	247.5	08/08/2022	10:00	0.9	135
05/08/2022	11:00	3.6	90	06/08/2022	11:00	4.9	112.5	07/08/2022	11:00	2.2	270	08/08/2022	11:00	0.9	112.5
05/08/2022	12:00	4	90	06/08/2022	12:00	3.1	67.5	07/08/2022	12:00	2.2	247.5	08/08/2022	12:00	1.3	90
05/08/2022	13:00	3.1	67.5	06/08/2022	13:00	3.1	112.5	07/08/2022	13:00	1.3	247.5	08/08/2022	13:00	0.9	135
05/08/2022	14:00	3.6	45	06/08/2022	14:00	4	90	07/08/2022	14:00	0.9	225	08/08/2022	14:00	0.9	135
05/08/2022	15:00	4.5	90	06/08/2022	15:00	4	67.5	07/08/2022	15:00	0.9	202.5	08/08/2022	15:00	0.9	112.5
05/08/2022	16:00	4.9	67.5	06/08/2022	16:00	3.1	67.5	07/08/2022	16:00	1.3	225	08/08/2022	16:00	0.4	112.5
05/08/2022	17:00	4.5	90	06/08/2022	17:00	3.1	67.5	07/08/2022	17:00	1.3	247.5	08/08/2022	17:00	0.9	112.5
05/08/2022	18:00	3.6	157.5	06/08/2022	18:00	3.6	90	07/08/2022	18:00	1.3	225	08/08/2022	18:00	0.4	112.5
05/08/2022	19:00	3.6	270	06/08/2022	19:00	3.1	90	07/08/2022	19:00	1.3	225	08/08/2022	19:00	0.4	112.5
05/08/2022	20:00	3.6	90	06/08/2022	20:00	4	90	07/08/2022	20:00	1.3	112.5	08/08/2022	20:00	0.9	90
05/08/2022	21:00	3.6	247.5	06/08/2022	21:00	2.2	112.5	07/08/2022	21:00	1.3	90	08/08/2022	21:00	0.4	90
05/08/2022	22:00	3.1	112.5	06/08/2022	22:00	2.7	112.5	07/08/2022	22:00	1.3	112.5	08/08/2022	22:00	0.9	112.5
05/08/2022	23:00	5.4	270	06/08/2022	23:00	3.6	90	07/08/2022	23:00	0.9	112.5	08/08/2022	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
09/08/2022	0:00	1.8	112.5	10/08/2022	0:00	0.9	247.5	11/08/2022	0:00	1.3	90	12/08/2022	0:00	1.8	90
09/08/2022	1:00	0.9	135	10/08/2022	1:00	1.8	247.5	11/08/2022	1:00	0.9	90	12/08/2022	1:00	1.8	67.5
09/08/2022	2:00	1.3	112.5	10/08/2022	2:00	1.8	247.5	11/08/2022	2:00	0.9	112.5	12/08/2022	2:00	1.8	90
09/08/2022	3:00	0.9	90	10/08/2022	3:00	1.3	270	11/08/2022	3:00	0.9	135	12/08/2022	3:00	2.7	135
09/08/2022	4:00	1.3	135	10/08/2022	4:00	1.3	247.5	11/08/2022	4:00	1.3	112.5	12/08/2022	4:00	2.2	112.5
09/08/2022	5:00	1.8	90	10/08/2022	5:00	1.8	247.5	11/08/2022	5:00	1.3	112.5	12/08/2022	5:00	2.7	247.5
09/08/2022	6:00	2.2	90	10/08/2022	6:00	1.3	247.5	11/08/2022	6:00	1.3	112.5	12/08/2022	6:00	3.1	247.5
09/08/2022	7:00	1.8	112.5	10/08/2022	7:00	1.8	247.5	11/08/2022	7:00	1.3	112.5	12/08/2022	7:00	3.6	67.5
09/08/2022	8:00	1.3	112.5	10/08/2022	8:00	1.3	270	11/08/2022	8:00	1.3	135	12/08/2022	8:00	1.8	22.5
09/08/2022	9:00	1.8	112.5	10/08/2022	9:00	1.8	112.5	11/08/2022	9:00	1.3	135	12/08/2022	9:00	2.7	135
09/08/2022	10:00	2.2	112.5	10/08/2022	10:00	2.2	270	11/08/2022	10:00	1.3	247.5	12/08/2022	10:00	0.4	180
09/08/2022	11:00	1.3	90	10/08/2022	11:00	1.3	45	11/08/2022	11:00	1.3	247.5	12/08/2022	11:00	0.9	337.5
09/08/2022	12:00	1.8	90	10/08/2022	12:00	1.3	270	11/08/2022	12:00	1.8	270	12/08/2022	12:00	1.3	22.5
09/08/2022	13:00	1.8	112.5	10/08/2022	13:00	0.9	225	11/08/2022	13:00	2.7	247.5	12/08/2022	13:00	1.3	67.5
09/08/2022	14:00	1.8	112.5	10/08/2022	14:00	1.8	270	11/08/2022	14:00	0.9	247.5	12/08/2022	14:00	1.3	337.5
09/08/2022	15:00	1.8	112.5	10/08/2022	15:00	0.9	270	11/08/2022	15:00	1.8	247.5	12/08/2022	15:00	0.9	22.5
09/08/2022	16:00	1.3	112.5	10/08/2022	16:00	0.9	112.5	11/08/2022	16:00	1.3	225	12/08/2022	16:00	2.2	22.5
09/08/2022	17:00	1.3	112.5	10/08/2022	17:00	1.3	112.5	11/08/2022	17:00	1.8	247.5	12/08/2022	17:00	2.2	315
09/08/2022	18:00	1.8	90	10/08/2022	18:00	1.3	135	11/08/2022	18:00	1.8	135	12/08/2022	18:00	1.8	90
09/08/2022	19:00	2.2	112.5	10/08/2022	19:00	1.8	135	11/08/2022	19:00	1.3	90	12/08/2022	19:00	1.8	112.5
09/08/2022	20:00	2.2	112.5	10/08/2022	20:00	1.3	112.5	11/08/2022	20:00	1.8	292.5	12/08/2022	20:00	2.2	112.5
09/08/2022	21:00	2.2	112.5	10/08/2022	21:00	1.8	90	11/08/2022	21:00	1.3	292.5	12/08/2022	21:00	1.3	112.5
09/08/2022	22:00	1.8	90	10/08/2022	22:00	1.3	135	11/08/2022	22:00	2.7	292.5	12/08/2022	22:00	1.8	135
09/08/2022	23:00	1.3	112.5	10/08/2022	23:00	1.3	112.5	11/08/2022	23:00	1.3	135	12/08/2022	23:00	2.2	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
13/08/2022	0:00	1.3	90	14/08/2022	0:00	0.9	112.5	15/08/2022	0:00	0.9	135	16/08/2022	0:00	0.4	135
13/08/2022	1:00	1.3	90	14/08/2022	1:00	1.3	90	15/08/2022	1:00	0.9	135	16/08/2022	1:00	0.4	112.5
13/08/2022	2:00	0.4	225	14/08/2022	2:00	0.9	270	15/08/2022	2:00	0.9	112.5	16/08/2022	2:00	0.4	112.5
13/08/2022	3:00	0.9	225	14/08/2022	3:00	0.9	135	15/08/2022	3:00	0.9	90	16/08/2022	3:00	0.4	67.5
13/08/2022	4:00	0.4	270	14/08/2022	4:00	0.9	135	15/08/2022	4:00	0.4	112.5	16/08/2022	4:00	0.4	45
13/08/2022	5:00	0.9	292.5	14/08/2022	5:00	0.9	112.5	15/08/2022	5:00	0.4	135	16/08/2022	5:00	0.4	67.5
13/08/2022	6:00	0.9	270	14/08/2022	6:00	1.3	247.5	15/08/2022	6:00	0.4	270	16/08/2022	6:00	0.9	45
13/08/2022	7:00	0.9	292.5	14/08/2022	7:00	0.9	202.5	15/08/2022	7:00	0.4	270	16/08/2022	7:00	0.4	67.5
13/08/2022	8:00	0.4	270	14/08/2022	8:00	1.3	112.5	15/08/2022	8:00	0.4	270	16/08/2022	8:00	0.4	67.5
13/08/2022	9:00	0.9	270	14/08/2022	9:00	1.3	135	15/08/2022	9:00	0.9	225	16/08/2022	9:00	0.4	67.5
13/08/2022	10:00	0.9	90	14/08/2022	10:00	0.9	112.5	15/08/2022	10:00	0.9	225	16/08/2022	10:00	0.9	90
13/08/2022	11:00	1.3	112.5	14/08/2022	11:00	0.9	112.5	15/08/2022	11:00	1.3	202.5	16/08/2022	11:00	0.9	112.5
13/08/2022	12:00	0.9	270	14/08/2022	12:00	0.9	112.5	15/08/2022	12:00	1.3	247.5	16/08/2022	12:00	1.3	90
13/08/2022	13:00	0.4	112.5	14/08/2022	13:00	0.9	337.5	15/08/2022	13:00	1.3	270	16/08/2022	13:00	1.3	67.5
13/08/2022	14:00	0	135	14/08/2022	14:00	0.9	22.5	15/08/2022	14:00	1.3	247.5	16/08/2022	14:00	0.4	67.5
13/08/2022	15:00	0	135	14/08/2022	15:00	0.9	315	15/08/2022	15:00	0.4	247.5	16/08/2022	15:00	0.4	67.5
13/08/2022	16:00	0.4	112.5	14/08/2022	16:00	1.3	112.5	15/08/2022	16:00	0.9	247.5	16/08/2022	16:00	0.4	45
13/08/2022	17:00	0.9	112.5	14/08/2022	17:00	0.9	67.5	15/08/2022	17:00	0.4	225	16/08/2022	17:00	1.3	112.5
13/08/2022	18:00	0.9	112.5	14/08/2022	18:00	0.9	292.5	15/08/2022	18:00	0.9	22.5	16/08/2022	18:00	1.3	112.5
13/08/2022	19:00	0	135	14/08/2022	19:00	1.3	247.5	15/08/2022	19:00	1.3	67.5	16/08/2022	19:00	1.3	90
13/08/2022	20:00	0.4	112.5	14/08/2022	20:00	1.8	247.5	15/08/2022	20:00	1.8	135	16/08/2022	20:00	1.3	45
13/08/2022	21:00	0.4	112.5	14/08/2022	21:00	1.3	225	15/08/2022	21:00	1.3	112.5	16/08/2022	21:00	1.8	112.5
13/08/2022	22:00	0.4	90	14/08/2022	22:00	1.8	247.5	15/08/2022	22:00	1.3	112.5	16/08/2022	22:00	2.7	270
13/08/2022	23:00	0.4	135	14/08/2022	23:00	1.3	225	15/08/2022	23:00	1.3	112.5	16/08/2022	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
17/08/2022	0:00	0.4	112.5	18/08/2022	0:00	1.3	270	19/08/2022	0:00	1.3	337.5	20/08/2022	0:00	1.8	67.5
17/08/2022	1:00	0.4	180	18/08/2022	1:00	1.3	315	19/08/2022	1:00	1.3	22.5	20/08/2022	1:00	0.9	247.5
17/08/2022	2:00	0.9	135	18/08/2022	2:00	1.3	45	19/08/2022	2:00	1.3	315	20/08/2022	2:00	2.2	247.5
17/08/2022	3:00	0.9	112.5	18/08/2022	3:00	1.3	270	19/08/2022	3:00	1.3	112.5	20/08/2022	3:00	0.9	90
17/08/2022	4:00	1.3	135	18/08/2022	4:00	1.3	247.5	19/08/2022	4:00	1.3	67.5	20/08/2022	4:00	0.9	90
17/08/2022	5:00	0.9	135	18/08/2022	5:00	1.3	247.5	19/08/2022	5:00	0.9	292.5	20/08/2022	5:00	0.4	135
17/08/2022	6:00	0.9	112.5	18/08/2022	6:00	0.9	270	19/08/2022	6:00	0.9	112.5	20/08/2022	6:00	0.4	135
17/08/2022	7:00	0.9	135	18/08/2022	7:00	0.9	247.5	19/08/2022	7:00	0.9	292.5	20/08/2022	7:00	0.9	112.5
17/08/2022	8:00	1.3	157.5	18/08/2022	8:00	0.9	247.5	19/08/2022	8:00	0.9	45	20/08/2022	8:00	0.9	112.5
17/08/2022	9:00	1.3	90	18/08/2022	9:00	0.9	270	19/08/2022	9:00	0.4	67.5	20/08/2022	9:00	0.4	112.5
17/08/2022	10:00	0.9	135	18/08/2022	10:00	1.3	90	19/08/2022	10:00	0.9	22.5	20/08/2022	10:00	0.9	90
17/08/2022	11:00	1.8	112.5	18/08/2022	11:00	0.9	67.5	19/08/2022	11:00	0.9	157.5	20/08/2022	11:00	0.9	112.5
17/08/2022	12:00	1.3	90	18/08/2022	12:00	1.3	90	19/08/2022	12:00	0.9	67.5	20/08/2022	12:00	0.9	90
17/08/2022	13:00	1.3	90	18/08/2022	13:00	0.9	90	19/08/2022	13:00	0.4	135	20/08/2022	13:00	0.9	112.5
17/08/2022	14:00	0.9	135	18/08/2022	14:00	2.7	90	19/08/2022	14:00	0.9	90	20/08/2022	14:00	0.9	180
17/08/2022	15:00	1.3	90	18/08/2022	15:00	2.2	90	19/08/2022	15:00	0.9	157.5	20/08/2022	15:00	0.9	247.5
17/08/2022	16:00	0.9	135	18/08/2022	16:00	1.8	67.5	19/08/2022	16:00	0.9	157.5	20/08/2022	16:00	0.9	225
17/08/2022	17:00	1.3	90	18/08/2022	17:00	1.3	90	19/08/2022	17:00	0.4	135	20/08/2022	17:00	1.3	225
17/08/2022	18:00	1.8	90	18/08/2022	18:00	1.8	112.5	19/08/2022	18:00	0.4	90	20/08/2022	18:00	0.4	247.5
17/08/2022	19:00	1.3	90	18/08/2022	19:00	1.3	67.5	19/08/2022	19:00	0.9	135	20/08/2022	19:00	0.4	247.5
17/08/2022	20:00	1.3	90	18/08/2022	20:00	1.3	112.5	19/08/2022	20:00	0.9	112.5	20/08/2022	20:00	0.4	247.5
17/08/2022	21:00	1.3	67.5	18/08/2022	21:00	0.9	90	19/08/2022	21:00	0.9	157.5	20/08/2022	21:00	0.4	315
17/08/2022	22:00	1.3	67.5	18/08/2022	22:00	0.9	112.5	19/08/2022	22:00	0.4	270	20/08/2022	22:00	1.8	270
17/08/2022	23:00	0.9	90	18/08/2022	23:00	0.9	112.5	19/08/2022	23:00	0.4	112.5	20/08/2022	23:00	1.8	270

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
21/08/2022	0:00	1.8	112.5	22/08/2022	0:00	0.9	90	23/08/2022	0:00	0.9	135	24/08/2022	0:00	2.2	270
21/08/2022	1:00	1.3	112.5	22/08/2022	1:00	0.4	247.5	23/08/2022	1:00	1.3	135	24/08/2022	1:00	1.8	135
21/08/2022	2:00	0.4	112.5	22/08/2022	2:00	0.9	225	23/08/2022	2:00	0.9	337.5	24/08/2022	2:00	1.8	135
21/08/2022	3:00	0.4	112.5	22/08/2022	3:00	0.4	225	23/08/2022	3:00	0.9	292.5	24/08/2022	3:00	0.9	225
21/08/2022	4:00	0.4	135	22/08/2022	4:00	0.9	247.5	23/08/2022	4:00	0.9	292.5	24/08/2022	4:00	0.4	225
21/08/2022	5:00	0.9	112.5	22/08/2022	5:00	0.9	247.5	23/08/2022	5:00	1.3	270	24/08/2022	5:00	0.4	270
21/08/2022	6:00	0.9	90	22/08/2022	6:00	0.4	225	23/08/2022	6:00	0.9	270	24/08/2022	6:00	0.9	225
21/08/2022	7:00	0.9	135	22/08/2022	7:00	0.4	225	23/08/2022	7:00	1.8	292.5	24/08/2022	7:00	0.9	247.5
21/08/2022	8:00	1.3	112.5	22/08/2022	8:00	0.4	292.5	23/08/2022	8:00	1.8	247.5	24/08/2022	8:00	0.9	247.5
21/08/2022	9:00	1.3	112.5	22/08/2022	9:00	0.4	112.5	23/08/2022	9:00	0.4	247.5	24/08/2022	9:00	0.9	247.5
21/08/2022	10:00	0.9	112.5	22/08/2022	10:00	0.4	135	23/08/2022	10:00	0.4	247.5	24/08/2022	10:00	0.9	225
21/08/2022	11:00	1.3	112.5	22/08/2022	11:00	0.9	135	23/08/2022	11:00	0.4	202.5	24/08/2022	11:00	0.9	225
21/08/2022	12:00	0.9	67.5	22/08/2022	12:00	0.9	247.5	23/08/2022	12:00	1.3	247.5	24/08/2022	12:00	1.3	247.5
21/08/2022	13:00	0.9	90	22/08/2022	13:00	0.9	270	23/08/2022	13:00	0.9	247.5	24/08/2022	13:00	1.8	247.5
21/08/2022	14:00	1.3	135	22/08/2022	14:00	0.9	292.5	23/08/2022	14:00	0.9	247.5	24/08/2022	14:00	1.8	247.5
21/08/2022	15:00	0.4	135	22/08/2022	15:00	0.4	292.5	23/08/2022	15:00	0.4	270	24/08/2022	15:00	1.3	247.5
21/08/2022	16:00	0.4	135	22/08/2022	16:00	1.8	292.5	23/08/2022	16:00	0.4	157.5	24/08/2022	16:00	1.3	225
21/08/2022	17:00	0.9	135	22/08/2022	17:00	2.2	225	23/08/2022	17:00	0.9	90	24/08/2022	17:00	1.3	247.5
21/08/2022	18:00	0.4	135	22/08/2022	18:00	2.2	270	23/08/2022	18:00	0.9	270	24/08/2022	18:00	1.3	112.5
21/08/2022	19:00	0.9	135	22/08/2022	19:00	1.8	90	23/08/2022	19:00	0.4	270	24/08/2022	19:00	1.3	112.5
21/08/2022	20:00	0.4	135	22/08/2022	20:00	1.3	112.5	23/08/2022	20:00	0.9	247.5	24/08/2022	20:00	1.3	112.5
21/08/2022	21:00	0.4	135	22/08/2022	21:00	0.9	292.5	23/08/2022	21:00	0.4	270	24/08/2022	21:00	0.9	337.5
21/08/2022	22:00	0.4	247.5	22/08/2022	22:00	0.4	270	23/08/2022	22:00	1.3	157.5	24/08/2022	22:00	0.4	22.5
21/08/2022	23:00	0.4	202.5	22/08/2022	23:00	0.4	270	23/08/2022	23:00	0.9	67.5	24/08/2022	23:00	0.4	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
25/08/2022	0:00	0.4	112.5	26/08/2022	0:00	1.3	135	27/08/2022	0:00	2.2	112.5	28/08/2022	0:00	0.9	112.5
25/08/2022	1:00	0.4	135	26/08/2022	1:00	0.4	135	27/08/2022	1:00	1.3	247.5	28/08/2022	1:00	1.3	67.5
25/08/2022	2:00	1.8	112.5	26/08/2022	2:00	0.9	135	27/08/2022	2:00	1.8	225	28/08/2022	2:00	0.9	292.5
25/08/2022	3:00	1.8	112.5	26/08/2022	3:00	0.9	90	27/08/2022	3:00	2.2	202.5	28/08/2022	3:00	0.9	112.5
25/08/2022	4:00	1.3	225	26/08/2022	4:00	0.4	90	27/08/2022	4:00	2.2	90	28/08/2022	4:00	0.9	135
25/08/2022	5:00	1.8	247.5	26/08/2022	5:00	0.4	22.5	27/08/2022	5:00	1.8	22.5	28/08/2022	5:00	0.9	112.5
25/08/2022	6:00	2.2	247.5	26/08/2022	6:00	0.4	247.5	27/08/2022	6:00	1.8	90	28/08/2022	6:00	0.9	135
25/08/2022	7:00	2.2	225	26/08/2022	7:00	0.9	270	27/08/2022	7:00	2.2	225	28/08/2022	7:00	0.9	112.5
25/08/2022	8:00	2.2	247.5	26/08/2022	8:00	0.9	67.5	27/08/2022	8:00	2.2	247.5	28/08/2022	8:00	0.9	90
25/08/2022	9:00	2.2	270	26/08/2022	9:00	0.9	225	27/08/2022	9:00	2.2	247.5	28/08/2022	9:00	0.4	135
25/08/2022	10:00	2.2	157.5	26/08/2022	10:00	0.9	225	27/08/2022	10:00	1.8	112.5	28/08/2022	10:00	0.4	90
25/08/2022	11:00	1.8	225	26/08/2022	11:00	0.9	225	27/08/2022	11:00	1.8	45	28/08/2022	11:00	0.9	135
25/08/2022	12:00	2.2	225	26/08/2022	12:00	0.9	202.5	27/08/2022	12:00	0.9	90	28/08/2022	12:00	0.9	90
25/08/2022	13:00	1.8	22.5	26/08/2022	13:00	0.4	270	27/08/2022	13:00	0.9	202.5	28/08/2022	13:00	0.4	135
25/08/2022	14:00	1.3	225	26/08/2022	14:00	0.4	247.5	27/08/2022	14:00	0.4	225	28/08/2022	14:00	0.9	90
25/08/2022	15:00	2.2	225	26/08/2022	15:00	0.4	225	27/08/2022	15:00	0.9	247.5	28/08/2022	15:00	0.9	90
25/08/2022	16:00	1.8	225	26/08/2022	16:00	0.4	225	27/08/2022	16:00	0.9	270	28/08/2022	16:00	0.9	292.5
25/08/2022	17:00	2.2	247.5	26/08/2022	17:00	0.9	247.5	27/08/2022	17:00	1.3	292.5	28/08/2022	17:00	0.9	112.5
25/08/2022	18:00	1.8	225	26/08/2022	18:00	0.4	225	27/08/2022	18:00	0.9	270	28/08/2022	18:00	0.9	112.5
25/08/2022	19:00	1.3	225	26/08/2022	19:00	0.9	225	27/08/2022	19:00	0.4	247.5	28/08/2022	19:00	0.9	112.5
25/08/2022	20:00	1.3	135	26/08/2022	20:00	0.9	247.5	27/08/2022	20:00	0.9	112.5	28/08/2022	20:00	0.9	112.5
25/08/2022	21:00	1.3	225	26/08/2022	21:00	0.9	225	27/08/2022	21:00	0.9	112.5	28/08/2022	21:00	0.9	112.5
25/08/2022	22:00	1.3	225	26/08/2022	22:00	1.8	247.5	27/08/2022	22:00	0.4	247.5	28/08/2022	22:00	0.9	135
25/08/2022	23:00	0.4	247.5	26/08/2022	23:00	1.3	247.5	27/08/2022	23:00	0.9	247.5	28/08/2022	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
29/08/2022	0:00	2.2	247.5	30/08/2022	0:00	0.9	90	31/08/2022	0:00	0.4	270				
29/08/2022	1:00	1.3	247.5	30/08/2022	1:00	0.9	90	31/08/2022	1:00	0.9	270				
29/08/2022	2:00	1.8	270	30/08/2022	2:00	0.4	135	31/08/2022	2:00	0.4	112.5				
29/08/2022	3:00	1.8	270	30/08/2022	3:00	0.4	112.5	31/08/2022	3:00	0.4	247.5				
29/08/2022	4:00	1.3	270	30/08/2022	4:00	0.4	112.5	31/08/2022	4:00	0.9	225				
29/08/2022	5:00	0.9	247.5	30/08/2022	5:00	1.3	90	31/08/2022	5:00	0.4	247.5				
29/08/2022	6:00	0.9	337.5	30/08/2022	6:00	1.3	135	31/08/2022	6:00	0.4	247.5				
29/08/2022	7:00	0.4	225	30/08/2022	7:00	0.9	112.5	31/08/2022	7:00	0.4	112.5				
29/08/2022	8:00	0.4	270	30/08/2022	8:00	1.3	112.5	31/08/2022	8:00	0.9	112.5				
29/08/2022	9:00	0.9	225	30/08/2022	9:00	1.3	112.5	31/08/2022	9:00	0.9	135				
29/08/2022	10:00	0.4	247.5	30/08/2022	10:00	1.3	90	31/08/2022	10:00	0.9	112.5				
29/08/2022	11:00	0.4	225	30/08/2022	11:00	1.3	90	31/08/2022	11:00	0.9	112.5				
29/08/2022	12:00	0.9	247.5	30/08/2022	12:00	0.9	90	31/08/2022	12:00	0.9	112.5				
29/08/2022	13:00	0.9	225	30/08/2022	13:00	0.9	135	31/08/2022	13:00	0.9	112.5				
29/08/2022	14:00	0.9	90	30/08/2022	14:00	0.9	135	31/08/2022	14:00	0.9	112.5				
29/08/2022	15:00	0.4	112.5	30/08/2022	15:00	0.9	22.5	31/08/2022	15:00	0.9	112.5				
29/08/2022	16:00	0.9	225	30/08/2022	16:00	0.4	157.5	31/08/2022	16:00	0.9	112.5				
29/08/2022	17:00	0.9	247.5	30/08/2022	17:00	0.4	67.5	31/08/2022	17:00	0.4	112.5				
29/08/2022	18:00	0.9	112.5	30/08/2022	18:00	1.3	112.5	31/08/2022	18:00	0.9	135				
29/08/2022	19:00	0.4	67.5	30/08/2022	19:00	1.3	112.5	31/08/2022	19:00	1.3	112.5				
29/08/2022	20:00	0.9	202.5	30/08/2022	20:00	1.3	90	31/08/2022	20:00	1.3	135				
29/08/2022	21:00	0.4	270	30/08/2022	21:00	1.8	90	31/08/2022	21:00	1.3	135				
29/08/2022	22:00	0.4	112.5	30/08/2022	22:00	0.9	135	31/08/2022	22:00	1.3	135				
29/08/2022	23:00	0.4	90	30/08/2022	23:00	0.4	45	31/08/2022	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			
02/08/2022	Sunny	35.8	1007.1	18.1004	18.1902	0.0898	2022/8/2 9:11	2022/8/3 9:11	1440	50	50	1.31	1891	47
08/08/2022	Cloudy	25.8	1006.3	18.0228	18.0926	0.0698	2022/8/8 13:30	2022/8/9 13:30	1440	50	50	1.34	1923	36
13/08/2022	Sunny	30.8	1008	14.7346	14.7969	0.0623	2022/8/13 13:14	2022/8/14 13:14	1440	50	50	1.33	1908	33
19/08/2022	Cloudy	27.7	1004.9	17.7123	17.785	0.0727	2022/8/19 9:18	2022/8/20 9:18	1440	50	50	1.33	1915	38
25/08/2022	Cloudy	30.0	1006.3	14.7855	14.8867	0.1012	2022/8/25 11:17	2022/8/26 11:17	1440	46	46	1.22	1752	58
31/08/2022	Cloudy	33.3	1006.7	17.8203	17.8549	0.0346	2022/8/31 9:25	2022/9/1 9:25	1440	46	46	1.20	1728	20
													Maximum	58
													Minimum	20
													Average	39
													Action Level	182
													Limit Level	260



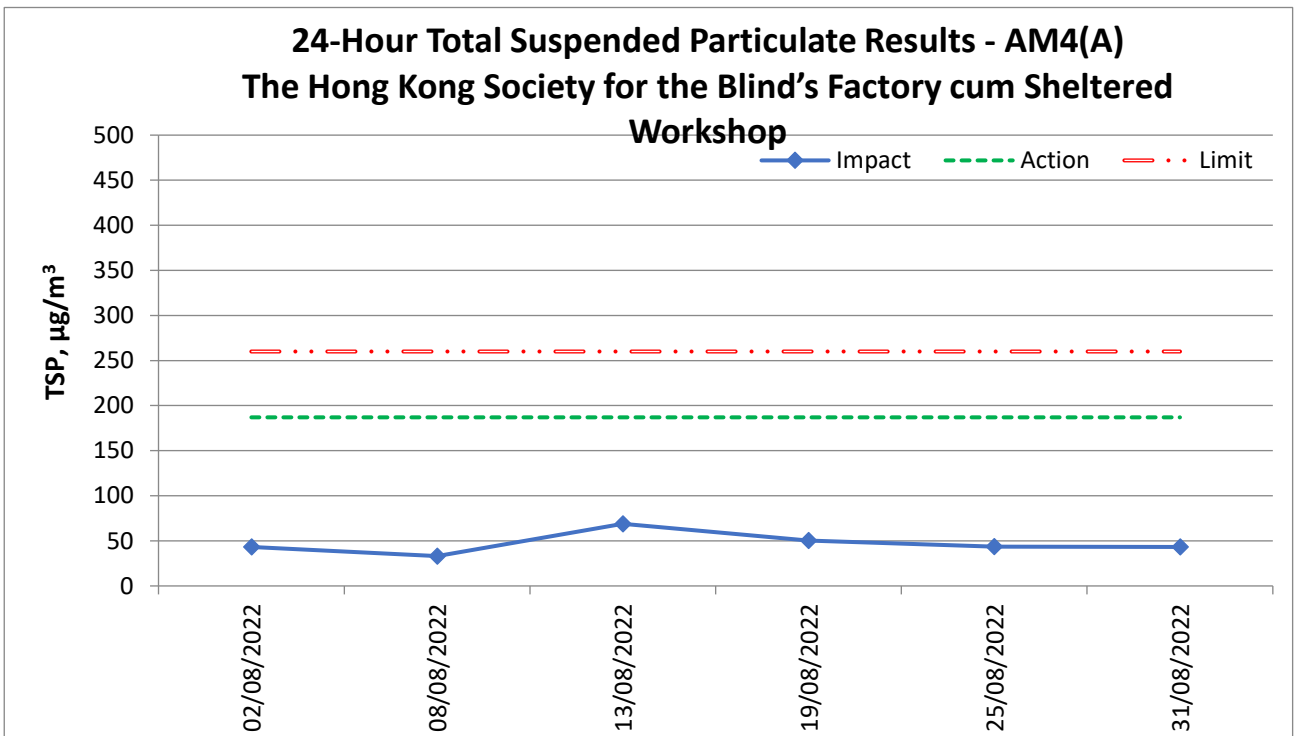
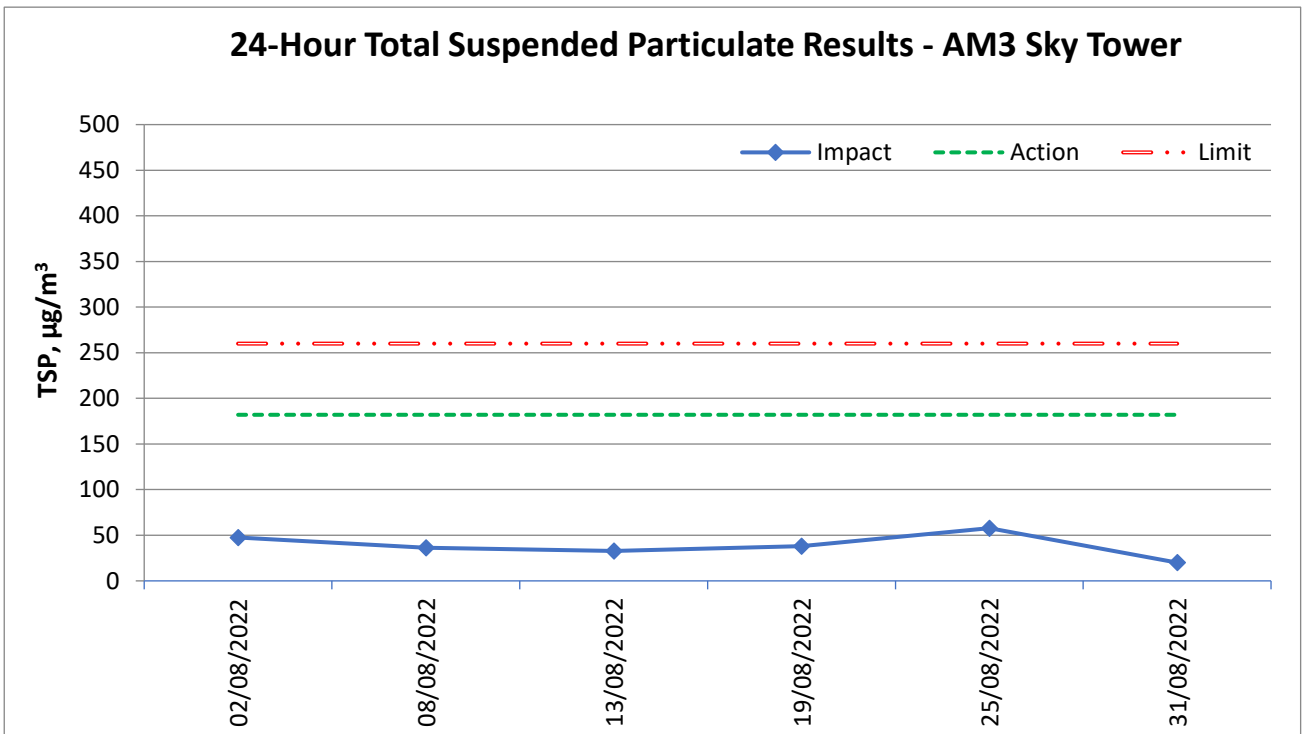
Location: AM4(A) – The Hong Kong Society for the Blind’s Factory cum Sheltered Workshop

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			
02/08/2022	Sunny	35.8	1007.1	18.8657	18.9419	0.0762	4208.86	4232.87	1441	46	46	1.23	1768	43
08/08/2022	Cloudy	25.8	1006.3	17.8932	17.9527	0.0595	4233.65	4257.67	1441	46	46	1.25	1798	33
13/08/2022	Sunny	30.8	1008	17.8683	17.9912	0.1229	4257.85	4281.86	1441	46	46	1.24	1784	69
19/08/2022	Cloudy	27.7	1004.9	18.2324	18.3225	0.0901	4282.65	4306.67	1441	46	46	1.24	1791	50
25/08/2022	Cloudy	30.0	1006.3	18.0483	18.1263	0.078	4307.61	4331.62	1441	46	46	1.24	1785	44
31/08/2022	Cloudy	33.3	1006.7	18.0939	18.1704	0.0765	4332.24	4356.25	1441	46	46	1.23	1774	43
													Maximum	69
													Minimum	33
													Average	47
													Action Level	187
													Limit Level	260

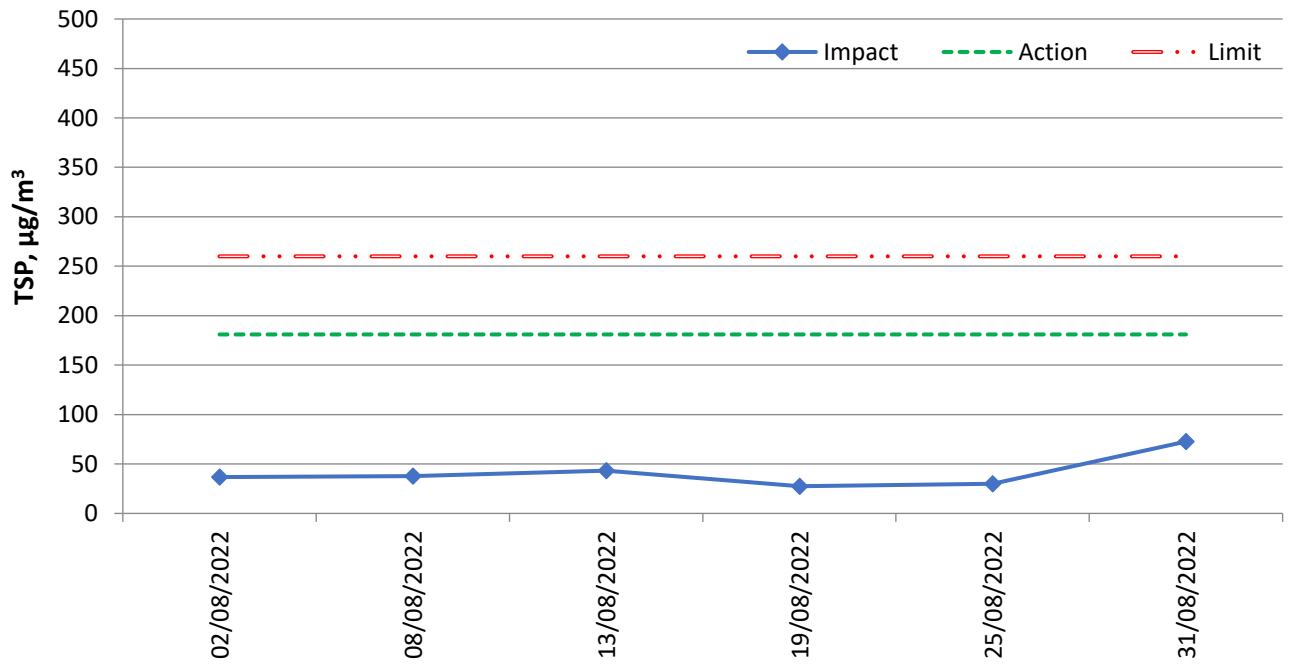
Location: AM7 – Hong Kong Children’s Hospital

Start Date	Weather	Air Temp. (°C)	Atmospheric Pressure (hPa)	Filter weight (g)		Particulate weight (g)	Elapse Time		Sampling Time (min)	Flow Rate (cfm)		Av. Flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
				Initial	Final		Initial	Final		Initial	Final			
02/08/2022	Sunny	35.8	1007.1	17.9824	18.0559	0.0735	9382.39	9406.41	1441	50	50	1.39	2005	37
08/08/2022	Cloudy	25.8	1006.3	18.0377	18.1149	0.0772	9406.91	9430.93	1441	50	50	1.41	2038	38
13/08/2022	Sunny	30.8	1008	17.8032	17.8908	0.0876	9431.09	9455.11	1441	50	50	1.40	2022	43
19/08/2022	Cloudy	27.7	1004.9	14.9254	14.9813	0.0559	9455.65	9479.67	1441	50	50	1.41	2030	28
25/08/2022	Cloudy	30.0	1006.3	15.1184	15.1817	0.0633	9480.72	9504.73	1441	52	52	1.46	2104	30
31/08/2022	Cloudy	33.3	1006.7	14.9513	15.0986	0.1473	9505.21	9529.23	1441	52	52	1.41	2027	73
													Maximum	73
													Minimum	28
													Average	41
													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, μg/m <sup>3</sup>	Weather
02/08/2022	9:00	-	10:00	35	Sunny
	10:00	-	11:00	37	
	11:00	-	12:00	38	
08/08/2022	13:00	-	14:00	32	Cloudy
	14:00	-	15:00	36	
	15:00	-	16:00	36	
13/08/2022	13:00	-	14:00	30	Sunny
	14:00	-	15:00	33	
	15:00	-	16:00	37	
19/08/2022	9:00	-	10:00	36	Cloudy
	10:00	-	11:00	36	
	11:00	-	12:00	40	
25/08/2022	11:00	-	12:00	50	Cloudy
	13:00	-	14:00	53	
	14:00	-	15:00	55	
31/08/2022	9:00	-	10:00	31	Cloudy
	10:00	-	11:00	33	
	11:00	-	12:00	30	
Maximum				55	
Minimum				30	
Average				38	
Action Level				297	
Limit Level				500	

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

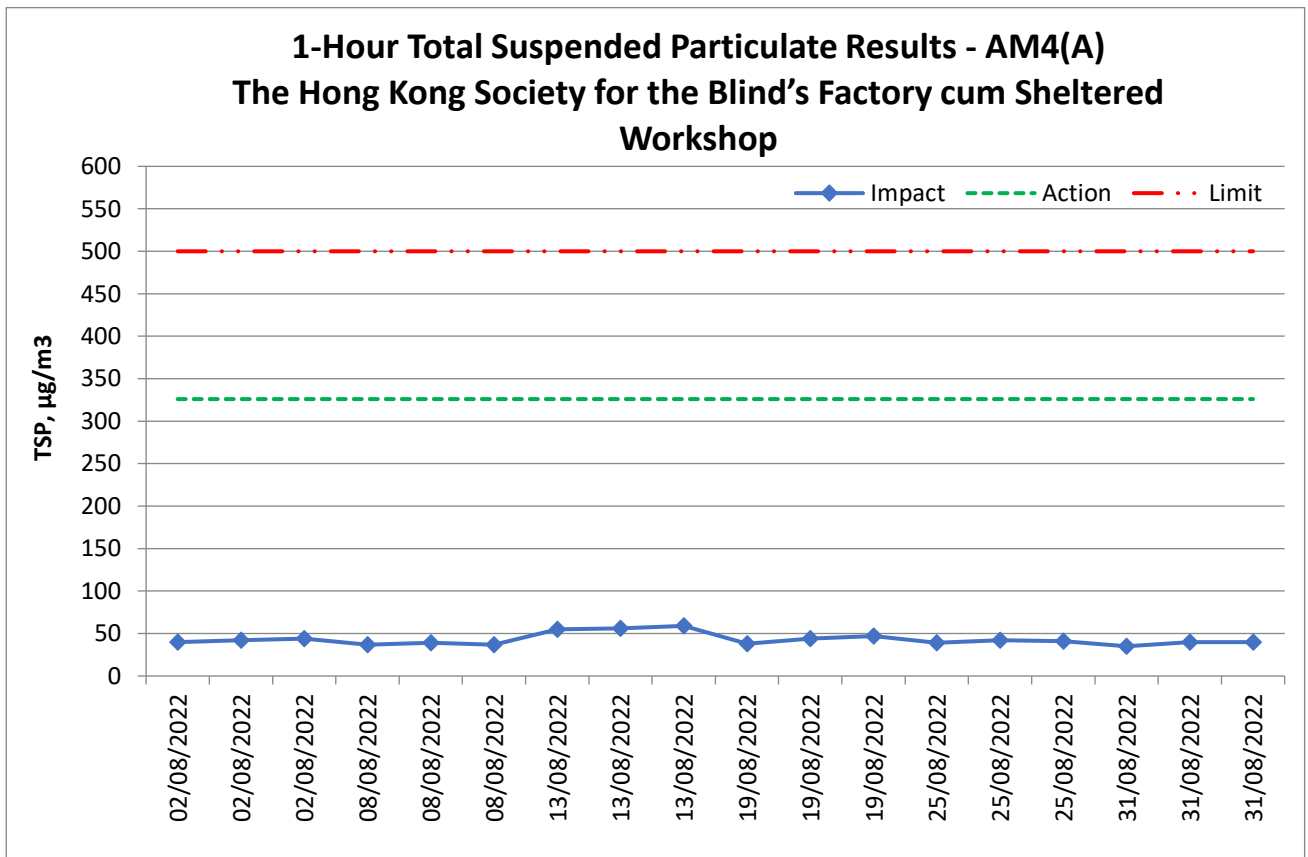
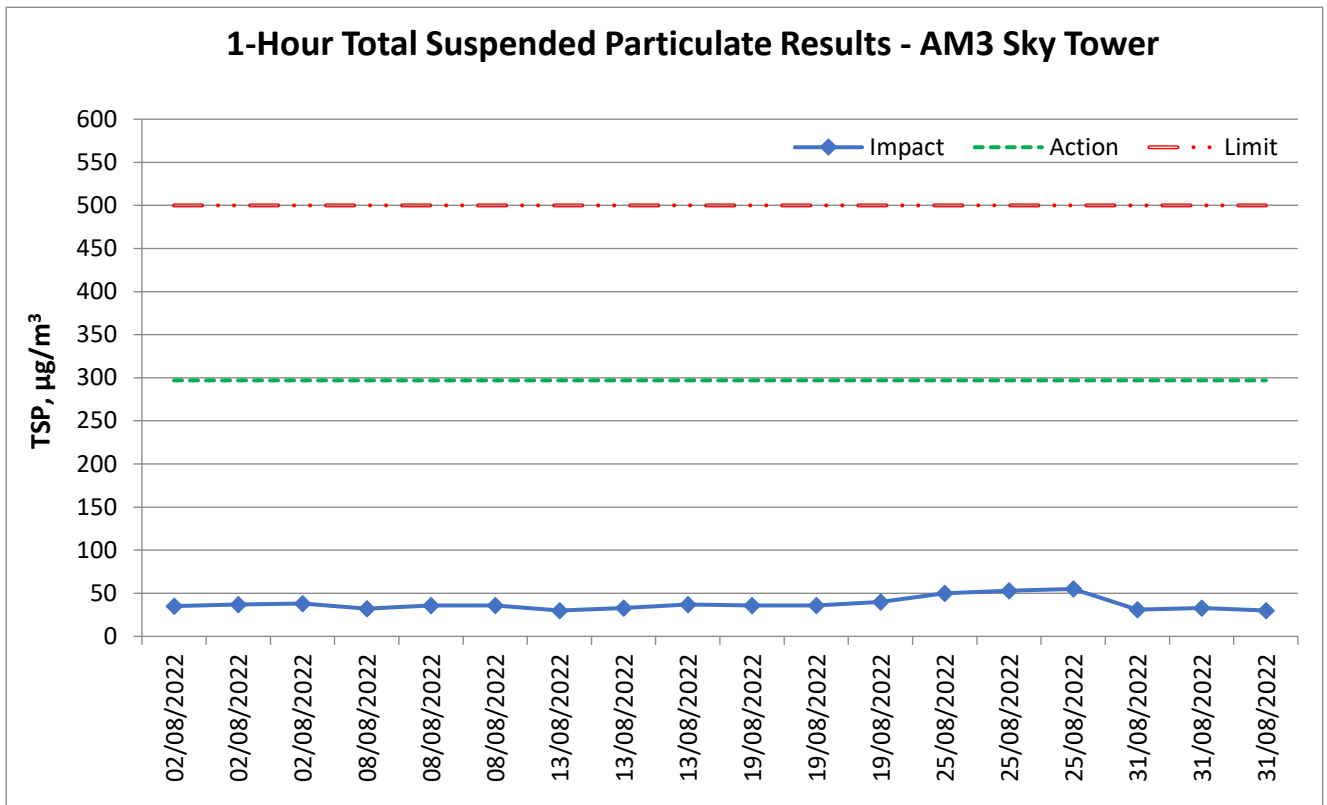
Date	Measurement Period			1-hr TSP concentration, µg/m <sup>3</sup>	Weather
		-			
02/08/2022	9:00	-	10:00	40	Sunny
	10:00	-	11:00	42	
	11:00	-	12:00	44	
08/08/2022	13:00	-	14:00	37	Cloudy
	14:00	-	15:00	39	
	15:00	-	16:00	37	
13/08/2022	9:00	-	10:00	55	Sunny
	10:00	-	11:00	56	
	11:00	-	12:00	59	
19/08/2022	9:00	-	10:00	38	Cloudy
	10:00	-	11:00	44	
	11:00	-	12:00	47	
25/08/2022	13:00	-	14:00	39	Cloudy
	14:00	-	15:00	42	
	15:00	-	16:00	41	
31/08/2022	13:00	-	14:00	35	Cloudy
	14:00	-	15:00	40	
	15:00	-	16:00	40	
Maximum				59	
Minimum				35	
Average				43	
Action Level				326	
Limit Level				500	

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

**Kong**

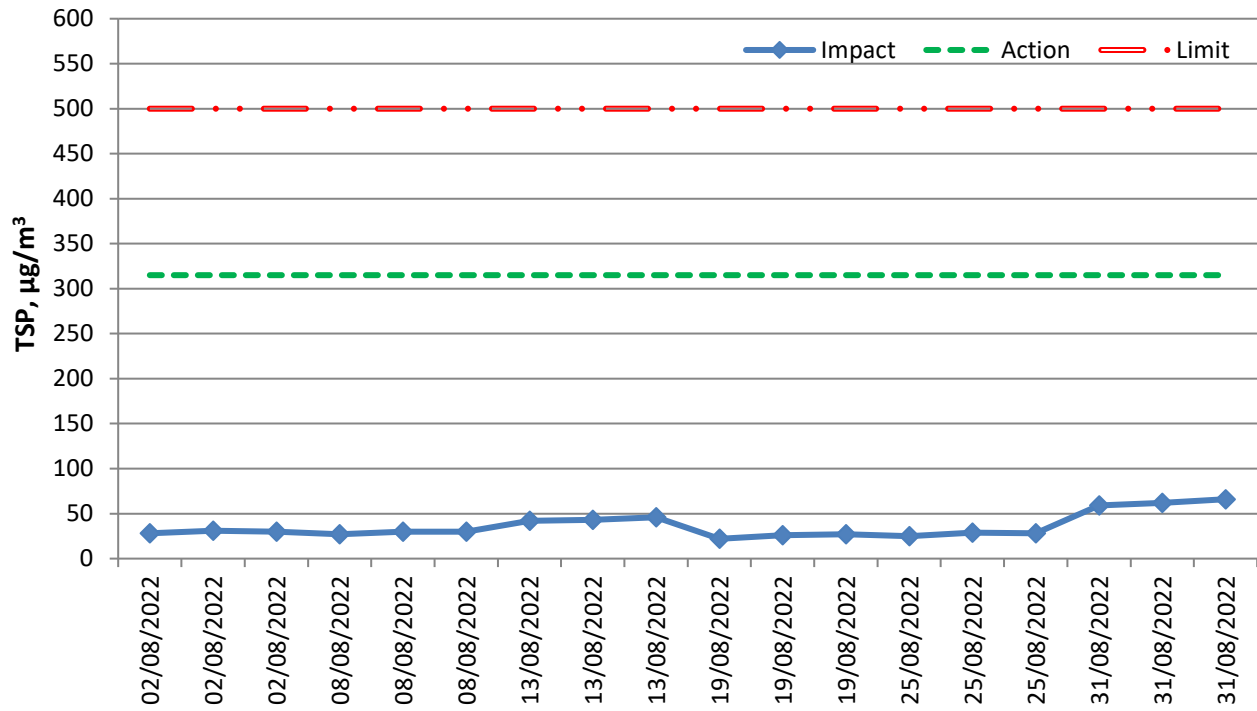
Date	Measurement Period			1-hr TSP concentration, $\mu\text{g}/\text{m}^3$	Weather
02/08/2022	13:00	-	14:00	28	Sunny
	14:00	-	15:00	31	
	15:00	-	16:00	30	
08/08/2022	9:00	-	10:00	27	Cloudy
	10:00	-	11:00	30	
	11:00	-	12:00	30	
13/08/2022	13:00	-	14:00	42	Sunny
	14:00	-	15:00	43	
	15:00	-	16:00	46	
19/08/2022	13:00	-	14:00	22	Cloudy
	14:00	-	15:00	26	
	15:00	-	16:00	27	
25/08/2022	11:00	-	12:00	25	Cloudy
	16:00	-	17:00	29	
	17:00	-	18:00	28	
31/08/2022	9:00	-	10:00	59	Cloudy
	10:00	-	11:00	62	
	11:00	-	12:00	66	
Maximum				66	
Minimum				22	
Average				36	
Action Level				315	
Limit Level				500	

**1-hour average TSP**





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



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

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

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

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

# Catalogue of Sound Level Meter

## Specifications

	NL-52	NL-42
Applicable standards	IEC 61672-1: 2002 Class 1 ANSI S1.4-1983 Type 1 ANSI S1.4A-1985 Type 1 ANSI S1.43-1997 Type 1 JIS C 1509-1: 2005 Class 1	IEC 61672-1: 2002 Class 2 ANSI S1.4-1983 Type 2 ANSI S1.4A-1985 Type 2 ANSI S1.43-1997 Type 2 JIS C 1509-1: 2005 Class 2
Measurement functions	Simultaneous measurement of the following items, with selected time weighting and frequency weighting WEEE Directives, Chinese RoHS (export model for China only)	
Processing (main ch)	Instantaneous sound pressure level: $L_p$ Equivalent continuous sound pressure level: $L_{eq}$ Sound exposure level: $L_E$ Maximum sound pressure level: $L_{max}$ Minimum sound pressure level: $L_{min}$ Percentage sound levels: $L_N$ (0.1 to 99.9 %, 0.1-increment steps, max. 5 values)	
Processing (sub ch)	Instantaneous sound pressure level: $L_p$	
Additional processing	In addition to main processing items, one of the following can be selected for simultaneous processing: C-weighted equivalent continuous sound level: $L_{Ceq}$ C-weighted peak sound level: $L_{Cpeak}$ Z-weighted peak sound level: $L_{Zpeak}$ 1-time-weighted equivalent continuous sound level: $L_{A1eq}^{*2}$ Maximum 1-time-weighted equivalent continuous sound level: $L_{A1max}^{*2}$ The power average of the maximum level of each 5 second interval: $L_{A1a5}$ The frequency weighting for the additional processing synchronizes with the frequency weighting of the sub-channel, so when the sub-channel has A-weighting, $L_{A1a5}$ can be selected. When C-weighting (Z-weighting) is selected, the additional processing $L_{Ceq}$ and $L_{Cpeak}$ ( $L_{Zpeak}$ ) are selectable.	
Measuring time	10 s, 1, 5, 10, 15, 30 m, 1, 8, 24 h, and manual (maximum 24 h)	
Microphone	Type UC-59 UC-52 Sensitivity level -27 dB -33 dB	
Measurement range	A-weighting: 25 dB to 138 dB C-weighting: 33 dB to 138 dB Z-weighting: 38 dB to 138 dB C-weighting peak sound level: 55 dB to 141 dB Z-weighting peak sound level: 60 dB to 141 dB	
Inherent noise	A-weighting 17 dB or less C-weighting 25 dB or less Z-weighting 30 dB or less	19 dB or less 27 dB or less 32 dB or less
Frequency range	20 Hz to 20 kHz	20 Hz to 8 kHz
Frequency weighting	A, C, and Z	
Time weighting	F (Fast) and S (Slow)	
Level range	Single range (Linearity range: 113 dB) Bar graph display range max. Max. 110 dB (20 to 130 dB) Switching of bar graph display Set the upper/lower limit in 10 dB increments.	
RMS detection circuit	Digital processing method	
Sampling cycle	20.8 $\mu$ s ( $L_p$ , $L_{eq}$ , $L_E$ , $L_{max}$ , $L_{min}$ , $L_{peak}$ : sampling frequency: 48 kHz) 100 ms ( $L_N$ )	
Calibration	Measurement Law: electrical calibration performed according to IEC and JIS standards, using internally generated signals; acoustic calibration performed with the NC-74.	
Correction functions	Windscreen correction: Compliant with IEC 61672-1 and JIS C 1509-1 standards when the windscreen is installed. Diffuse sound field correction: Correction of frequency characteristics in order to comply with standards (ANSI S1.4) in diffuse sound field.	
Delay time	The meter can be set to start measuring a specified time (OFF, 1, 3, 5 or 10 s) after the start button has been pressed or when a user-set trigger is exceeded.	
Back erase function	When the PAUSE key is pressed to pause measurement, the preceding (user selectable) 0, 1, 3 or 5 s data are excluded from processing.	
Display	Backlit semitransparent color TFT LCD display WQVGA (400 x 240 dots) * LCD with touch panel (Capacitive Touch Panel) Numerical display update frequency: 1 s * Bar graph update frequency: 100 ms	
Store	Manual Number of data Internal memory: max. 1000 sets SD Card: depends on the capacity of the SD Card *1	Auto *2 Instantaneous values ( $L_p$ mode) and processed values ( $L_{eq}$ mode) are stored continuously and automatically at preset intervals. $L_p$ sampling cycle 100 ms, 200 ms, 1 s, $L_{eq}$ 1 s $L_{eq}$ 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).  
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1011-4 212 P.D

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

## Options

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

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

### Precautions regarding waterproofing

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



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

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

# Calibration Certificate of Sound Level Meter



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

## 校准证书

### CALIBRATION CERTIFICATE

证书编号: 2HB21001749-0004  
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:	00921213	
Serial No.		
管理号:	AAS-TSLM-04	
Asset No.		
接收日期:	2021-08-05	校准日期: 2021-08-16
Rec. Date		Cal. Date
签发日期:	2021-08-17	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: 赵文红  
Calibrated by *赵文红*

签发: 郑木力  
Approved by *郑木力*

核校: 张毅  
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.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

证书编号(Certificate No.): 2HB21001749-0004

## 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 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: ±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
正弦信号发生器	4GC20000427-0010/2021-11-04/赛宝(广州)	f: ±1mHz; 失真度 Distortion: <-70dB U=(0.05~0.20)dB (k=2)	f: 0.001Hz~200kHz; U: 100μV~5Vrms 20Hz~20kHz (10~50000) Hz
标准传声器	LSsx2021-13180/2022-04-24/中国计量院	U=0.3dB (k=2)	频率:0.001Hz~51.2kHz, 电压:(1~10 <sup>-3</sup> ~30)V
前置放大器	LSsx2021-13000/2022-04-19/中国计量院	频率:U <sub>in</sub> =0.001%,k=2;电压:U <sub>in</sub> =0.04%,k=2	94dB,114dB@(1000Hz)
PULSE分析系统	4GC21000026-0375/2022-01-21/赛宝(广州)	频率响应: ±1dB, 失真度: ≤0.2%	20Hz~20kHz
声级校准器	LSsx2021-11345/2022-03-07/中国计量院	±3dB	(0~110) dB/10dB step @ (DC~1GHz)
功率放大器	4GC20000457-0065A/2021-11-17/赛宝(广州)	1级 First Level	31.5Hz~16kHz
步进衰减器	4GC21000155-0024/2022-04-29/赛宝(广州)		
声校准器	4GC20000502-0050/2021-12-21/赛宝(广州)		

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.



# Calibration Certificate of Sound Level Meter



证书编号(Certificate No.): 2HB21001749-0004

**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 (Pre-amplifier Type)	放大器编号 (Pre-amplifier SN.)
UC-59	15359	NH-25	21255

声校准器型号 (Calibrator Type)	标准声压级 (Reference SPL) (dB)	校准前示值 (Before Calibration) (dB)	校准后示值 (After Calibration) (dB)	U (k=2) (dB)
4231	94.0	94.1	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):	-0.1 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):	-0.5 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):	-0.5 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):	-0.4 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):	-0.4 dB
U (k=2)	0.4 dB

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证书编号(Certificate No.): 2HB21001749-0004

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

频率 (Frequency) (Hz)	实测值 (Actual) (dB)	理论值 (Theoretical value) (dB)	误差 (Error) (dB)	允许误差 (Limit) (dB)	结论 (Pass/Fail) (P/F)	U (k=2) (dB)
20	-50.5	-50.5	0.0	±2.0	P	0.5
25	-44.7	-44.7	0.0	+2.0 ~ -1.5	P	0.5
31.5	-39.7	-39.4	-0.3	±1.5	P	0.5
40	-34.5	-34.6	0.1	±1.0	P	0.5
50	-30.2	-30.2	0.0	±1.0	P	0.5
63	-26.1	-26.2	0.1	±1.0	P	0.5
80	-22.4	-22.5	0.1	±1.0	P	0.5
100	-19.1	-19.1	0.0	±1.0	P	0.5
125	-16.0	-16.1	0.1	±1.0	P	0.5
160	-12.9	-13.4	0.5	±1.0	P	0.5
200	-10.7	-10.9	0.2	±1.0	P	0.5
250	-8.5	-8.6	0.1	±1.0	P	0.5
315	-6.6	-6.6	0.0	±1.0	P	0.4
400	-4.6	-4.8	0.2	±1.0	P	0.4
500	-3.1	-3.2	0.1	±1.0	P	0.4
630	-1.8	-1.9	0.1	±1.0	P	0.4
800	-0.7	-0.8	0.1	±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	1.1	1.2	-0.1	±1.0	P	0.6
2500	1.1	1.3	-0.2	±1.0	P	0.6
3150	1.0	1.2	-0.2	±1.0	P	0.6
4000	0.7	1.0	-0.3	±1.0	P	0.6
5000	0.4	0.5	-0.1	±1.5	P	0.6
6300	-0.2	-0.1	-0.1	+1.5 ~ -2.0	P	0.6
8000	-0.9	-1.1	0.2	+1.5 ~ -2.5	P	0.6
10000	-2.3	-2.5	0.2	+2.0 ~ -3.0	P	0.6
12500	-4.3	-4.3	0.0	+2.0 ~ -5.0	P	1.0
16000	-8.5	-6.6	-1.9	+2.5 ~ -16.0	P	1.0
20000	-18.4	-9.3	-9.1	+3.0 ~ ∞	P	1.0

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## Calibration Certificate of Sound Level Meter



证书编号(Certificate No.): 2HB21001749-0004

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

频率 (Frequency) (Hz)	实测值 (Actual) (dB)	理论值 (Theoretical value) (dB)	误差 (Error) (dB)	允许误差 (Limit) (dB)	结论 (Pass/Fail) (P/F)	U (k=2) (dB)
20	-6.3	-6.2	-0.1	±2.0	P	0.5
25	-4.6	-4.4	-0.2	+2.0 ~ -1.5	P	0.5
31.5	-3.1	-3.0	-0.1	±1.5	P	0.5
40	-2.0	-2.0	0.0	±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	0.0	-0.1	0.1	±1.0	P	0.5
200	0.0	0.0	0.0	±1.0	P	0.5
250	0.1	0.0	0.1	±1.0	P	0.5
315	0.1	0.0	0.1	±1.0	P	0.4
400	0.1	0.0	0.1	±1.0	P	0.4
500	0.1	0.0	0.1	±1.0	P	0.4
630	0.1	0.0	0.1	±1.0	P	0.4
800	0.1	0.0	0.1	±1.0	P	0.4
1000(Ref.)	0.0	0.0	0.0	±0.7	P	0.4
1250	-0.1	0.0	-0.1	±1.0	P	0.6
1600	-0.2	-0.1	-0.1	±1.0	P	0.6
2000	-0.3	-0.2	-0.1	±1.0	P	0.6
2500	-0.5	-0.3	-0.2	±1.0	P	0.6
3150	-0.7	-0.5	-0.2	±1.0	P	0.6
4000	-1.1	-0.8	-0.3	±1.0	P	0.6
5000	-1.5	-1.3	-0.2	±1.5	P	0.6
6300	-2.1	-2.0	-0.1	+1.5 ~ -2.0	P	0.6
8000	-3.0	-3.0	0.0	+1.5 ~ -2.5	P	0.6
10000	-4.2	-4.4	0.2	+2.0 ~ -3.0	P	0.6
12500	-6.2	-6.2	0.0	+2.0 ~ -5.0	P	1.0
16000	-10.4	-8.5	-1.9	+2.5 ~ -16.0	P	1.0
20000	-20.4	-11.2	-9.2	+3.0 ~ -∞	P	1.0

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证书编号(Certificate No.): 2HB21001749-0004

### 6 自生噪声 (Autogenous noise)

计权 (Weighting)	实测值 (Actual) (dB)
A	18.1

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# Calibration Certificate of Sound Level Meter



证书编号(Certificate No.): 2HB22001076-0002

**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.)
/	/	/	/

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	93.8	93.8	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.): 2HB22001076-0002

**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	-50.6	-50.5	-0.1	±2.0	P	0.5
25	-44.9	-44.7	-0.2	+2.0 ~ -1.5	P	0.5
31.5	-39.7	-39.4	-0.3	±1.5	P	0.5
40	-34.6	-34.6	0.0	±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	-16.1	-16.1	0.0	±1.0	P	0.5
160	-13.3	-13.4	0.1	±1.0	P	0.5
200	-10.8	-10.9	0.1	±1.0	P	0.5
250	-8.6	-8.6	0.0	±1.0	P	0.5
315	-6.6	-6.6	0.0	±1.0	P	0.4
400	-4.7	-4.8	0.1	±1.0	P	0.4
500	-3.2	-3.2	0.0	±1.0	P	0.4
630	-1.9	-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	1.0	1.2	-0.2	±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	0.7	1.0	-0.3	±1.0	P	0.6
5000	0.4	0.5	-0.1	±1.5	P	0.6
6300	-0.3	-0.1	-0.2	+1.5 ~ -2.0	P	0.6
8000	-1.1	-1.1	0.0	+1.5 ~ -2.5	P	0.6
10000	-2.3	-2.5	0.2	+2.0 ~ -3.0	P	0.6
12500	-4.3	-4.3	0.0	+2.0 ~ -5.0	P	1.0
16000	-8.6	-6.6	-2.0	+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.): 2HB22001076-0002

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)
(Hz)	(dB)	(dB)	(dB)	(dB)	(P/F)	(dB)
20	-6.4	-6.2	-0.2	±2.0	P	0.5
25	-4.5	-4.4	-0.1	+2.0 ~ -1.5	P	0.5
31.5	-3.0	-3.0	0.0	±1.5	P	0.5
40	-2.1	-2.0	-0.1	±1.0	P	0.5
50	-1.3	-1.3	0.0	±1.0	P	0.5
63	-0.8	-0.8	0.0	±1.0	P	0.5
80	-0.4	-0.5	0.1	±1.0	P	0.5
100	-0.3	-0.3	0.0	±1.0	P	0.5
125	-0.1	-0.2	0.1	±1.0	P	0.5
160	0.0	-0.1	0.1	±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	-0.1	0.0	-0.1	±1.0	P	0.6
1600	-0.2	-0.1	-0.1	±1.0	P	0.6
2000	-0.5	-0.2	-0.3	±1.0	P	0.6
2500	-0.5	-0.3	-0.2	±1.0	P	0.6
3150	-0.8	-0.5	-0.3	±1.0	P	0.6
4000	-1.1	-0.8	-0.3	±1.0	P	0.6
5000	-1.5	-1.3	-0.2	±1.5	P	0.6
6300	-2.1	-2.0	-0.1	+1.5 ~ -2.0	P	0.6
8000	-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	-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.): 2HB22001076-0002

6 自生噪声 (Autogenous noise)

计权 (Weighting)	实测值 (Actual)
(dB)	(dB)
A	18.8

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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: 2HB22001076-0003  
Certificate No.



委托单位: Client	Castco Testing Centre Limited	
仪器名称: Description	Sound Level Meter	
型号规格: Model/Type	NL-52	
制造商: Manufacturer	RION	
机身号: Serial No.	00976204	
管理号: Asset No.	AAST-SLM-11	
接收日期: Rec. Date	2022-07-21	校准日期: Cal. Date
签发日期: App. Date	2022-08-04	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

核校:  
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

证书编号(Certificate No.): 2HB22001076-0003

## 说明 DIRECTIONS

- 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.
- 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.)
- 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)
步进衰减器	4GC22000181-0032/2023-04-18/赛宝(广州)	±3dB	(0~110) dB/10dB step @ (DC~1GHz)
声校准器	4GC21000573-0101/2022-12-07/赛宝(广州)	1级 First Level	31.5Hz~16kHz
PULSE分析系统	4GC22000014-0140/2023-01-15/赛宝(广州)	频率: $U_{100}=0.001\%$ , $k=2$ ; 电压: $U_{100}=0.04\%$ , $k=2$	频率: 0.001Hz~51.2kHz, 电压: $(1 \times 10^{-3} \sim 30)V$
数字多用表	4GC21000526-0026/2022-11-30/赛宝(广州)	DCV: $\pm 0.0035\%$ ; ACV: $\pm 0.06\%$ ; DCI: $\pm 0.05\%$ ; ACI: $\pm 0.01\%$ ; 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: E3Hz~300kHz
正弦信号发生器	4GC21000496-0024/2022-11-01/赛宝(广州)	f: $\pm 1$ mHz; 失真度 Distortion: $< -70$ dB	f: 0.001Hz~200kHz; U: 100 $\mu$ V~5Vrms
标准传声器	GFJGL1001220311961/2023-03-27/航空304所	$U=(0.05-0.20)$ dB ( $k=2$ )	10Hz~20kHz
前置放大器	GFJGL1001220311960/2023-03-27/航空304所	$U=0.3$ dB ( $k=2$ )	(10~50000) Hz
- 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
- 环境条件(Environmental conditions):  
温度(Temperature): 23.2 $^{\circ}$ C 相对湿度(Relative Humidity): 58%
- 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%.
- 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.
- 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.): 2HB22001076-0003

**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.)
/	/	/	/

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	93.8	93.8	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.): 2HB22001076-0003

**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	-50.5	-50.5	0.0	±2.0	P	0.5
25	-44.9	-44.7	-0.2	+2.0 ~ -1.5	P	0.5
31.5	-39.7	-39.4	-0.3	±1.5	P	0.5
40	-34.5	-34.6	0.1	±1.0	P	0.5
50	-30.3	-30.2	-0.1	±1.0	P	0.5
63	-26.2	-26.2	0.0	±1.0	P	0.5
80	-22.3	-22.5	0.2	±1.0	P	0.5
100	-19.1	-19.1	0.0	±1.0	P	0.5
125	-16.1	-16.1	0.0	±1.0	P	0.5
160	-13.2	-13.4	0.2	±1.0	P	0.5
200	-10.8	-10.9	0.1	±1.0	P	0.5
250	-8.6	-8.6	0.0	±1.0	P	0.5
315	-6.6	-6.6	0.0	±1.0	P	0.4
400	-4.7	-4.8	0.1	±1.0	P	0.4
500	-3.2	-3.2	0.0	±1.0	P	0.4
630	-1.9	-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	1.0	1.2	-0.2	±1.0	P	0.6
2500	1.1	1.3	-0.2	±1.0	P	0.6
3150	0.9	1.2	-0.3	±1.0	P	0.6
4000	0.7	1.0	-0.3	±1.0	P	0.6
5000	0.3	0.5	-0.2	±1.5	P	0.6
6300	-0.2	-0.1	-0.1	+1.5 ~ -2.0	P	0.6
8000	-1.1	-1.1	0.0	+1.5 ~ -2.5	P	0.6
10000	-2.3	-2.5	0.2	+2.0 ~ -3.0	P	0.6
12500	-4.3	-4.3	0.0	+2.0 ~ -5.0	P	1.0
16000	-8.5	-6.6	-1.9	+2.5 ~ -16.0	P	1.0
20000	-18.5	-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.): 2HB22001076-0003

### 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)
(Hz)	(dB)	(dB)	(dB)	(dB)	(P/F)	(dB)
20	-6.6	-6.2	-0.4	±2.0	P	0.5
25	-4.7	-4.4	-0.3	+2.0 ~ -1.5	P	0.5
31.5	-3.0	-3.0	0.0	±1.5	P	0.5
40	-2.0	-2.0	0.0	±1.0	P	0.5
50	-1.3	-1.3	0.0	±1.0	P	0.5
63	-0.8	-0.8	0.0	±1.0	P	0.5
80	-0.4	-0.5	0.1	±1.0	P	0.5
100	-0.2	-0.3	0.1	±1.0	P	0.5
125	-0.1	-0.2	0.1	±1.0	P	0.5
160	0.0	-0.1	0.1	±1.0	P	0.5
200	0.0	0.0	0.0	±1.0	P	0.5
250	0.0	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	-0.1	0.0	-0.1	±1.0	P	0.6
1600	-0.2	-0.1	-0.1	±1.0	P	0.6
2000	-0.3	-0.2	-0.1	±1.0	P	0.6
2500	-0.5	-0.3	-0.2	±1.0	P	0.6
3150	-0.8	-0.5	-0.3	±1.0	P	0.6
4000	-1.1	-0.8	-0.3	±1.0	P	0.6
5000	-1.5	-1.3	-0.2	±1.5	P	0.6
6300	-2.1	-2.0	-0.1	+1.5 ~ -2.0	P	0.6
8000	-3.0	-3.0	0.0	+1.5 ~ -2.5	P	0.6
10000	-4.2	-4.4	0.2	+2.0 ~ -3.0	P	0.6
12500	-6.2	-6.2	0.0	+2.0 ~ -5.0	P	1.0
16000	-10.4	-8.5	-1.9	+2.5 ~ -16.0	P	1.0
20000	-20.4	-11.2	-9.2	+3.0 ~ -∞	P	1.0

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证书编号(Certificate No.): 2HB22001076-0003

### 6 自生噪声 (Autogenous noise)

计权 (Weighting)	实测值 (Actual)
	(dB)
A	18.8

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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)



## Catalogue of Sound Calibrator



### How to use the adapter

#### ■ 1-inch microphones

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



#### ■ 1/2-inch microphones

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



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

#### ■ 1/4-inch microphones

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



Usage example

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

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

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

### Strap



Securely carry the unit with the supplied hand strap

### Soft case



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

### PISTONPHONE NC-72A

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

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



JCSS  
JCSS 6197

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

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

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.

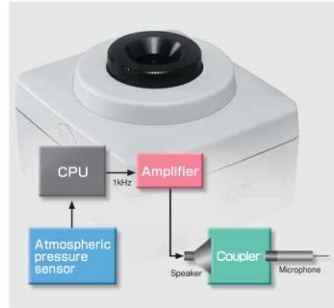


Usage example (NL series)

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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Page of



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

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

无影响证书中校准结果准确度的因素和缺陷。

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

2 声压级 (Sound Pressure Level)

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

3 频率 (Frequency)

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

4 总失真 (Distortion)

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

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ID: 013393

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Page of



# 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: 2HB21002020-0005  
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.	34678556	
管理号: Asset No.	AAST-SLC-06	
接收日期: Rec. Date	2021-09-09	校准日期: Cal. Date
签发日期: App. Date	2021-09-18	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 *赵文钰*

签发:  
Approved by *郭木力*

核验:  
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.): 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: $U_{10} \leq 0.001\%$ , $k=2$ ; 电压: $U_{10} = 0.04\%$ , $k=2$	频率: 0.001 Hz ~ 51.2 kHz, 电压: $(1 \sim 10^3) \sim 30$ V
标准传声器	LSx2021-13180/2022-04-24/中国计量院	$U = (0.05 \sim 0.20)$ dB ( $k=2$ )	20 Hz ~ 20 kHz
前置放大器	LSx2021-13000/2022-04-19/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 ≤ 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.

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

# Calibration Certificate of Sound Calibrator



证书编号(Certificate No.): 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.)
------------	--

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

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

#### Temperature

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

#### Relative Humidity (TA440 only)

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

#### Wet Bulb Temperature (TA440 only)

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

#### Dew Point (TA440 only)

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

#### Instrument Temperature Range

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

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

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

#### Logging Interval (TA430, TA440)

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

Specifications subject to change without notice.

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Airflow Instruments, TSI Instruments Ltd.  
Visit our website at [www.airflowinstruments.co.uk](http://www.airflowinstruments.co.uk) for more information.

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

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#### Time Constant (TA430, TA440)

User selectable

#### External Meter Dimensions

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

#### Meter Weight with Batteries

0.27 kg (0.6 lbs.)

#### Meter Probe Dimensions

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

#### Articulating Probe Dimensions

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

#### Power Requirements

Four AA-size batteries or AC adapter

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

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

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

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

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

# Calibration Certificate of Air Flow Meter



**Cal Lab Limited 校正實驗室有限公司**

Room 2103, Technology Plaza, 29-35 Sha Tsui Road,  
Tsuen Wan, NT, Hong Kong  
Tel: +852 25680106 Email: info@callab.com.hk  
Fax: +852 30116194 Website: www.callab.com.hk



**Calibration Certificate No.: CC0322201**

**Customer Information**

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

**Equipment Identification**

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

**Certificate Information**

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

**Reference Equipment Identification**

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

**Result of Calibration**

**Air Flow Rate**

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

CT-AFR-01

- Note1: The estimated expanded uncertainties have been calculated in "Evaluation and expression of uncertainty in measurement" and give an internal estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.  
 Note2: The standard (s) and instrument used in the calibration are traceable to national or international recognized standard and are calibrated on a schedule to maintain the accuracy and good condition.  
 Note3: The result reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long term stability of the instrument.  
 Note4: The result shows in this calibration certificate relate only to the item calibrated, and the result only applies to the calibration item as received.

Calibrated By:

*Rex Tse*  
Rex Tse

Checked and Approved By:

*Warren Yeung*  
Warren Yeung

Company Chop:



Certificate Issue Date: 25 January 2022

CT-BEG-03

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

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

CC0322201  
Page 1 of 1



**Cal Lab Limited 校正實驗室有限公司**

Room 2103, Technology Plaza, 29-35 Sha Tsui Road,  
Tsuen Wan, NT, Hong Kong  
Tel: +852 25680106 Email: info@callab.com.hk  
Fax: +852 30116194 Website: www.callab.com.hk



**Calibration Certificate No.: CC0332201**

**Customer Information**

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

**Equipment Identification**

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

**Certificate Information**

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

**Reference Equipment Identification**

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

**Result of Calibration**

**Air Flow Rate**

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

CT-AFR-01

- Note1: The estimated expanded uncertainties have been calculated in "Evaluation and expression of uncertainty in measurement" and give an internal estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.  
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 Note3: The result reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long term stability of the instrument.  
 Note4: The result shows in this calibration certificate relate only to the item calibrated, and the result only applies to the calibration item as received.

Calibrated By:

*Rex Tse*  
Rex Tse

Checked and Approved By:

*Warren Yeung*  
Warren Yeung

Company Chop:



Certificate Issue Date: 25 January 2022

CT-BEG-03

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

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

CC0332201  
Page 1 of 1

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

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

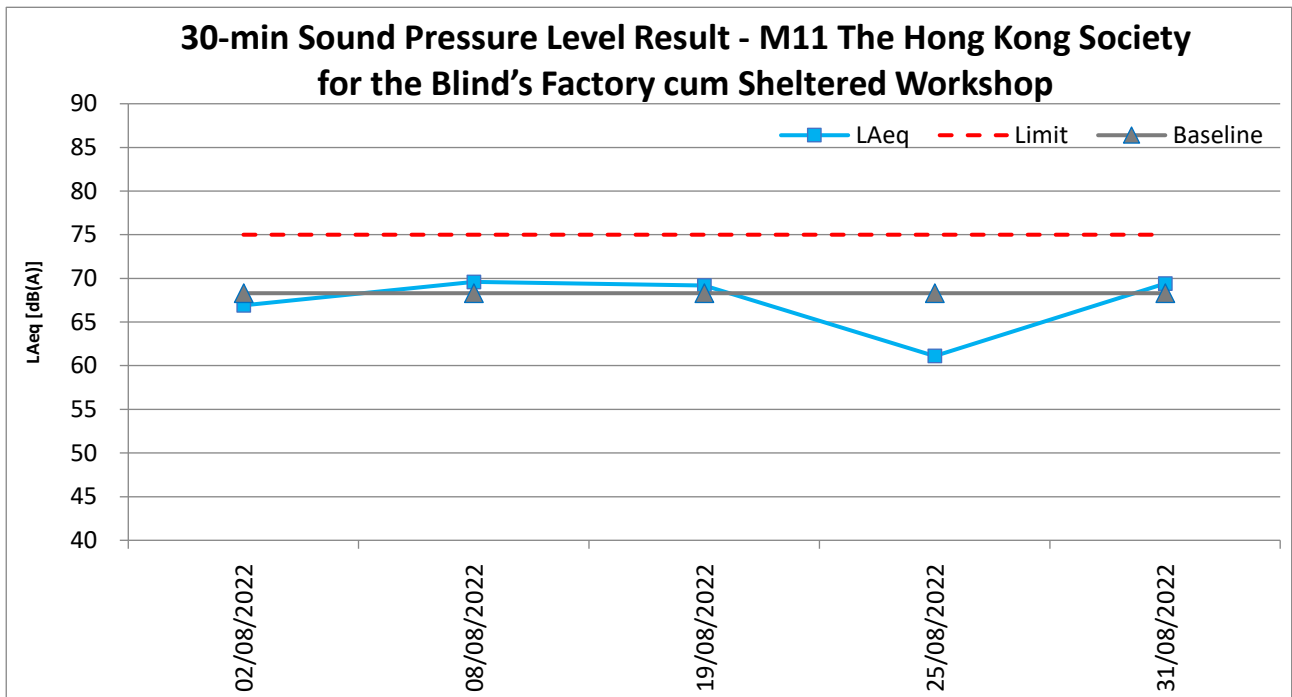
Date	Temp (°C)	Weather	Measured Noise Level at M11, dB(A)							Limit
			Time			Baseline	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	
02/08/2022	35.8	Sunny	11:30	-	12:00	68.3	66.9	70.5	59.5	75
08/08/2022	25.8	Cloudy	14:14	-	14:44	68.3	69.6	73.0	63.0	75
19/08/2022	27.7	Cloudy	10:03	-	10:33	68.3	69.2	71.9	63.3	75
25/08/2022	30.0	Cloudy	15:23	-	15:53	68.3	61.1	63.2	56.8	75
31/08/2022	33.3	Cloudy	14:53	-	15:23	68.3	69.4	71.6	61.3	75
Maximum							69.6			
Minimum							61.1			
Average							68.1			

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

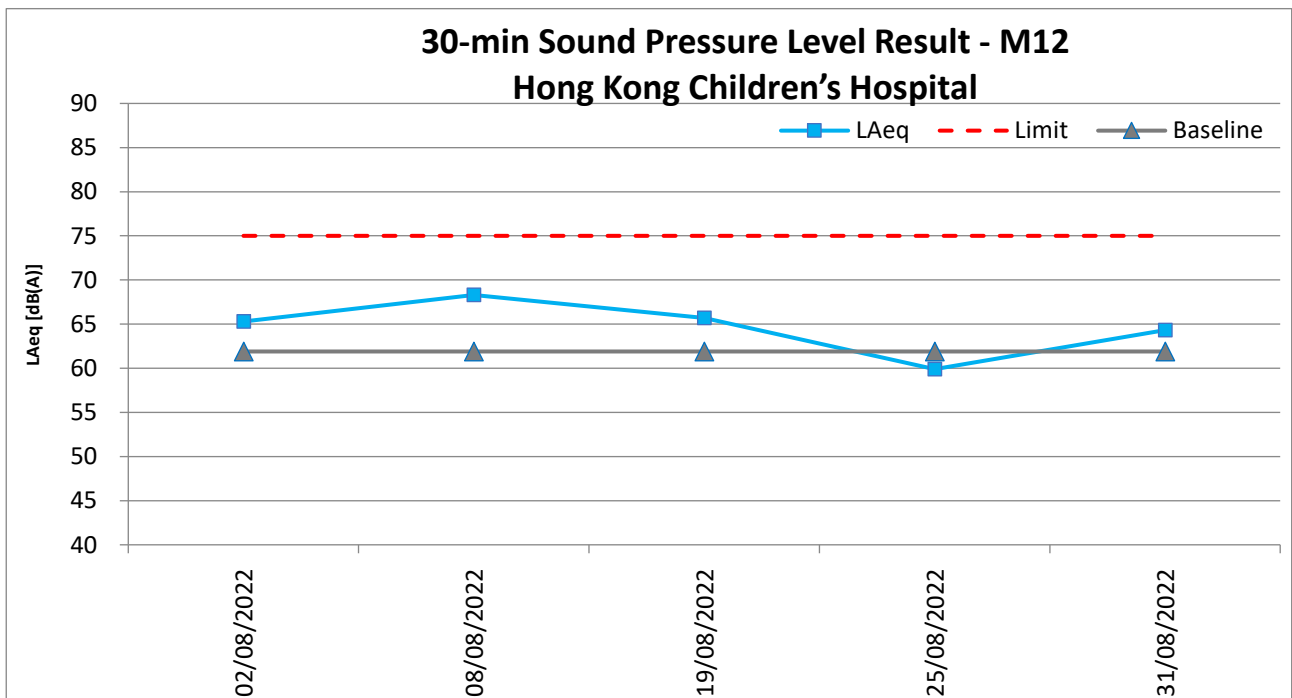
Date	Temp (°C)	Weather	Measured Noise Level at M12, dB(A)							Limit
			Time			Baseline	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	
02/08/2022	35.8	Sunny	14:14	-	14:44	61.9	65.3	66.8	63.2	75
08/08/2022	25.8	Cloudy	9:36	-	10:06	61.9	68.3	71.2	60.8	75
19/08/2022	27.7	Cloudy	13:21	-	13:51	61.9	65.7	67.8	63.0	75
25/08/2022	30.0	Cloudy	17:13	-	17:43	61.9	59.9	61.0	58.8	75
31/08/2022	33.3	Cloudy	10:21	-	10:51	61.9	64.3	66.3	61.7	75
Maximum							68.3			
Minimum							59.9			
Average							65.4			



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



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





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

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

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

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

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

**Appendix N – Waste Flow Table**

## Appendix F - Monthly Summary Waste Flow Table

Name of Department: CEDD

Contract No.: ED/2018/01

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

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
Jan	0.832	--	--	--	0.832	--	--	0.100	--	--	0.144
Feb	0.749	--	0.450	--	0.299	--	--	--	--	--	0.124
Mar	0.768	--	--	--	0.768	--	--	--	--	--	0.154
Apr	0.488	--	--	--	0.488	--	--	--	--	--	0.167
May	2.374	--	--	--	2.374	--	--	--	--	--	0.190
Jun	2.555	--	0.442	--	1.857	0.256	--	--	--	--	0.174
<b>Sub-total</b>	<b>7.766</b>	<b>--</b>	<b>0.892</b>	<b>--</b>	<b>6.618</b>	<b>0.256</b>	<b>--</b>	<b>0.100</b>	<b>--</b>	<b>--</b>	<b>0.953</b>
July	3.255	--	--	--	3.255	--	--	--	--	--	0.158
Aug	4.764	--	--	--	4.614	0.15	--	0.118	--	--	0.283
Sep											
Oct											
Nov											
Dec											
<b>Total</b>	<b>15.785</b>	<b>--</b>	<b>0.892</b>	<b>--</b>	<b>14.487</b>	<b>0.406</b>	<b>--</b>	<b>0.218</b>	<b>--</b>	<b>--</b>	<b>1.394</b>
Forecast of Total Quantities of C&D Materials to be Generated from the Contract*											
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper / cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse	
(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )	
<b>195.01</b>	<b>2.103</b>	<b>10.2</b>	<b>140</b>	<b>19.81</b>	<b>25</b>	<b>200</b>	<b>0.8</b>	<b>0.1</b>	<b>--</b>	<b>3.4</b>	

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

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



<b>Implementation Schedule for Air Quality Measures</b>			
<b>EIA for KTD Development Ref.</b>	<b>EIA for KTD – Roads D3A &amp; D4A Ref.</b>	<b>Environmental Protection Measures / Mitigation Measures</b>	<b>Status</b>
S3.2		8 times daily watering of the work site with active dust emitting activities.	^
S3.2	S4.8	Implementation of dust suppression measures stipulated in Air Pollution Control (Construction Dust) Regulation. The following mitigation measures, good site practices and a comprehensive dust monitoring and audit programme are recommended to minimize cumulative dust impacts.	^
		- Stockpiling site(s) should be lined with impermeable sheeting and bunded. Stockpiles should be fully covered by impermeable sheeting to reduce dust emission.	^
		- Misting for the dusty material should be carried out before being loaded into the vehicle.	^
		- Any vehicle with an open load carrying area should have properly fitted side and tail boards.	^
		- Material having the potential to create dust should not be loaded from a level higher than the side and tail boards and should be dampened and covered by a clean tarpaulin.	^
		- The tarpaulin should be properly secured and should 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 inside the site. On-site unpaved roads should be compacted and kept free of loose 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 hardcore.	^
		- 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.	^
		- Every stock of more than 20 bags of cement should be covered entirely by impervious sheeting placed in an area sheltered on the top and the three sides.	^
		- Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites.	^

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

			
Date:	04 August 2022	Date:	11 August 2022
Mitigation Measures:	Provided domestic garbage bins for waste storage.	Mitigation Measures:	Equipment with QPME label was used.
			
Date:	25 August 2022	Date:	25 August 2022
Mitigation Measures:	The portable toilets were provided in the construction site.	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: August 2022**

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

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

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

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



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

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

# FUGRO TECHNICAL SERVICES LIMITED

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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**

August 2022

(Version 1.1)

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

(Environmental Team Leader)

Date: 14 September 2022  
Your ref:  
Our ref: PL-202209031

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

**Attn.: Mr. Mavis Law, SRE**

Dear Ms. Law,

**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 (August 2022)**

Reference is made to the Monthly EM&A Report (August 2022) (Version 1.1) issued by the Environmental Team on 13 September 2022.

Please be informed that we have no adverse comment on the captioned submission. We hereby verify the Monthly EM&A Report (August 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	Attn.: Mr. Albert Tse	By email
	Ka Shing	Attn.: Mr. Chan Pang (ETL)	By email

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## EXECUTIVE SUMMARY

1. This is the 19<sup>th</sup> Monthly Environmental Monitoring & Audit (EM&A) report which summarises the findings of the EM&A Programme during the reporting period from 1 to 31 August 2022.

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

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

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

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

### **Complaint log**

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

*Table II Summary of complaints in the Reporting Month*

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

**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:
- Pile column construction for PC9, PC10 and PC11 for Elevated Walkway LW-02
  - Erection of falseworks and working platform for decking of Elevated Walkway LW-02
  - UU diversion at Sa Po Road under TTA Stage 2A
  - Sheetpile installation at Sa Po Road under TTA Stage 2A
  - RC construction at launching shaft for subway SB-01

- Construction works for Pedestrian Street No. 2
- Construction works for Road L16
- Construction of DCS
- RC construction for Subway KS10 Lift and Staircase
- Renovation works for existing subways KS9 and KS32

**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
Pile column construction for PC9, PC10 and PC11 at Elevated Walkway LW-02	Noise and Air Quality
Erection of falsework and working platform for decking of Elevated Walkway LW-02	Noise and Air Quality
Construction of Crowd Dispersal Route	Noise and Air Quality
Construction of Road L16	Noise and Air Quality
Construction of DCS	Noise and Air Quality
Construction works for Pedestrian Street No. 2	Noise and Air Quality
UU diversion works at Sa Po Road	Noise and Air Quality
Sheetpile installation at Sa Po Road under TTA Stage 2A	Noise and Air Quality
RC construction for launching shaft for subway SB-01	Noise and Air Quality
Renovation works for existing subway KS9 and KS32	Noise and Air Quality
RC construction for Subway KS10 Lift and Staircase	Noise and Air Quality
Twin rising main connection works	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.	E-mail
Civil Engineering and Development Department (CEDD)	Project Proponent	Mr. Lam Shing Tim	Permit Holder	3842 7090	st_lam@cedd.gov.hk
AECOM Asia Co. Ltd. (AECOM)	Supervisor (act as Engineers' Representative (ER) listed in EM&A Manual)	Mr. Vincent Lee	Supervisor's Delegate	2798 0771	sre2@ktd-stage5.com
Acuity Sustainability Consulting Limited (Acuity)	Independent Environmental Checker (IEC)	Mr. Kevin Li	IEC	9779 2247	kli@acuityhk.com
Ka Shing Management Consultant Limited (Ka Shing)	Environmental Team (ET)	Mr. Pang Chan	ET Leader	6082 2973	stage5b@ka-shing.net
Build King – STEC Joint Venture (BK-STEC)	Contractor	Mr. Rex Lau	Contractor's Representative	6282 5154	rex.lau@buildking.hk

## **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*

Pile column construction for PC9, PC10 and PC11 for Elevated Walkway LW-02	Construction works for Pedestrian Street No. 2
Erection of falseworks and working platform for decking of Elevated Walkway LW-02	Construction works for Road L16
UU diversion at Sa Po Road under TTA Stage 2A	Construction of DCS
Sheetpile installation at Sa Po Road under TTA Stage 2A	RC construction for Subway KS10 Lift and Staircase
RC construction at launching shaft for subway SB-01	Renovation works for existing subways KS9 and KS32

## **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 2.3	Updated Management Organization of Main Construction Companies	4 July 2022
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 3.3	Monthly EM&A Report (July 2022)	10 August 2022

## 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	2	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	2	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 designated 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)	33	21 – 43	175	260
AM3	39	20 – 58	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)	31	18 – 41	302	500
AM3	38	30 – 55	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/NC 74	2	1 year
Air Flowmeter	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)	69.5	69.2 – 69.8	When one documented complaint is received	75 dB(A)
M5(A)	72.8	72.1 – 73.4		

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 (August 2022) $\mu\text{g}/\text{m}^3$
		Scenario 1 (Mid 2009 to Mid 2013), $\mu\text{g}/\text{m}^3$	Scenario 2 (Mid 2013 to Late 2016), $\mu\text{g}/\text{m}^3$	
AM2(A) - Ng Wah Catholic Secondary School	NA	NA	NA	21 – 43
AM3 - Sky Tower	A40 <sup>^</sup>	106 <sup>^</sup>	138 <sup>^</sup>	20 – 58

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 (August 2022) $\mu\text{g}/\text{m}^3$
		Scenario 1 (Mid 2009 to Mid 2013), $\mu\text{g}/\text{m}^3$	Scenario 2 (Mid 2013 to Late 2016), $\mu\text{g}/\text{m}^3$	
AM2(A) - Ng Wah Catholic Secondary School	NA	NA	NA	18 – 41
AM3 - Sky Tower	A40 <sup>^</sup>	217 <sup>^</sup>	247 <sup>^</sup>	30 – 55

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 (August 2022) L <sub>Aeq, 30min</sub> , dB(A)
M4(A) – Le Billionnaire	NA	NA	69.2 – 69.8
M5(A) – Prince Ritz	NA	NA	72.1 – 73.4

- 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. Non-project related construction activities in the adjacent construction sites were observed during the reporting period and may affect the monitoring results.
- 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. Non-project related construction activities in the adjacent construction sites were observed during the reporting period and may affect the monitoring results.
- 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 4, 11, 18 and 26 August 2022 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
4 August 2022	No	NA	NA
11 August 2022	No	NA	NA
18 August 2022	No	NA	NA
26 August 2022	No	NA	NA

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

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

## 6. ENVIRONMENTAL SITE INSPECTION AND AUDIT





### Site Inspection





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

6.2 Site inspections were conducted on 4, 11, 18 and 26 August 2022 in the reporting month.

6.3 The summaries of site audits are attached in Table 6.1.

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

Inspection Date	Key Observations	Recommendations / Actions	Close-out Date / Status
4 August 2022	 <p>Observation: Vehicle should be restricted to maximum speed of 10 km per hour in SB01.</p>	 <p>Action Taken: Vehicle has been restricted to maximum speed of 8 km per hour in LW02.</p>	Closed out on 11 August 2022
11 August 2022	 <p>Observation: The QPME label for the generator is missing.</p>	 <p>Action Taken: The QPME label has been display for the generator.</p>	Closed out on 18 August 2022

Inspection Date	Key Observations	Recommendations / Actions	Close-out Date / Status
18 August 2022	 <p>Observation: 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 three sides.</p>	 <p>Action taken: Cement bags have been fully covered by impervious sheeting.</p>	Closed out on 26 August 2022
26 August 2022	 <p>Observation: Secondary container shall be provided for the plastic diesel engine oil container to prevent soil contamination.</p>	 <p>Action Taken: Plastic diesel engine oil container has been removed.</p>	Closed out on 1 September 2022

**Status of Waste Management**

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

6.5 The Contractor was registered as a chemical waste producer for the Project. The Contractor was reminded that chemical waste containers should be properly treated and stored

temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

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

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

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

Environmental Licenses, Notifications and Permits	Ref. No.	Valid Form	Valid Till
Environmental Permit under EIAO	EP-337/2009	23 Apr 2009	N/A
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 Mar 2021	31 Mar 2026
	WT00037370-2021		
	WT00038562-2021	15 Jul 2021	31 Jul 2026
Construction Noise Permit	GW-RE0605-22	21 Jun 2022	20 Oct 2022
	GW-RE0614-22	22 Jun 2022	19 Dec 2022
	GW-RE0615-22	22 Jun 2022	19 Dec 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
No complaint was received in the reporting month.	NA	NA	NA	NA

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 the reporting month.	NA	NA	NA	NA

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 are 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
Pile column construction for PC9, PC10 and PC11 at Elevated Walkway LW-02	Noise and Air Quality
Erection of falsework and working platform for decking of Elevated Walkway LW-02	Noise and Air Quality
Construction of Crowd Dispersal Route	Noise and Air Quality
Construction of Road L16	Noise and Air Quality
Construction of DCS	Noise and Air Quality
Construction works for Pedestrian Street No. 2	Noise and Air Quality
UU diversion works at Sa Po Road	Noise and Air Quality
Sheetpile installation at Sa Po Road under TTA Stage 2A	Noise and Air Quality
RC construction for launching shaft for subway SB-01	Noise and Air Quality
Renovation works for existing subway KS9 and KS32	Noise and Air Quality
RC construction for Subway KS10 Lift and Staircase	Noise and Air Quality
Twin rising main connection works	Noise and Air Quality

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

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

- Strictly following the Environmental Permits and Licenses, and
- Provide sufficient mitigation measures as recommended in Approved EIA Reports.

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.

**Figure**

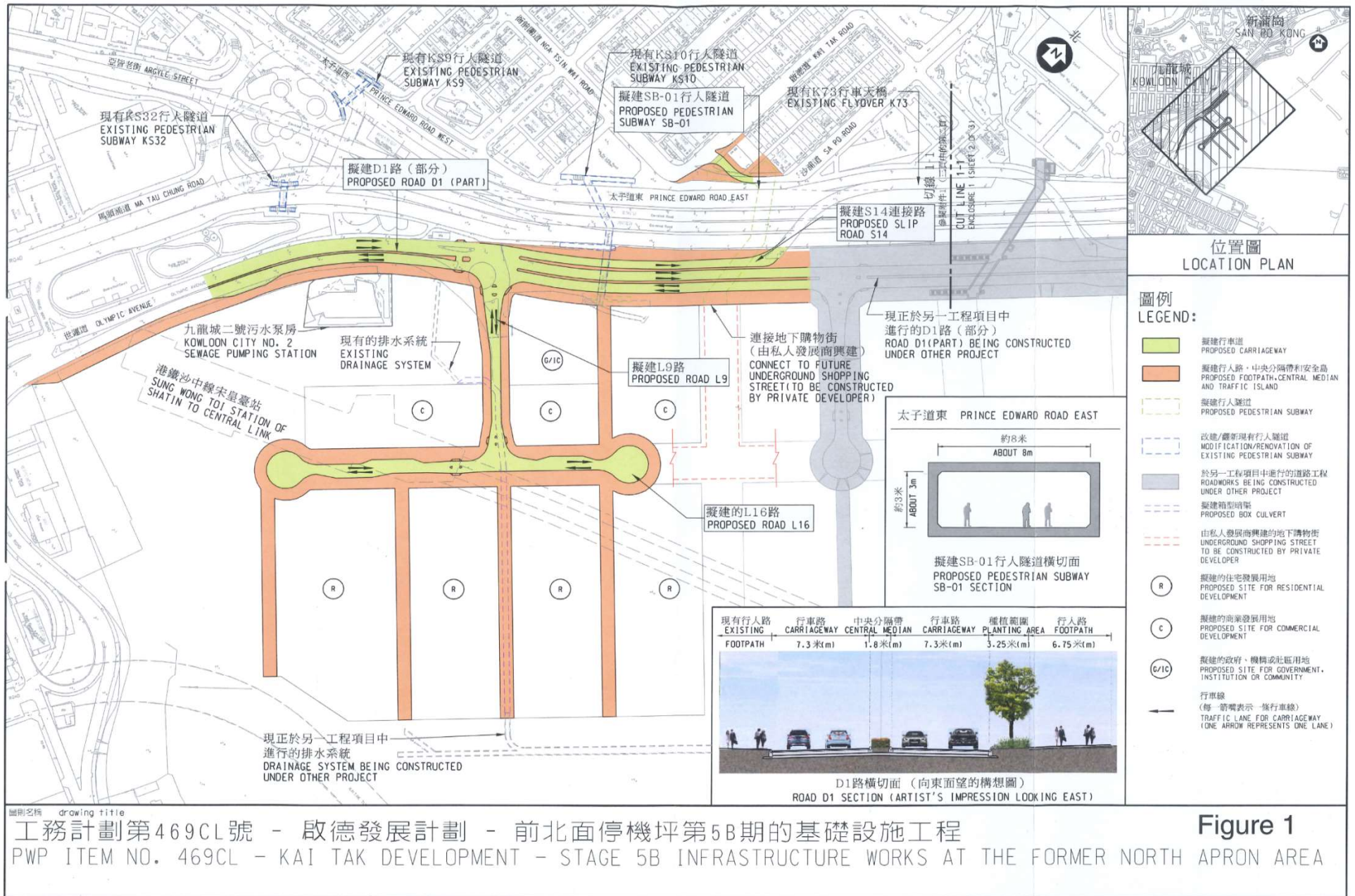


Figure 1 – Proposed works of Contract No. ED/2018/05



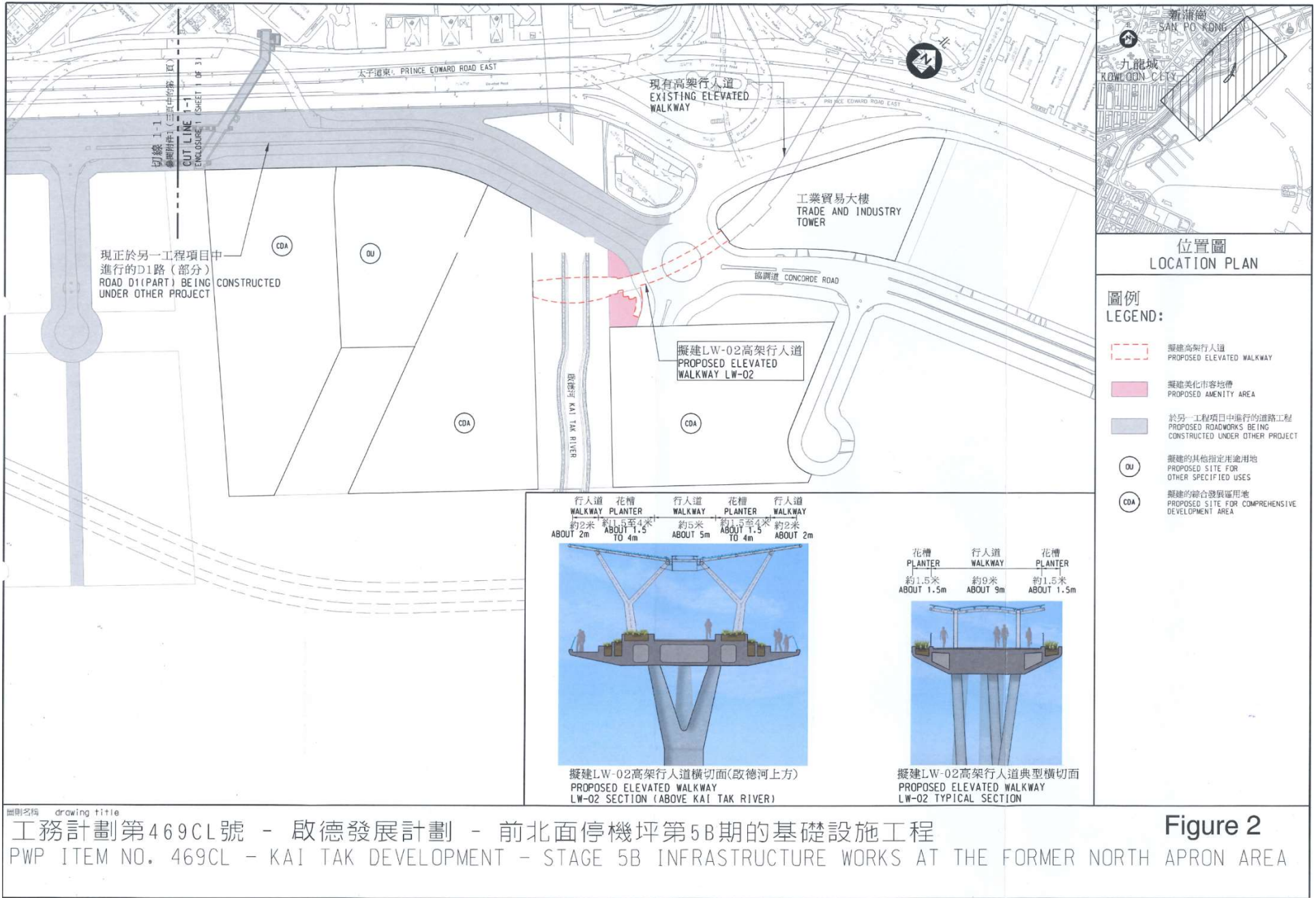
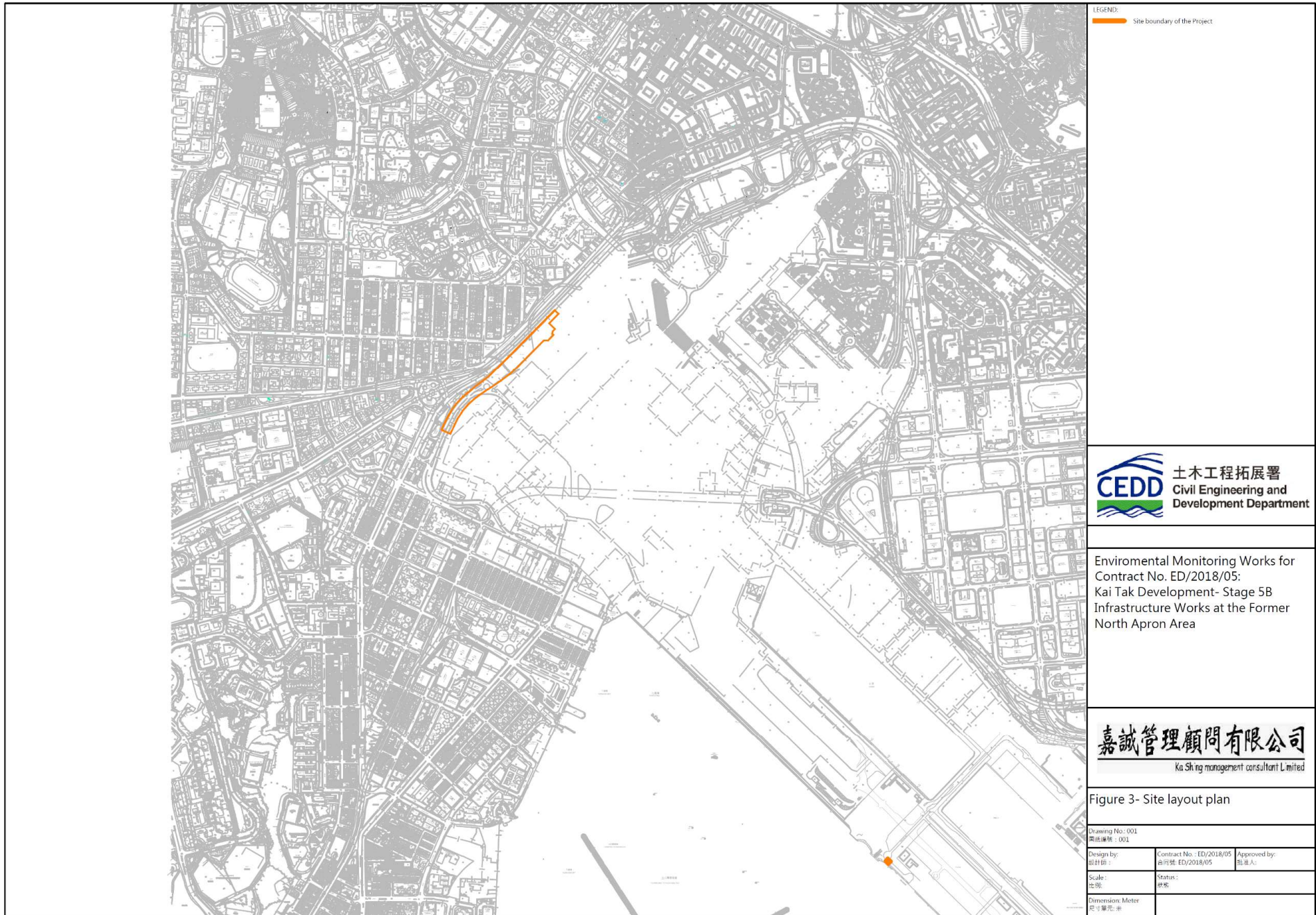


Figure 2

Figure 2 – Proposed works of Contract No. ED/2018/05



LEGEND:  
— Site boundary of the Project

**CEDD** 土木工程拓展署  
 Civil Engineering and Development Department

Environmental Monitoring Works for  
 Contract No. ED/2018/05:  
 Kai Tak Development- Stage 5B  
 Infrastructure Works at the Former  
 North Apron Area

**嘉誠管理顧問有限公司**  
 Ka Shing management consultant Limited

Figure 3- Site layout plan

Drawing No.: 001 圖則編號: 001		
Design by: 設計師:	Contract No.: ED/2018/05 合約號: ED/2018/05	Approved by: 批准人:
Scale: 比例:	Status: 狀態:	
Dimension: Meter 尺寸單位: 米		

Figure 3 – D1 Road Site Layout Plan



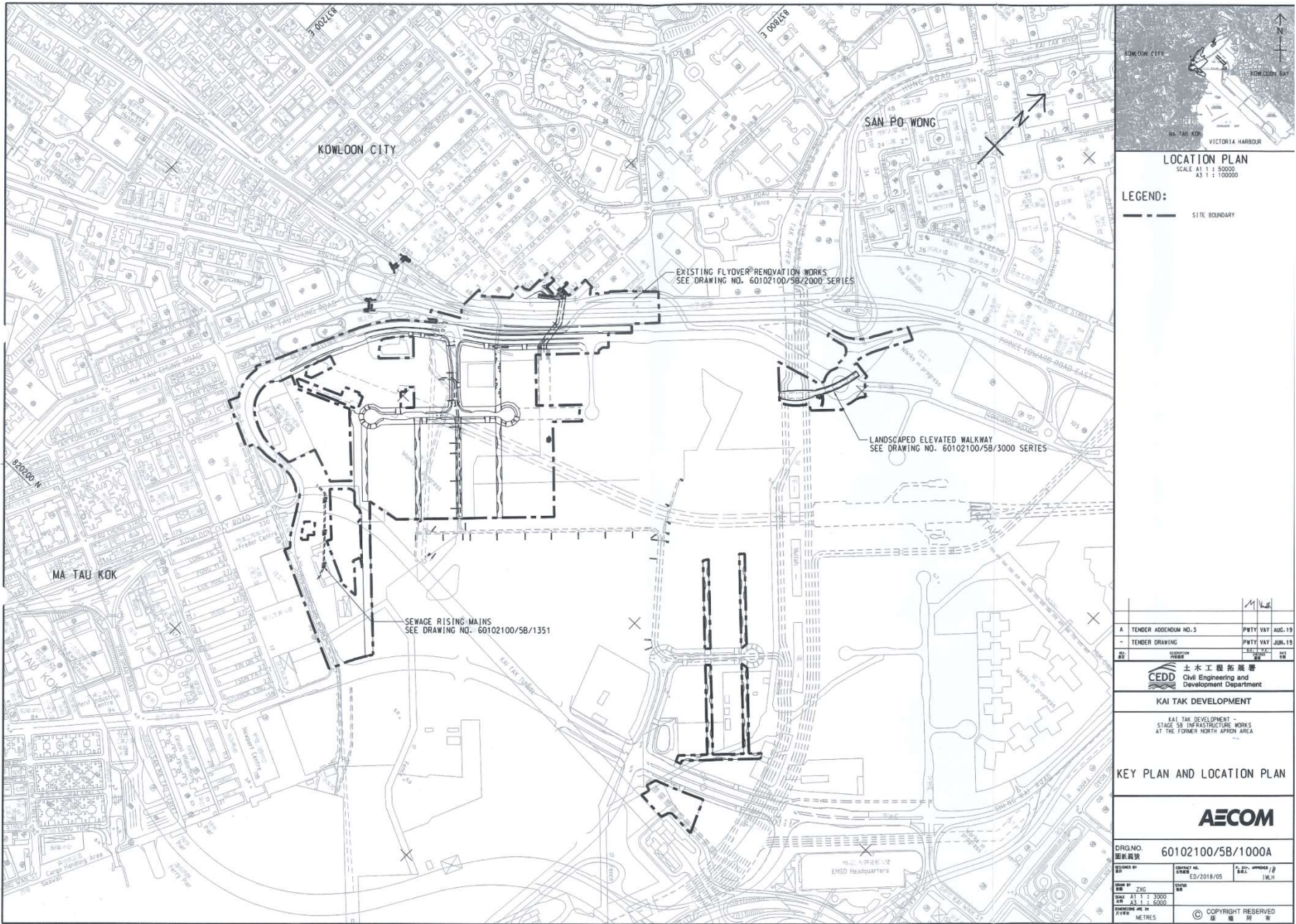
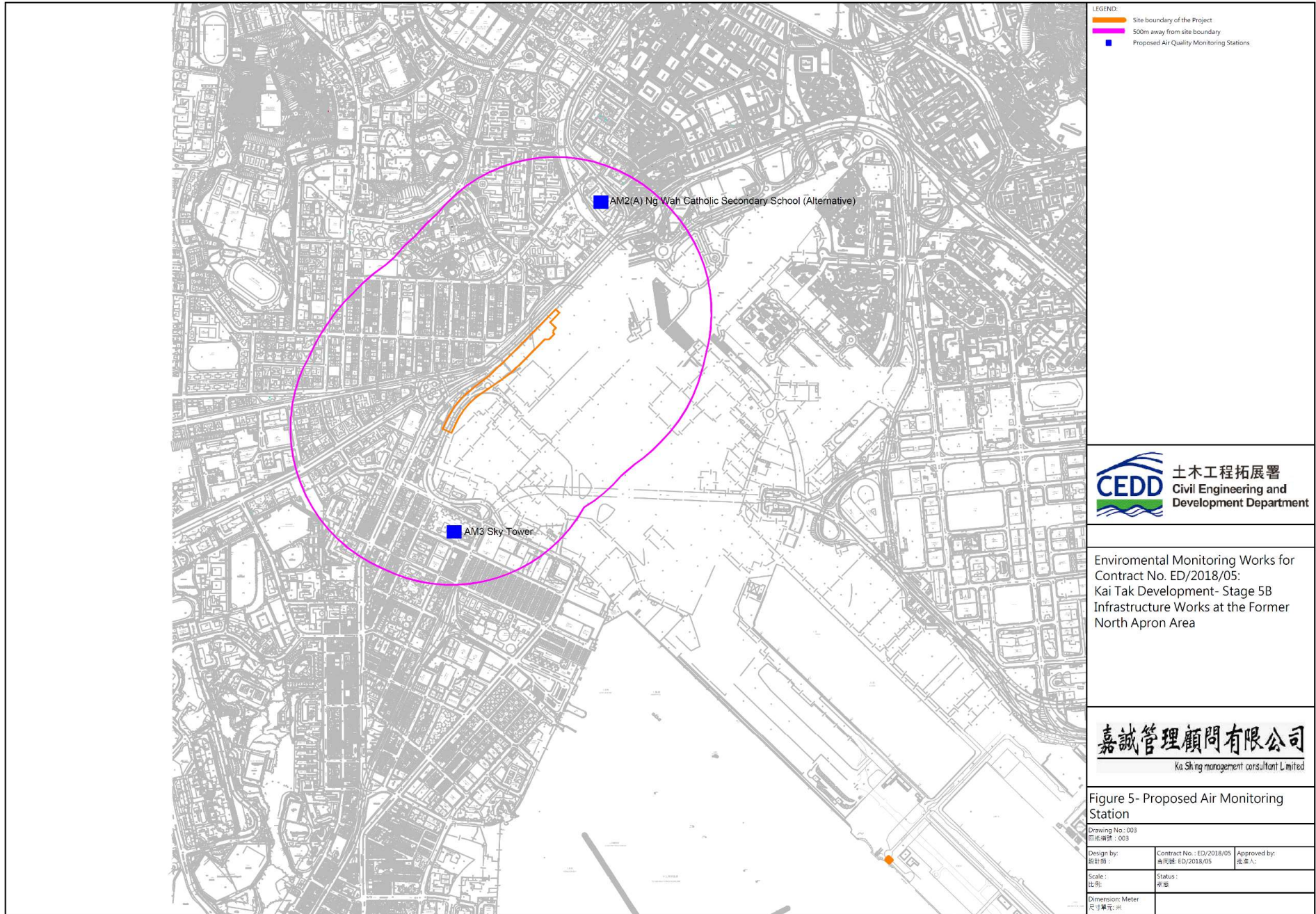


Figure 4 – Site Layout Plan





LEGEND:  
 Site boundary of the Project  
 500m away from site boundary  
 Proposed Air Quality Monitoring Stations

**CEDD** 土木工程拓展署  
 Civil Engineering and Development Department

Environmental Monitoring Works for  
 Contract No. ED/2018/05:  
 Kai Tak Development- Stage 5B  
 Infrastructure Works at the Former  
 North Apron Area

嘉誠管理顧問有限公司  
 Ka Shing management consultant Limited

Figure 5- Proposed Air Monitoring Station

Drawing No.: 003 圖紙編號: 003		
Design by: 設計師:	Contract No.: ED/2018/05 合約號: ED/2018/05	Approved by: 批準人:
Scale: 比例:	Status: 狀態:	
Dimension: Meter 尺寸單位: 米		

Figure 5 – Air Quality Monitoring Stations



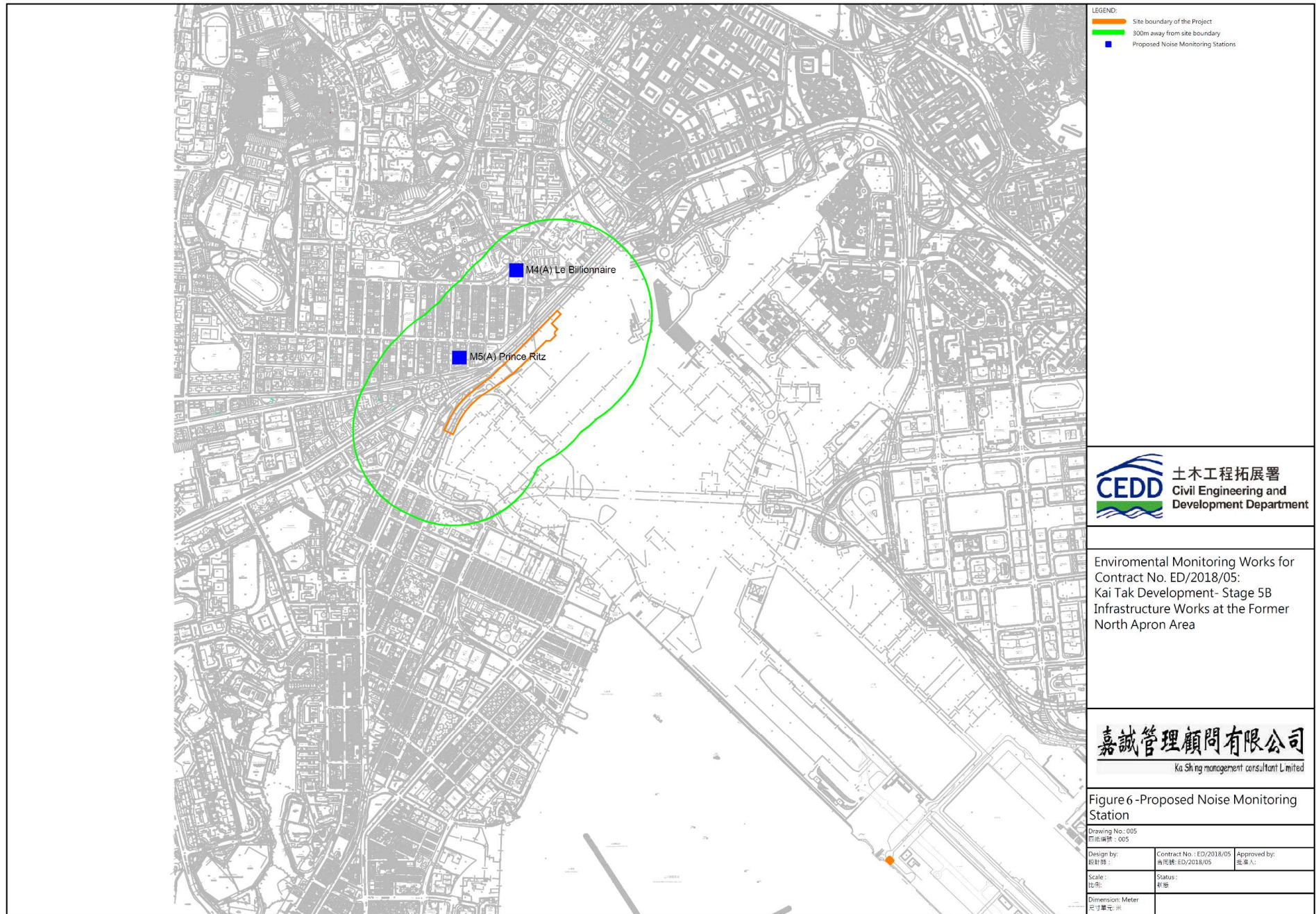
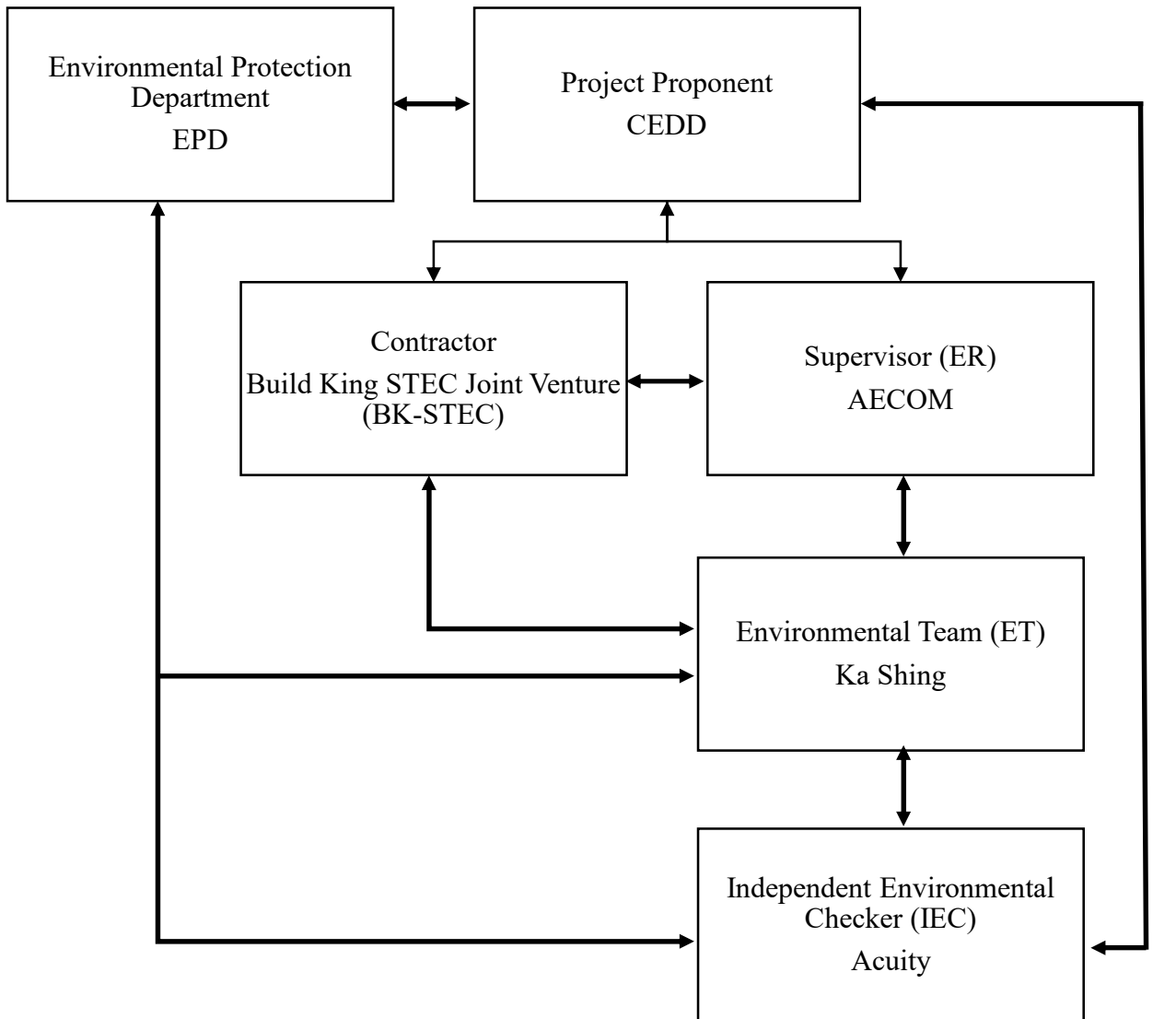


Figure 6 – Noise Monitoring Stations

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



↔	Link of communication
---	-----------------------

# Appendix B – Construction Programme

















**Appendix C – Environmental monitoring schedules**

Contract No. EDO 2/2020 Environmental Monitoring at Kai Tak Development – Stage 5B infrastructure works at the former north apron area  
 Environmental Monitoring and Weekly Site Inspection Schedule for August 2022

August 2022

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	3	4 Weekly Site Inspection	5	6
7	8 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	9	10	11 Weekly Site Inspection	12	13 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3
14	15	16	17	18 Weekly Site Inspection	19 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	20
21	22	23	24	25 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	26 Weekly Site Inspection + SSMC meeting	27
28	29	30	31 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)			

**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

Contract No. EDO 2/2020 Environmental Monitoring at Kai Tak Development – Stage 5B infrastructure works at the former north apron area  
Tentative Environmental Monitoring and Weekly Site Inspection Schedule for September 2022

September 2022

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1 Weekly Site Inspection	2	3
4	5 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	6	7	8 Weekly Site Inspection	9	10 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3
11	12	13	14	15 Weekly Site Inspection	16 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	17
18	19	20	21	22 Weekly Site Inspection 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	23	24
25	26	27	28 24-hr TSP and 1-hrX3 TSP: AM2(A), AM3 30-min Noise: M4(A), M5(A)	29 Weekly Site Inspection + SSMC meeting	30	

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  
145 S. Miami Ave  
Cleveland, OH 45002  
513-487-9000  
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-01-2022062901 Date of calibration : 29/06/2022  
 Location : Sky Tower Sampler : TE-5170X  
 Serial Number : 4687

**Calibration Data**

Ambient barometric pressure, Pa = 751.6 ( mmHg ) Ambient temperature, Ta = 305.65 ( deg K )

**Calibration Orifice**

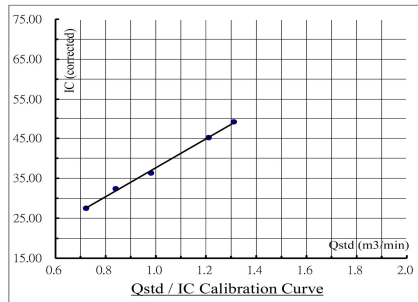
Model = TE-5025A Qstd Slope, m = 2.06418  
 Serial No. = 0006 Qstd Intercept, b = -0.03593  
 Calibration Due Date: 16/05/2023 Qstd Corr. coeff., r = 0.99993

**Calibration Curve**

Plate No.	H <sub>2</sub> O (in)	Qstd (m <sup>3</sup> /min)	I (chart)	IC (corrected)
18	7.40	1.311	50.0	49.10
13	6.30	1.211	46.0	45.17
10	4.10	0.981	37.0	36.33
7	3.00	0.841	33.0	32.40
5	2.20	0.723	28.0	27.49

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1/m [ I ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	36.223	1.3899	0.9989



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 : Ben Poon 29/06/2022 Checked by : Tommy Wong 29/06/2022  
 Name : ( Ben Poon ) Name : ( Tommy Wong )

Form No. INS-HVS-CAL.dd 16.01.2020

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

Calibration curve ref. No. : ATSPC-01-2022062904 Date of calibration : 29/06/2022  
 Location : Ng Wah Catholic Secondary School Sampler : TE-5170X  
 Serial Number : 4360

**Calibration Data**

Ambient barometric pressure, Pa = 751.6 ( mmHg ) Ambient temperature, Ta = 305.65 ( deg K )

**Calibration Orifice**

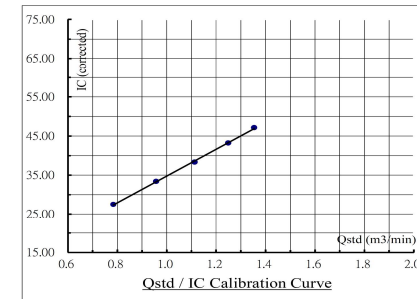
Model = TE-5025A Qstd Slope, m = 2.06418  
 Serial No. = 0006 Qstd Intercept, b = -0.03593  
 Calibration Due Date: 16/05/2023 Qstd Corr. coeff., r = 0.99993

**Calibration Curve**

Plate No.	H <sub>2</sub> O (in)	Qstd (m <sup>3</sup> /min)	I (chart)	IC (corrected)
18	7.90	1.354	48.0	47.13
13	6.70	1.249	44.0	43.21
10	5.30	1.113	39.0	38.30
7	3.90	0.957	34.0	33.39
5	2.60	0.784	28.0	27.49

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1/m [ I ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	34.211	0.5666	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 : Ben Poon 29/06/2022 Checked by : Tommy Wong 29/06/2022  
 Name : ( Ben Poon ) Name : ( Tommy Wong )

Form No. INS-HVS-CAL.dd 16.01.2020

## Calibration Certificate of HVS

### Air Sampler Calibration Curve Plotting & Calculation

(Dickson recorder)

Calibration curve ref. No. : ATSPC-01-2022082601      Date of calibration : 26/08/2022

Model no : Sky Tower      Sampler : TE-5170X  
Serial Number : 4687

**Calibration Data**

Ambient barometric pressure, Pa = 757.6 ( mmHg )      Ambient temperature, Ta = 303.45 ( deg K )

**Calibration Orifice**

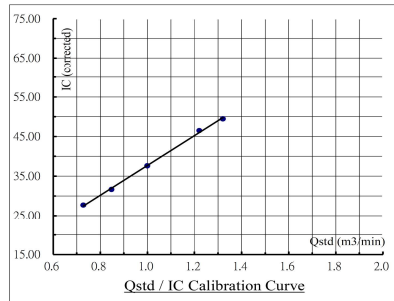
Model = TE-5025A      Qstd Slope, m = 2.06418  
Serial No. = 0006      Qstd Intercept, b = -0.03593  
Calibration Due Date: 16/05/2023      Qstd Corr. coeff., r = 0.99993

**Calibration Curve**

Plate No.	H <sub>2</sub> O (in)	Qstd (m <sup>3</sup> /min)	I (chart)	IC (corrected)
18	7.40	1.321	50.0	49.47
13	6.30	1.221	47.0	46.50
10	4.20	1.000	38.0	37.60
7	3.00	0.848	32.0	31.66
5	2.20	0.728	28.0	27.70

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1/m [ I ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	37.600	0.0989	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 : Ben Poon      26/08/2022      Checked by : Tommy Wong      26/08/2022  
Name : ( Ben Poon )      Name : ( Tommy Wong )

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

### Air Sampler Calibration Curve Plotting & Calculation

(Dickson recorder)

Calibration curve ref. No. : ATSPC-01-2022082604      Date of calibration : 26/08/2022

Model no : Ng Wah Catholic Secondary School      Sampler : TE-5170X  
Serial Number : 4360

**Calibration Data**

Ambient barometric pressure, Pa = 757.6 ( mmHg )      Ambient temperature, Ta = 303.45 ( deg K )

**Calibration Orifice**

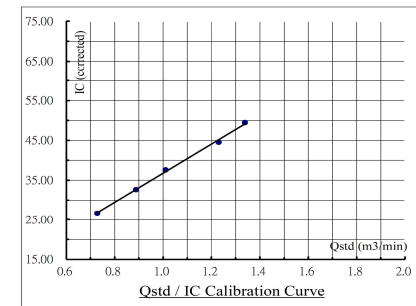
Model = TE-5025A      Qstd Slope, m = 2.06418  
Serial No. = 0006      Qstd Intercept, b = -0.03593  
Calibration Due Date: 16/05/2023      Qstd Corr. coeff., r = 0.99993

**Calibration Curve**

Plate No.	H <sub>2</sub> O (in)	Qstd (m <sup>3</sup> /min)	I (chart)	IC (corrected)
18	7.60	1.339	50.0	49.47
13	6.40	1.230	45.0	44.52
10	4.30	1.011	38.0	37.60
7	3.30	0.888	33.0	32.65
5	2.20	0.728	27.0	26.71

**Subsequent calculation of sampler flow**

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1/m [ I ( \text{Sqrt} ( ( Pa / 760 ) ( 298 / Ta ) ) ) - b ]$	36.535	0.2228	0.9989



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 : Ben Poon      26/08/2022      Checked by : Tommy Wong      26/08/2022  
Name : ( Ben Poon )      Name : ( Tommy Wong )

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

# Calibration Certificate of HVS used for performance check of Dust Meter

# Orifice Transfer Standard Certification Worksheet TE-5025A

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

Calibration curve ref. No. : ATSPC-01-2022061301 Date of calibration : 20/06/2022  
 Model no : GS2310 Serial number : 10346

**Calibration Data**  
 Ambient barometric pressure, Pa = 753.1 ( mmHg ) Ambient temperature, Ta = 303.35 ( deg K )

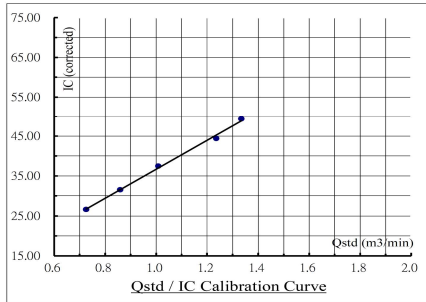
**Calibration Orifice**  
 Model = TE-5025A Qstd Slope, m = 2.06418  
 Serial No. = 0006 Qstd Intercept, b = -0.03593  
 Calibration Due Date: 16/05/2023 Qstd Corr. coeff., r = 0.99993

### Calibration Curve

Plate No.	H <sub>2</sub> O ( in )	Qstd ( m <sup>3</sup> / min )	I ( chart )	IC ( corrected )
18	7.60	1.335	50.0	49.33
13	6.50	1.236	45.0	44.40
10	4.30	1.009	38.0	37.49
7	3.10	0.859	32.0	31.57
5	2.20	0.726	27.0	26.64

### Subsequent calculation of sampler flow

Method	Calibration equation	Slope, m	Intercept, b	Corr. coeff., r
Dickson recorder	$Qstd = 1/m [ I ( \text{Chart} ) ( \text{Pa} / 760 ) ( 298 / \text{Ta} ) ] - b$	36.268	0.4215	0.9982



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

Calibrated by : Ben Poon 20/06/2022 Checked by : Tommy Wong 20/06/2022  
 Name : ( Ben Poon ) Name : ( Tommy Wong )

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



**RECALIBRATION  
DUE DATE:  
May 16, 2023**

## Certificate of Calibration

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

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

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

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

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

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 TOLL FREE: (877)263-7610  
 FAX: (513)467-9009



## Catalogue of Dust Meter (TSI Sidepak AM510)

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

### User Friendly

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

### Advanced Features

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

### Quick and Easy Reports

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

### Power to Spare

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

### Model AMS10

#### SidePak Personal Aerosol Monitor

#### Sensitivity

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

#### Flow Rate

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

#### Temperature Range

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

#### Operational Humidity

0 to 95% RH, non-condensing

#### Time Constant (LCD display)

Range	User-adjustable, 1 to 60 seconds
-------	----------------------------------

#### Data Logging

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

#### User-Select Calibration Factors

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

#### Physical

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

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

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

### Maintenance

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

### Communications Interface

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

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

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

### Battery Performance

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

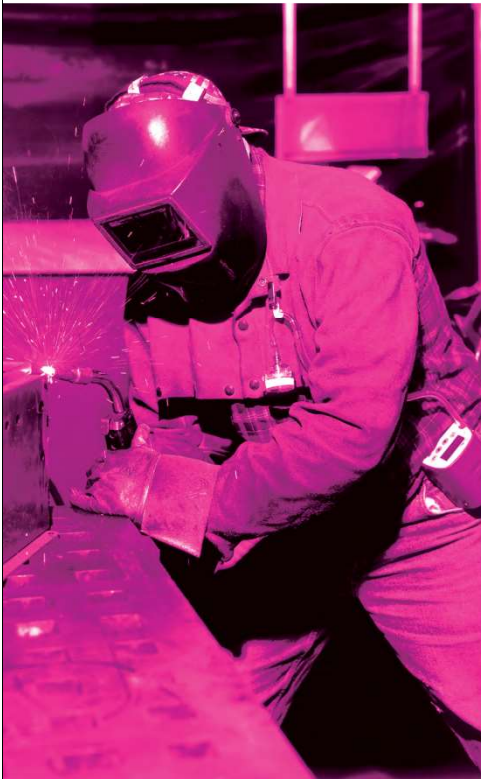
\*Of a fully depleted battery

\*\*All dust plugs and dust gaskets must be installed.

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

### Battery Level Indicator

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



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

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

Environment Conditions		<b>Model</b>	<b>AM510</b>
Temperature	72.76 (22.6) °F (°C)		
Relative Humidity	14.4 %RH		
Barometric Pressure	29.41 (995.9) inHg (hPa)		
		<b>Serial Number</b>	<b>11306015</b>

As Left       In Tolerance  
 As Found       Out of Tolerance

**Concentration Linearity Plot**  

System ID: DT101-02

CONCENTRATION							Unit: mg/m <sup>3</sup>	
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE	
1	1.175	1.158	1.057-1.293	3	0.049	0.050	0.034-0.064	
2	0.172	0.173	0.146-0.198	4	12.440	12.556	11.196-13.684	

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, AI test dust (Art-ona 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	08-30-21	02-28-22
Microbalance	M001324	01-29-21	01-31-23	Pressure	E003511	10-26-21	10-31-22
Flowmeter	E005626	03-09-21	03-31-22	DC Voltage	E003315	01-11-21	01-31-22

November 2, 2021      Date

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

Performance Check ref. No. AS0220624-1      Report Issue Date 24/06/2022  
 Date of performance check 23/06/2022

**Objective:**

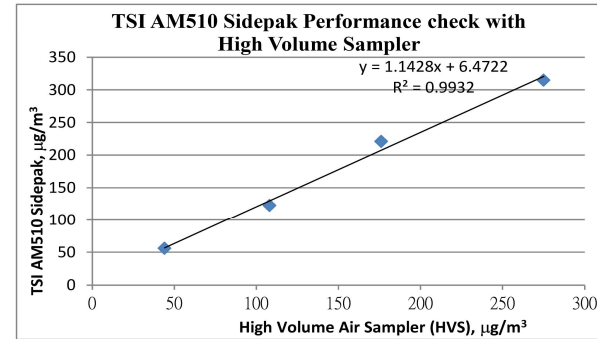
A dust meter and a Total Suspended Particulate High Volume Air Sampler (HVS) were placed together to measure the Total Suspended Particulate (TSP) concentrations simultaneously to check the performance.

**Equipment Used:**

Equipment	Manufacturer and Model	Serial Number
Personal Aerosol Monitor	TSI AM510 Sidepak	11306015
Total Suspended Particulate High Volume Air Sampler	GS2310	10346

**Result:**

Equipment	Measurement Result, µg/m <sup>3</sup>			
TSI AM510 Sidepak	56	123	221	315
High Volume Air Sampler (HVS)	44	108	176	275



Tested by : 24/06/2022  
 Name : ( Ben Poon )

Checked by : 24/06/2022  
 Name : ( Tommy Wong )

Form No. ENV CAL SAMPLER CCI d412/12/2003



# 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	72.48 (22.5) °F (°C)	Serial Number	11506009
Relative Humidity	17.3 %RH		
Barometric Pressure	29.42 (996.3) inHg (hPa)		

As Left       In Tolerance  
 As Found       Out of Tolerance

### Concentration Linearity Plot

System ID: DT1101-02

CONCENTRATION			Unit: mg/m <sup>3</sup>				
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	1.162	1.122	1.046-1.278	3	0.045	0.047	0.031-0.059
2	0.168	0.169	0.143-0.193	4	12.701	12.744	11.431-13.971

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 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	08-30-21	02-28-22
Microbalance	M001324	01-29-21	01-31-23	Pressure	E003511	10-26-21	10-31-22
Flowmeter	E005626	03-09-21	03-31-22	DC Voltage	E003315	01-11-21	01-31-22

November 2, 2021

Calibrated \_\_\_\_\_ Date \_\_\_\_\_

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

Performance Check ref. No. AS0220624-1      Report Issue Date 24/06/2022  
 Date of performance check 23/06/2022

**Objective:**

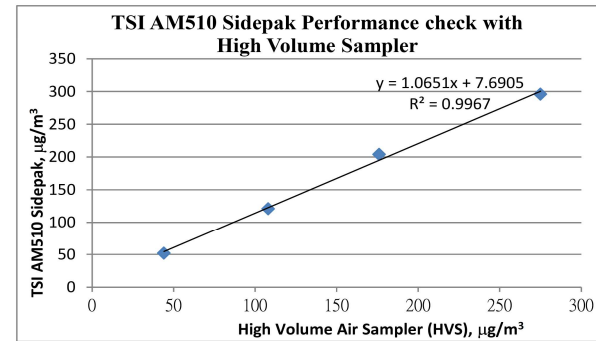
A dust meter and a Total Suspended Particulate High Volume Air Sampler (HVS) were placed together to measure the Total Suspended Particulate (TSP) concentrations simultaneously to check the performance.

**Equipment Used:**

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

**Results:**

Equipment	Measurement Result, µg/m <sup>3</sup>			
TSI AM510 Sidepak	52	121	204	296
High Volume Air Sampler (HVS)	44	108	176	275



Tested by: 24/06/2022      Checked by: 24/06/2022  
 Name: ( Ben Poon )      Name: ( Tommy Wong )

Form No. ENV CAL SAMPLER CCI 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

AAST-WS-04, Cal: 15 Feb 2022

**Calibration Certificate No.: CC0012202**

**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	BD181101023	N/A

**Certificate Information**

Date of Receipt:	10 February 2022	Calibration Condition:	23.6°C, 53%RH, 1008hPa
Date of Calibration:	15 February 2022	Adjustment:	N/A
Due Date of Calibration:	N/A	Appearance:	Good
Calibration Procedure:	JJF 1183-2007, JJF 1076-2001, SOP-116	Remark:	N/A

**Reference Equipment Identification**

Equipment Description	Model	Serial No.	Expiration Date
Platinum resistance thermometer	KPPRHT-A-1	KCI I-1095, KCI P-1095	28 June 2023
Humidity sensor	KPPRHT-A-1	KCI I-1095, KCI P-1095	4 March 2022
Hot Wire Anemometer	9535	T953S1316004	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:

Wing Cheng

Company Chop:



Certificate Issue Date: 16 February 2022

CF-BEG-03

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## 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)	Uncertainty (°C)
15.0	15	0.0	0.3
20.0	20	0.0	0.3
25.0	25	0.0	0.3
30.0	30	0.0	0.3

**Relative Humidity**

Reference reading (%RH)	Reading (%RH)	Error (%RH)	Uncertainty (%RH)
40.0	43	3.0	1.9
50.0	53	3.0	1.9
70.0	72	2.0	1.9

**Wind Speed**

Reference reading (m/s)	Measured reading (m/s)	Error (%)	Uncertainty (%)
0.0	0.0	N/A	3.6
2.0	2.1	5.0	3.6
5.0	5.3	6.0	3.6
8.0	8.2	2.5	3.6

**Wind Direction**

Reference reading	Measured reading	Error	Uncertainty
0°	0°	0°	5°
45°	45°	0°	5°
90°	90°	0°	5°
135°	135°	0°	5°
180°	180°	0°	5°
225°	225°	0°	5°
270°	270°	0°	5°
315°	315°	0°	5°

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

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CC0012202  
Page 2 of 2

# 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

**Calibration Certificate No.: CC0162207**

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

Equipment Description	Manufacturer	Model No.	Serial No.	Assigned equipment No.:
Weather Station	Davis Vantage PRO 2	6312CEU	AY170606003	N/A

Certificate Information		Calibration Condition:	
Date of Receipt:	19 July 2022	24.6°C, 52%RH, 1001hPa	
Date of Calibration:	5 August 2022	Adjustment:	N/A
Due Date of Calibration:	N/A	Appearance:	Good
Calibration Procedure:	JJF 1183-2007, JJF 1076-2001, SOP-116	Remark:	N/A

Reference Equipment Identification			
Equipment Description	Model	Serial No.	Expiration Date
Platinum resistance thermometer	KPPRHT-A-1	KCI I-1095, KCI P-1095	28 June 2023
Humidity sensor	KPPRHT-A-1	KCI I-1095, KCI P-1095	3 March 2023
Hot Wire Anemometer	9535	T95351316004	10 July 2023

Note1: The estimated expanded uncertainties have been calculated in "Evaluation and expression of uncertainty in measurement" and give an internal estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.  
 Note2: The standard (s) and instrument used in the calibration are traceable to national or international recognized standard and are calibrated on a schedule to maintain the accuracy and good condition.  
 Note3: The result reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long term stability of the instrument.  
 Note4: The result shown in this calibration certificate relate only to the item calibrated, and the result only applies to the calibration item as received.

Approved By:

Rex Tse

Company Chop:



Certificate Issue Date: 24 August 2022

CT-06G-03

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**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)	Uncertainty (°C)
15.0	15	0.0	0.3
20.0	20	0.0	0.3
25.0	25	0.0	0.3
30.0	31	1.0	0.3

Relative Humidity			
Reference reading (%RH)	Reading (%RH)	Error (%RH)	Uncertainty (%RH)
40.0	42	2.0	1.9
50.0	52	2.0	1.9
70.0	69	-0.1	1.9

Wind Speed			
Reference reading (m/s)	Measured reading (m/s)	Error (%)	Uncertainty (%)
0.0	0.0	N/A	3.6
2.0	1.9	-5.0	3.6
5.0	5.2	4.0	3.6
8.0	8.2	2.5	3.6

Wind Direction			
Reference reading	Measured reading	Error	Uncertainty
0°	0°	0°	5°
45°	45°	0°	5°
90°	90°	0°	5°
135°	135°	0°	5°
180°	180°	0°	5°
225°	225°	0°	5°
270°	270°	0°	5°
315°	315°	0°	5°

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

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CC0162207  
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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 (%)
01/08/2022	29.1	35.7	0	69
02/08/2022	28	35.2	0.2	70
03/08/2022	25.6	30.8	34.9	82
04/08/2022	25.9	28.4	14.9	86
05/08/2022	24.5	28.6	165.5	94
06/08/2022	26.1	30.9	5.5	89
07/08/2022	27.6	32.6	2.8	82
08/08/2022	26.2	30.9	33.3	87
09/08/2022	25.4	28.5	72	88
10/08/2022	25.8	29.6	49.7	90
11/08/2022	25.5	28.8	12.4	90
12/08/2022	24.9	27.1	76	93
13/08/2022	25.8	32.6	0	81
14/08/2022	26.9	33.3	0	78
15/08/2022	28.1	33.6	0	78
16/08/2022	26.2	33.2	9.1	82
17/08/2022	26.2	32.3	29.8	86
18/08/2022	26.2	30.4	22.1	87
19/08/2022	26.4	32	4.8	85
20/08/2022	26.5	31.9	8.4	83
21/08/2022	26.6	32.9	1.9	84
22/08/2022	28.2	32.9	0	77
23/08/2022	28.6	34.5	0	77
24/08/2022	26.4	34.9	5.5	73
25/08/2022	25	29.8	48.1	85
26/08/2022	27.5	32.9	0.1	80
27/08/2022	27.4	33	0	78
28/08/2022	28.3	34.4	0	80
29/08/2022	28.6	34.6	0	78
30/08/2022	27.9	32.3	13.1	80
31/08/2022	28.1	31.7	4.7	80

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

NOTE2: Trace means rainfall less than 0.08 mm

<https://www.hko.gov.hk/en/cis/dailyExtract.htm?y=2022&m=08>

## Kai Tak Runway Park Information

Date	Absolute Daily Min Temperature (°C)	Absolute Daily Max Temperature (°C)
01/08/2022	28.6	35.0
02/08/2022	25.7	35.8
03/08/2022	24.6	31.5
04/08/2022	25.9	28.5
05/08/2022	24.1	30.9
06/08/2022	25.9	31.5
07/08/2022	27.7	32.5
08/08/2022	26.1	30.6
09/08/2022	25.0	28.6
10/08/2022	25.3	29.5
11/08/2022	25.6	30.2
12/08/2022	24.8	28.1
13/08/2022	25.7	30.8
14/08/2022	26.8	32.7
15/08/2022	27.8	32.7
16/08/2022	25.8	32.7
17/08/2022	26.4	31.3
18/08/2022	26.4	31.5
19/08/2022	26.6	32.3
20/08/2022	26.0	30.7
21/08/2022	27.8	31.4
22/08/2022	27.9	33.8
23/08/2022	28.7	34.7
24/08/2022	25.9	35.0
25/08/2022	24.5	30.0
26/08/2022	27.4	30.3
27/08/2022	27.1	33.7
28/08/2022	28.3	33.2
29/08/2022	28.2	31.5
30/08/2022	26.7	33.4
31/08/2022	28.0	33.3

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=2022-08-01&chart\\_type=DG\\_TEMP](https://i-lens.hk/hkweather/history_chart.php?date=2022-08-01&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
01/08/2022	0:00	0.4	112.5	02/08/2022	0:00	0.4	90	03/08/2022	0:00	1.3	90	04/08/2022	0:00	0.9	135
01/08/2022	1:00	0.9	90	02/08/2022	1:00	0.4	67.5	03/08/2022	1:00	1.3	90	04/08/2022	1:00	0.9	112.5
01/08/2022	2:00	0.9	90	02/08/2022	2:00	0.9	90	03/08/2022	2:00	1.3	90	04/08/2022	2:00	0.4	90
01/08/2022	3:00	0.4	247.5	02/08/2022	3:00	1.3	135	03/08/2022	3:00	1.3	112.5	04/08/2022	3:00	0.4	90
01/08/2022	4:00	0.4	202.5	02/08/2022	4:00	0.9	67.5	03/08/2022	4:00	0.9	112.5	04/08/2022	4:00	0.9	0
01/08/2022	5:00	0.9	90	02/08/2022	5:00	1.3	90	03/08/2022	5:00	0.4	225	04/08/2022	5:00	0.4	45
01/08/2022	6:00	0.9	112.5	02/08/2022	6:00	1.3	90	03/08/2022	6:00	1.3	67.5	04/08/2022	6:00	0.4	67.5
01/08/2022	7:00	0.4	112.5	02/08/2022	7:00	0.9	90	03/08/2022	7:00	0.9	225	04/08/2022	7:00	0.9	112.5
01/08/2022	8:00	0.9	135	02/08/2022	8:00	0.4	90	03/08/2022	8:00	0.9	112.4	04/08/2022	8:00	0.9	135
01/08/2022	9:00	0.4	112.5	02/08/2022	9:00	0.9	45	03/08/2022	9:00	1.3	112.5	04/08/2022	9:00	0.4	112.5
01/08/2022	10:00	0.9	112.5	02/08/2022	10:00	0.4	135	03/08/2022	10:00	0.4	90	04/08/2022	10:00	0.4	292.5
01/08/2022	11:00	0.9	112.5	02/08/2022	11:00	0.4	135	03/08/2022	11:00	0.9	45	04/08/2022	11:00	0.9	112.5
01/08/2022	12:00	1.3	112.5	02/08/2022	12:00	0.4	112.5	03/08/2022	12:00	1.3	90	04/08/2022	12:00	0.4	225
01/08/2022	13:00	0.4	90	02/08/2022	13:00	0.9	22.5	03/08/2022	13:00	1.3	90	04/08/2022	13:00	0.4	315
01/08/2022	14:00	0.4	112.5	02/08/2022	14:00	0.9	90	03/08/2022	14:00	1.3	90	04/08/2022	14:00	0.4	112.5
01/08/2022	15:00	0.4	45	02/08/2022	15:00	0.4	225	03/08/2022	15:00	1.3	90	04/08/2022	15:00	0.4	112.5
01/08/2022	16:00	0.9	135	02/08/2022	16:00	0.4	67.5	03/08/2022	16:00	1.3	90	04/08/2022	16:00	0.9	45
01/08/2022	17:00	0.9	135	02/08/2022	17:00	0.4	135	03/08/2022	17:00	1.3	112.5	04/08/2022	17:00	0.4	67.5
01/08/2022	18:00	0.4	22.5	02/08/2022	18:00	1.3	112.5	03/08/2022	18:00	0.9	112.5	04/08/2022	18:00	0.9	67.5
01/08/2022	19:00	1.3	45	02/08/2022	19:00	0.4	202.5	03/08/2022	19:00	0.4	225	04/08/2022	19:00	0.9	90
01/08/2022	20:00	1.3	45	02/08/2022	20:00	0.9	67.5	03/08/2022	20:00	1.3	67.5	04/08/2022	20:00	0.9	67.5
01/08/2022	21:00	1.3	45	02/08/2022	21:00	0.9	247.5	03/08/2022	21:00	0.9	225	04/08/2022	21:00	0.9	67.5
01/08/2022	22:00	1.3	90	02/08/2022	22:00	1.8	202.5	03/08/2022	22:00	0.9	112.4	04/08/2022	22:00	0.9	135
01/08/2022	23:00	1.3	45	02/08/2022	23:00	0.4	225	03/08/2022	23:00	1.3	112.5	04/08/2022	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
05/08/2022	0:00	0.4	157.5	06/08/2022	0:00	0.9	225	07/08/2022	0:00	0.4	135	08/08/2022	0:00	0.9	112.5
05/08/2022	1:00	0.9	112.5	06/08/2022	1:00	0.9	202.5	07/08/2022	1:00	1.3	135	08/08/2022	1:00	0.9	112.5
05/08/2022	2:00	0.4	112.5	06/08/2022	2:00	0.9	112.5	07/08/2022	2:00	0.4	135	08/08/2022	2:00	0.4	112.5
05/08/2022	3:00	0.9	90	06/08/2022	3:00	0.9	225	07/08/2022	3:00	0.9	247.5	08/08/2022	3:00	0.4	112.5
05/08/2022	4:00	1.3	90	06/08/2022	4:00	0.4	202.5	07/08/2022	4:00	0.9	202.5	08/08/2022	4:00	0.9	112.5
05/08/2022	5:00	1.3	112.5	06/08/2022	5:00	0.4	157.5	07/08/2022	5:00	0.9	45	08/08/2022	5:00	0.9	112.5
05/08/2022	6:00	1.8	67.5	06/08/2022	6:00	0.4	90	07/08/2022	6:00	0.4	90	08/08/2022	6:00	0.9	22.5
05/08/2022	7:00	1.8	112.5	06/08/2022	7:00	0.4	90	07/08/2022	7:00	0.4	112.5	08/08/2022	7:00	0.4	67.5
05/08/2022	8:00	0.4	112.5	06/08/2022	8:00	0.4	112.5	07/08/2022	8:00	0.9	112.5	08/08/2022	8:00	1.3	337.5
05/08/2022	9:00	0.9	112.5	06/08/2022	9:00	0.9	225	07/08/2022	9:00	0.9	112.5	08/08/2022	9:00	0.9	112.5
05/08/2022	10:00	0.9	112.5	06/08/2022	10:00	0.9	202.5	07/08/2022	10:00	0.9	112.5	08/08/2022	10:00	0.9	112.5
05/08/2022	11:00	0.9	112.5	06/08/2022	11:00	0.9	112.5	07/08/2022	11:00	0.9	157.5	08/08/2022	11:00	0.4	112.5
05/08/2022	12:00	0.4	157.5	06/08/2022	12:00	0.9	135	07/08/2022	12:00	0.9	157.5	08/08/2022	12:00	1.3	67.5
05/08/2022	13:00	0.4	135	06/08/2022	13:00	0.9	90	07/08/2022	13:00	0.9	180	08/08/2022	13:00	1.3	112.5
05/08/2022	14:00	0.4	135	06/08/2022	14:00	1.3	90	07/08/2022	14:00	0.9	112.5	08/08/2022	14:00	1.3	90
05/08/2022	15:00	0.4	112.5	06/08/2022	15:00	1.8	112.	07/08/2022	15:00	0.9	112.5	08/08/2022	15:00	0.4	112.5
05/08/2022	16:00	0.9	135	06/08/2022	16:00	0.9	90	07/08/2022	16:00	0.4	112.5	08/08/2022	16:00	0.4	112.5
05/08/2022	17:00	0.9	112.5	06/08/2022	17:00	0.4	112.5	07/08/2022	17:00	0.4	112.5	08/08/2022	17:00	0.4	135
05/08/2022	18:00	0.9	112.5	06/08/2022	18:00	0.9	135	07/08/2022	18:00	0.9	112.5	08/08/2022	18:00	0.4	135
05/08/2022	19:00	0.4	135	06/08/2022	19:00	0.4	135	07/08/2022	19:00	0.9	112.5	08/08/2022	19:00	0.4	112.5
05/08/2022	20:00	0.4	337.5	06/08/2022	20:00	0.4	135	07/08/2022	20:00	0.9	22.5	08/08/2022	20:00	0.4	135
05/08/2022	21:00	0.4	112.5	06/08/2022	21:00	0.4	157.5	07/08/2022	21:00	0.4	67.5	08/08/2022	21:00	0.9	135
05/08/2022	22:00	0.9	112.5	06/08/2022	22:00	1.3	90	07/08/2022	22:00	1.3	337.5	08/08/2022	22:00	0.4	112.5
05/08/2022	23:00	0.9	112.5	06/08/2022	23:00	0.9	90	07/08/2022	23:00	0.9	112.5	08/08/2022	23:00	1.3	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
09/08/2022	0:00	2.2	112.5	10/08/2022	0:00	1.3	90	11/08/2022	0:00	0.9	112.5	12/08/2022	0:00	1.3	112.5
09/08/2022	1:00	1.8	45	10/08/2022	1:00	1.8	112.5	11/08/2022	1:00	1.8	112.5	12/08/2022	1:00	0.9	135
09/08/2022	2:00	2.2	90	10/08/2022	2:00	0.9	67.5	11/08/2022	2:00	0.9	90	12/08/2022	2:00	0.9	67.5
09/08/2022	3:00	2.2	90	10/08/2022	3:00	0.9	112.5	11/08/2022	3:00	0.9	112.5	12/08/2022	3:00	0.9	45
09/08/2022	4:00	1.3	67.5	10/08/2022	4:00	0.9	112.5	11/08/2022	4:00	0.9	90	12/08/2022	4:00	0.9	90
09/08/2022	5:00	1.8	45	10/08/2022	5:00	0.4	90	11/08/2022	5:00	1.3	112.5	12/08/2022	5:00	1.8	45
09/08/2022	6:00	1.3	112.5	10/08/2022	6:00	0.9	90	11/08/2022	6:00	1.3	112.5	12/08/2022	6:00	1.8	112.5
09/08/2022	7:00	0.9	112.5	10/08/2022	7:00	0.9	112.5	11/08/2022	7:00	1.3	90	12/08/2022	7:00	1.3	112.5
09/08/2022	8:00	0.4	112.5	10/08/2022	8:00	0.9	225	11/08/2022	8:00	1.3	112.5	12/08/2022	8:00	1.3	112.5
09/08/2022	9:00	0.4	112.5	10/08/2022	9:00	1.8	112.5	11/08/2022	9:00	1.8	112.5	12/08/2022	9:00	1.3	135
09/08/2022	10:00	2.2	112.5	10/08/2022	10:00	1.3	45	11/08/2022	10:00	1.3	112.5	12/08/2022	10:00	1.3	112.5
09/08/2022	11:00	1.8	45	10/08/2022	11:00	1.3	112.5	11/08/2022	11:00	1.8	112.5	12/08/2022	11:00	0.9	135
09/08/2022	12:00	2.2	90	10/08/2022	12:00	1.3	90	11/08/2022	12:00	1.3	112.5	12/08/2022	12:00	0.9	67.5
09/08/2022	13:00	2.2	112.5	10/08/2022	13:00	1.8	112.5	11/08/2022	13:00	1.8	45	12/08/2022	13:00	0.9	45
09/08/2022	14:00	1.8	45	10/08/2022	14:00	1.3	247.5	11/08/2022	14:00	1.3	337.5	12/08/2022	14:00	1.3	247.5
09/08/2022	15:00	2.2	90	10/08/2022	15:00	0.9	247.5	11/08/2022	15:00	0.9	112.5	12/08/2022	15:00	0.9	247.5
09/08/2022	16:00	2.2	90	10/08/2022	16:00	1.3	247.5	11/08/2022	16:00	1.3	112.5	12/08/2022	16:00	1.3	247.5
09/08/2022	17:00	1.3	67.5	10/08/2022	17:00	1.3	247.5	11/08/2022	17:00	1.3	112.5	12/08/2022	17:00	1.3	247.5
09/08/2022	18:00	1.8	45	10/08/2022	18:00	1.8	247.5	11/08/2022	18:00	1.3	67.5	12/08/2022	18:00	1.8	247.5
09/08/2022	19:00	1.3	112.5	10/08/2022	19:00	1.3	112.5	11/08/2022	19:00	0.9	135	12/08/2022	19:00	1.3	112.5
09/08/2022	20:00	0.9	112.5	10/08/2022	20:00	1.3	112.5	11/08/2022	20:00	1.3	112.5	12/08/2022	20:00	1.3	112.5
09/08/2022	21:00	0.4	112.5	10/08/2022	21:00	0.4	112.5	11/08/2022	21:00	0.9	90	12/08/2022	21:00	0.4	112.5
09/08/2022	22:00	0.4	112.5	10/08/2022	22:00	0.4	112.5	11/08/2022	22:00	1.3	90	12/08/2022	22:00	0.4	112.5
09/08/2022	23:00	2.2	112.5	10/08/2022	23:00	0.9	90	11/08/2022	23:00	1.8	45	12/08/2022	23:00	0.9	90

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
13/08/2022	0:00	1.3	90	14/08/2022	0:00	0.9	135	15/08/2022	0:00	1.3	90	16/08/2022	0:00	0.4	112.5
13/08/2022	1:00	0.9	112.5	14/08/2022	1:00	1.3	90	15/08/2022	1:00	0.9	90	16/08/2022	1:00	0.4	112.5
13/08/2022	2:00	0.4	112.5	14/08/2022	2:00	0.4	90	15/08/2022	2:00	1.3	45	16/08/2022	2:00	0.9	112.5
13/08/2022	3:00	0.4	112.5	14/08/2022	3:00	1.3	135	15/08/2022	3:00	1.3	135	16/08/2022	3:00	0.4	90
13/08/2022	4:00	1.3	90	14/08/2022	4:00	0.9	135	15/08/2022	4:00	1.3	135	16/08/2022	4:00	0.4	112.5
13/08/2022	5:00	0.9	135	14/08/2022	5:00	0.4	135	15/08/2022	5:00	1.8	90	16/08/2022	5:00	0.4	112.5
13/08/2022	6:00	0.9	90	14/08/2022	6:00	0.4	90	15/08/2022	6:00	1.8	135	16/08/2022	6:00	0.4	90
13/08/2022	7:00	0.9	45	14/08/2022	7:00	1.3	135	15/08/2022	7:00	1.3	135	16/08/2022	7:00	0.9	90
13/08/2022	8:00	0.4	112.5	14/08/2022	8:00	1.3	135	15/08/2022	8:00	1.8	67.5	16/08/2022	8:00	0.9	112.5
13/08/2022	9:00	0.4	157.5	14/08/2022	9:00	0.4	135	15/08/2022	9:00	0.9	90	16/08/2022	9:00	0.4	135
13/08/2022	10:00	0.4	67.5	14/08/2022	10:00	0.9	45	15/08/2022	10:00	1.8	225	16/08/2022	10:00	0.4	135
13/08/2022	11:00	0.4	157.5	14/08/2022	11:00	1.3	45	15/08/2022	11:00	1.3	67.5	16/08/2022	11:00	0.4	112.5
13/08/2022	12:00	0.4	112.5	14/08/2022	12:00	1.3	292.5	15/08/2022	12:00	0.9	22.5	16/08/2022	12:00	0.4	112.5
13/08/2022	13:00	0.9	67.5	14/08/2022	13:00	0.4	292.5	15/08/2022	13:00	0.4	292.5	16/08/2022	13:00	0.4	112.5
13/08/2022	14:00	1.3	90	14/08/2022	14:00	1.3	112.5	15/08/2022	14:00	0	90	16/08/2022	14:00	0.9	90
13/08/2022	15:00	0.9	112.5	14/08/2022	15:00	0.9	90	15/08/2022	15:00	0.4	112.5	16/08/2022	15:00	0.9	90
13/08/2022	16:00	1.3	112.5	14/08/2022	16:00	0.9	135	15/08/2022	16:00	0.9	112.5	16/08/2022	16:00	0.9	67.5
13/08/2022	17:00	1.3	67.5	14/08/2022	17:00	0.9	112.5	15/08/2022	17:00	0.9	135	16/08/2022	17:00	0.9	67.5
13/08/2022	18:00	1.3	90	14/08/2022	18:00	0.9	112.5	15/08/2022	18:00	0.9	90	16/08/2022	18:00	0.4	135
13/08/2022	19:00	1.8	112.5	14/08/2022	19:00	0.4	112.5	15/08/2022	19:00	0.9	45	16/08/2022	19:00	0.9	90
13/08/2022	20:00	1.8	67.5	14/08/2022	20:00	0.9	67.5	15/08/2022	20:00	0.9	45	16/08/2022	20:00	0.9	112.5
13/08/2022	21:00	1.3	22.5	14/08/2022	21:00	1.3	45	15/08/2022	21:00	0.4	135	16/08/2022	21:00	0.9	135
13/08/2022	22:00	0.4	135	14/08/2022	22:00	1.3	22.5	15/08/2022	22:00	0.9	135	16/08/2022	22:00	0.4	112.5
13/08/2022	23:00	0.9	22.5	14/08/2022	23:00	1.3	90	15/08/2022	23:00	0.4	112.5	16/08/2022	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
17/08/2022	0:00	1.3	45	18/08/2022	0:00	0.4	22.5	19/08/2022	0:00	1.3	90	20/08/2022	0:00	0.9	270
17/08/2022	1:00	1.3	135	18/08/2022	1:00	0.9	67.5	19/08/2022	1:00	1.3	45	20/08/2022	1:00	0.4	225
17/08/2022	2:00	0.9	90	18/08/2022	2:00	0.9	67.5	19/08/2022	2:00	0.4	135	20/08/2022	2:00	0.9	225
17/08/2022	3:00	0.9	45	18/08/2022	3:00	0.9	45	19/08/2022	3:00	0.4	67.5	20/08/2022	3:00	0.9	292.5
17/08/2022	4:00	1.3	67.5	18/08/2022	4:00	1.3	67.5	19/08/2022	4:00	0.9	90	20/08/2022	4:00	0.9	247.5
17/08/2022	5:00	0.9	112.5	18/08/2022	5:00	0.4	45	19/08/2022	5:00	1.3	90	20/08/2022	5:00	0.9	270
17/08/2022	6:00	0.9	90	18/08/2022	6:00	0.9	135	19/08/2022	6:00	1.3	90	20/08/2022	6:00	0.9	270
17/08/2022	7:00	1.3	112.5	18/08/2022	7:00	0.9	135	19/08/2022	7:00	1.3	112.5	20/08/2022	7:00	0.9	67.5
17/08/2022	8:00	1.8	135	18/08/2022	8:00	0.4	22.5	19/08/2022	8:00	1.3	135	20/08/2022	8:00	0.9	67.5
17/08/2022	9:00	1.8	337.5	18/08/2022	9:00	1.3	45	19/08/2022	9:00	0.9	90	20/08/2022	9:00	0.9	112.5
17/08/2022	10:00	1.3	90	18/08/2022	10:00	0.4	22.5	19/08/2022	10:00	0.9	112.5	20/08/2022	10:00	0.9	90
17/08/2022	11:00	1.3	22.5	18/08/2022	11:00	0.9	67.5	19/08/2022	11:00	0.9	90	20/08/2022	11:00	0.9	270
17/08/2022	12:00	1.3	45	18/08/2022	12:00	0.9	67.5	19/08/2022	12:00	1.3	90	20/08/2022	12:00	0.4	225
17/08/2022	13:00	0.9	45	18/08/2022	13:00	0.9	337.5	19/08/2022	13:00	0.9	247.5	20/08/2022	13:00	1.3	45
17/08/2022	14:00	0.9	45	18/08/2022	14:00	0.4	337.5	19/08/2022	14:00	1.3	112.5	20/08/2022	14:00	1.3	45
17/08/2022	15:00	1.3	45	18/08/2022	15:00	0.4	22.5	19/08/2022	15:00	0.9	45	20/08/2022	15:00	1.3	225
17/08/2022	16:00	0.4	45	18/08/2022	16:00	0.9	22.5	19/08/2022	16:00	0.9	67.5	20/08/2022	16:00	1.3	270
17/08/2022	17:00	0.9	247.5	18/08/2022	17:00	0.4	22.5	19/08/2022	17:00	0.4	67.5	20/08/2022	17:00	0.9	112.5
17/08/2022	18:00	0.9	22.5	18/08/2022	18:00	0.4	0	19/08/2022	18:00	0.4	67.5	20/08/2022	18:00	0.9	112.5
17/08/2022	19:00	1.3	22.5	18/08/2022	19:00	0.4	0	19/08/2022	19:00	0.9	67.5	20/08/2022	19:00	1.3	112.5
17/08/2022	20:00	1.3	45	18/08/2022	20:00	0.4	202.5	19/08/2022	20:00	0.9	112.5	20/08/2022	20:00	1.3	112.5
17/08/2022	21:00	0.4	67.5	18/08/2022	21:00	0.4	315	19/08/2022	21:00	0.4	112.5	20/08/2022	21:00	1.3	112.5
17/08/2022	22:00	0.4	135	18/08/2022	22:00	0.4	270	19/08/2022	22:00	0.4	90	20/08/2022	22:00	0.9	112.5
17/08/2022	23:00	0.4	202.5	18/08/2022	23:00	0.9	337.5	19/08/2022	23:00	0.9	247.5	20/08/2022	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
21/08/2022	0:00	1.3	112.5	22/08/2022	0:00	0.4	67.5	23/08/2022	0:00	1.8	67.5	24/08/2022	0:00	1.3	45
21/08/2022	1:00	1.3	90	22/08/2022	1:00	0.4	45	23/08/2022	1:00	1.8	45	24/08/2022	1:00	1.3	67.5
21/08/2022	2:00	1.8	112.5	22/08/2022	2:00	0.4	112.5	23/08/2022	2:00	1.3	45	24/08/2022	2:00	1.8	45
21/08/2022	3:00	1.3	112.5	22/08/2022	3:00	0.4	180	23/08/2022	3:00	1.3	67.5	24/08/2022	3:00	1.3	45
21/08/2022	4:00	1.3	112.5	22/08/2022	4:00	0.4	270	23/08/2022	4:00	1.8	157.5	24/08/2022	4:00	1.3	67.5
21/08/2022	5:00	0.4	112.5	22/08/2022	5:00	0.4	45	23/08/2022	5:00	1.8	67.5	24/08/2022	5:00	1.3	45
21/08/2022	6:00	0.4	112.5	22/08/2022	6:00	0.9	45	23/08/2022	6:00	1.8	67.5	24/08/2022	6:00	1.3	45
21/08/2022	7:00	0.4	112.5	22/08/2022	7:00	0.9	90	23/08/2022	7:00	1.8	90	24/08/2022	7:00	1.3	225
21/08/2022	8:00	0.4	112.5	22/08/2022	8:00	0.4	45	23/08/2022	8:00	1.3	112.5	24/08/2022	8:00	1.3	270
21/08/2022	9:00	0.4	112.5	22/08/2022	9:00	0.4	135	23/08/2022	9:00	0.4	90	24/08/2022	9:00	0.9	112.5
21/08/2022	10:00	0.9	112.5	22/08/2022	10:00	0.9	247.5	23/08/2022	10:00	1.8	67.5	24/08/2022	10:00	0.9	112.5
21/08/2022	11:00	0.9	112.5	22/08/2022	11:00	0.4	67.5	23/08/2022	11:00	1.8	45	24/08/2022	11:00	1.3	112.5
21/08/2022	12:00	1.3	112.5	22/08/2022	12:00	0.9	90	23/08/2022	12:00	1.3	45	24/08/2022	12:00	1.3	112.5
21/08/2022	13:00	1.3	90	22/08/2022	13:00	1.3	90	23/08/2022	13:00	1.3	67.5	24/08/2022	13:00	1.3	45
21/08/2022	14:00	1.8	112.5	22/08/2022	14:00	0.9	112.5	23/08/2022	14:00	1.3	112.5	24/08/2022	14:00	1.3	45
21/08/2022	15:00	0.9	90	22/08/2022	15:00	0.9	22.5	23/08/2022	15:00	1.3	90	24/08/2022	15:00	1.3	67.5
21/08/2022	16:00	0.9	67.5	22/08/2022	16:00	1.3	112.5	23/08/2022	16:00	1.3	67.5	24/08/2022	16:00	1.8	45
21/08/2022	17:00	0.9	90	22/08/2022	17:00	1.3	135	23/08/2022	17:00	1.3	112.5	24/08/2022	17:00	1.3	45
21/08/2022	18:00	0.9	22.5	22/08/2022	18:00	1.3	112.5	23/08/2022	18:00	1.8	67.5	24/08/2022	18:00	1.3	67.5
21/08/2022	19:00	0.4	90	22/08/2022	19:00	1.3	112.5	23/08/2022	19:00	1.3	67.5	24/08/2022	19:00	1.3	45
21/08/2022	20:00	0.4	67.5	22/08/2022	20:00	0.9	135	23/08/2022	20:00	0.9	67.5	24/08/2022	20:00	1.3	45
21/08/2022	21:00	0.4	90	22/08/2022	21:00	1.3	90	23/08/2022	21:00	0.9	67.5	24/08/2022	21:00	1.3	225
21/08/2022	22:00	0.4	112.5	22/08/2022	22:00	1.3	112.5	23/08/2022	22:00	1.8	22.5	24/08/2022	22:00	1.3	270
21/08/2022	23:00	0.9	45	22/08/2022	23:00	1.3	112.5	23/08/2022	23:00	1.3	112.5	24/08/2022	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
25/08/2022	0:00	2.2	112.5	26/08/2022	0:00	0.4	112.5	27/08/2022	0:00	1.3	67.5	28/08/2022	0:00	0.9	112.5
25/08/2022	1:00	2.2	90	26/08/2022	1:00	0.9	270	27/08/2022	1:00	0.9	112.5	28/08/2022	1:00	0.4	112.5
25/08/2022	2:00	2.7	112.5	26/08/2022	2:00	0.4	157.5	27/08/2022	2:00	0.9	135	28/08/2022	2:00	0.9	112.5
25/08/2022	3:00	2.7	90	26/08/2022	3:00	0.9	157.5	27/08/2022	3:00	0.9	315	28/08/2022	3:00	0.9	112.5
25/08/2022	4:00	2.7	90	26/08/2022	4:00	1.3	90	27/08/2022	4:00	0.9	135	28/08/2022	4:00	0.4	112.5
25/08/2022	5:00	2.2	90	26/08/2022	5:00	1.3	45	27/08/2022	5:00	1.3	90	28/08/2022	5:00	0.4	112.5
25/08/2022	6:00	1.8	112.5	26/08/2022	6:00	1.8	67.5	27/08/2022	6:00	0.9	67.5	28/08/2022	6:00	0.4	135
25/08/2022	7:00	2.2	67.5	26/08/2022	7:00	1.8	202.5	27/08/2022	7:00	1.3	90	28/08/2022	7:00	0.9	112.5
25/08/2022	8:00	2.7	292.5	26/08/2022	8:00	0.9	45	27/08/2022	8:00	1.3	112.5	28/08/2022	8:00	0.4	135
25/08/2022	9:00	1.3	112.5	26/08/2022	9:00	1.3	112.5	27/08/2022	9:00	0.9	90	28/08/2022	9:00	0.9	135
25/08/2022	10:00	1.3	90	26/08/2022	10:00	0.9	135	27/08/2022	10:00	1.3	112.5	28/08/2022	10:00	0.4	135
25/08/2022	11:00	1.8	112.5	26/08/2022	11:00	0.9	90	27/08/2022	11:00	0.9	90	28/08/2022	11:00	0.9	112.5
25/08/2022	12:00	1.3	90	26/08/2022	12:00	1.3	45	27/08/2022	12:00	1.3	67.5	28/08/2022	12:00	0.4	112.5
25/08/2022	13:00	2.7	90	26/08/2022	13:00	1.3	90	27/08/2022	13:00	0.9	112.5	28/08/2022	13:00	0.9	112.5
25/08/2022	14:00	0.9	135	26/08/2022	14:00	1.8	22.5	27/08/2022	14:00	1.3	0	28/08/2022	14:00	1.8	45
25/08/2022	15:00	0.9	112.5	26/08/2022	15:00	1.8	315	27/08/2022	15:00	0.9	22.5	28/08/2022	15:00	1.3	67.5
25/08/2022	16:00	0.9	112.5	26/08/2022	16:00	1.3	90	27/08/2022	16:00	0.4	337.5	28/08/2022	16:00	1.3	67.5
25/08/2022	17:00	1.3	135	26/08/2022	17:00	1.3	90	27/08/2022	17:00	1.3	22.5	28/08/2022	17:00	1.3	67.5
25/08/2022	18:00	0.9	135	26/08/2022	18:00	0.9	112.5	27/08/2022	18:00	0.4	22.5	28/08/2022	18:00	1.8	45
25/08/2022	19:00	0.9	112.5	26/08/2022	19:00	0.4	112.5	27/08/2022	19:00	0.4	292.5	28/08/2022	19:00	1.3	67.5
25/08/2022	20:00	0.9	135	26/08/2022	20:00	1.3	45	27/08/2022	20:00	0.4	0	28/08/2022	20:00	0.9	112.5
25/08/2022	21:00	0.9	112.5	26/08/2022	21:00	1.3	0	27/08/2022	21:00	0.4	337.5	28/08/2022	21:00	0.4	135
25/08/2022	22:00	2.2	112.5	26/08/2022	22:00	0.4	22.5	27/08/2022	22:00	0.4	337.5	28/08/2022	22:00	0.9	135
25/08/2022	23:00	1.3	90	26/08/2022	23:00	1.3	67.5	27/08/2022	23:00	0.4	247.5	28/08/2022	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
29/08/2022	0:00	0.9	90	30/08/2022	0:00	0.9	67.5	31/08/2022	0:00	0.4	112.5				
29/08/2022	1:00	1.3	90	30/08/2022	1:00	0.9	90	31/08/2022	1:00	0.4	157.5				
29/08/2022	2:00	1.3	45	30/08/2022	2:00	0.4	90	31/08/2022	2:00	0.4	112.5				
29/08/2022	3:00	1.3	0	30/08/2022	3:00	0.4	157.5	31/08/2022	3:00	0.4	112.5				
29/08/2022	4:00	0.9	22.5	30/08/2022	4:00	0.9	112.5	31/08/2022	4:00	0.4	180				
29/08/2022	5:00	0.9	0	30/08/2022	5:00	0.4	112.5	31/08/2022	5:00	0.4	112.5				
29/08/2022	6:00	0.9	22.5	30/08/2022	6:00	0.4	90	31/08/2022	6:00	0.4	270				
29/08/2022	7:00	0.9	22.5	30/08/2022	7:00	0.4	112.5	31/08/2022	7:00	0.9	112.5				
29/08/2022	8:00	0.4	315	30/08/2022	8:00	0.9	135	31/08/2022	8:00	0.4	112.5				
29/08/2022	9:00	0.9	112.5	30/08/2022	9:00	1.3	157.5	31/08/2022	9:00	0.9	90				
29/08/2022	10:00	1.8	90	30/08/2022	10:00	1.3	112.5	31/08/2022	10:00	0.9	90				
29/08/2022	11:00	1.8	135	30/08/2022	11:00	1.3	112.5	31/08/2022	11:00	0.4	90				
29/08/2022	12:00	0.9	67.5	30/08/2022	12:00	1.3	157.5	31/08/2022	12:00	0.9	67.5				
29/08/2022	13:00	0.9	90	30/08/2022	13:00	0.9	67.5	31/08/2022	13:00	0.4	112.5				
29/08/2022	14:00	0.4	90	30/08/2022	14:00	0.9	90	31/08/2022	14:00	0.4	90				
29/08/2022	15:00	0.4	157.5	30/08/2022	15:00	0.4	90	31/08/2022	15:00	0.9	90				
29/08/2022	16:00	0.9	112.5	30/08/2022	16:00	0.4	157.5	31/08/2022	16:00	0.4	90				
29/08/2022	17:00	0.4	112.5	30/08/2022	17:00	0.9	112.5	31/08/2022	17:00	0.4	112.5				
29/08/2022	18:00	0.4	90	30/08/2022	18:00	0.4	112.5	31/08/2022	18:00	0.9	90				
29/08/2022	19:00	0.4	112.5	30/08/2022	19:00	0.4	90	31/08/2022	19:00	0.4	90				
29/08/2022	20:00	0.9	135	30/08/2022	20:00	0.4	112.5	31/08/2022	20:00	0.4	90				
29/08/2022	21:00	1.3	157.5	30/08/2022	21:00	0.9	135	31/08/2022	21:00	0.4	90				
29/08/2022	22:00	1.3	112.5	30/08/2022	22:00	1.3	157.5	31/08/2022	22:00	0.9	67.5				
29/08/2022	23:00	1.3	112.5	30/08/2022	23:00	1.3	112.5	31/08/2022	23:00	0.4	90				

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

Location: AM2(A) – Ng Wah Catholic Secondary School

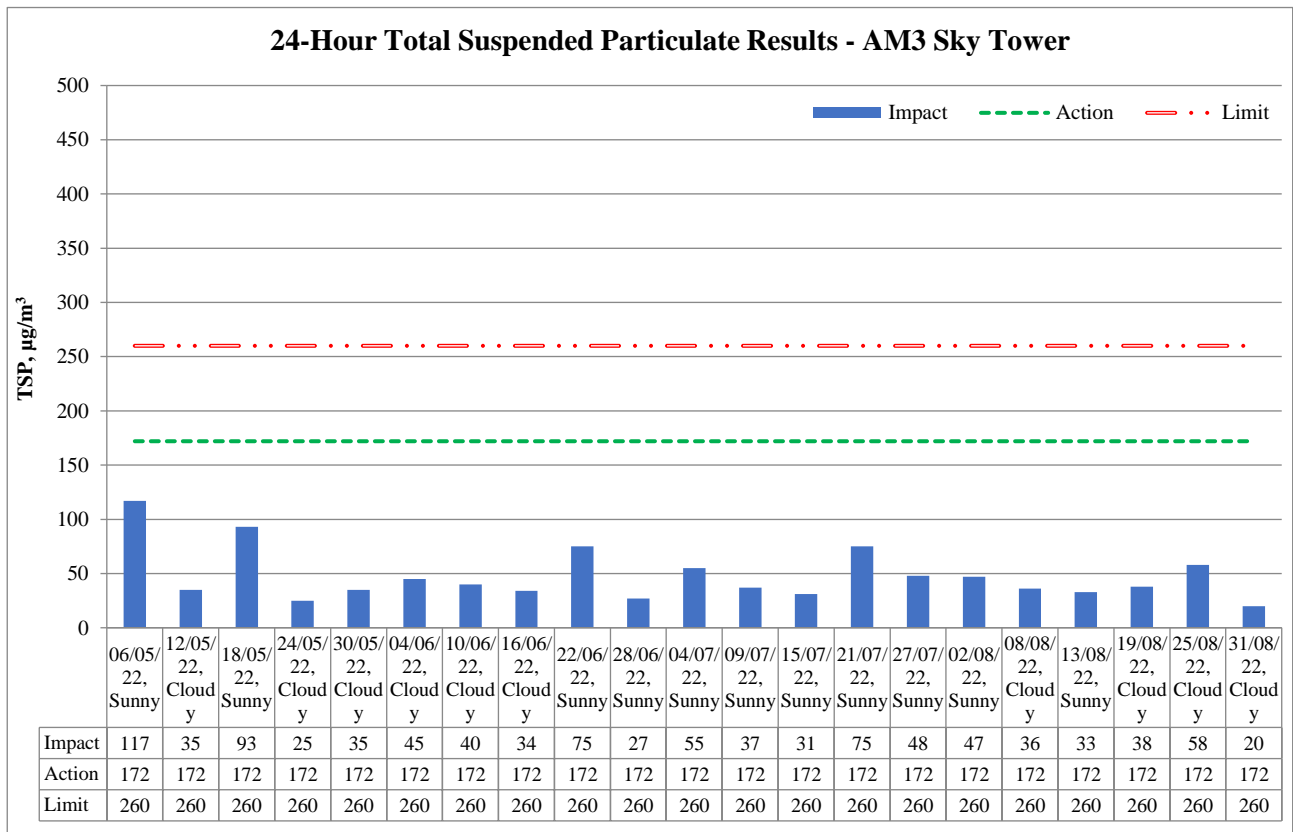
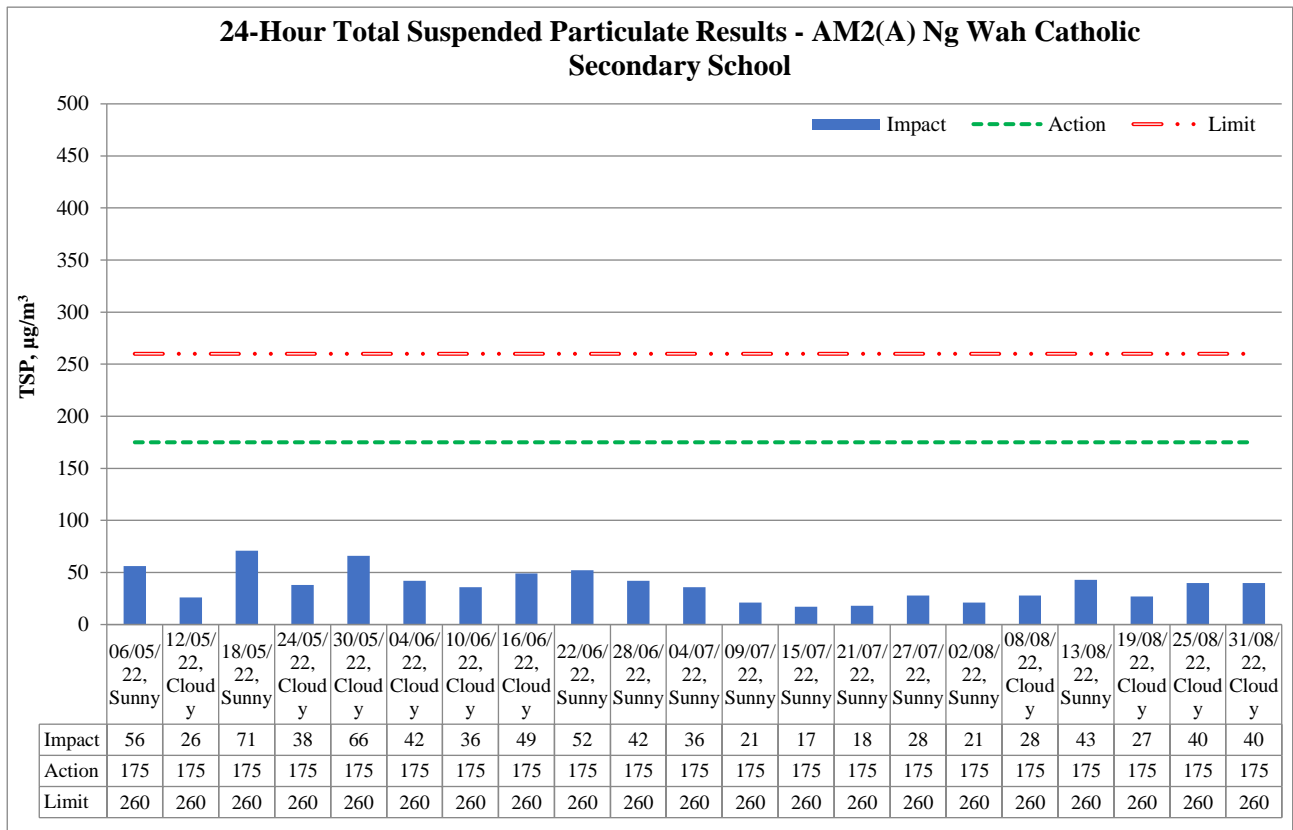
Start Date	Weather	Air Temp. (°C)	Atmospheric Pressure (hPa)	Filter weight (g)		Particulate weight (g)	Elapse Time		Sampling Time (min)	Flow Rate (cfm)		Av. Flow (m <sup>3</sup> /min)	Total vol. (m <sup>3</sup> )	Conc. (µg/m <sup>3</sup> )
				Initial	Final		Initial	Final		Initial	Final			
02/08/2022	Sunny	35.8	1007.1	17.9683	18.0119	0.0436	2022/8/2 13:05	2022/8/3 13:05	1440	50	50	1.41	2037	21
08/08/2022	Cloudy	25.8	1006.3	15.2118	15.2695	0.0577	2022/8/8 13:10	2022/8/9 13:10	1440	50	50	1.44	2071	28
13/08/2022	Sunny	30.8	1008	17.9394	18.0287	0.0893	2022/8/13 9:00	2022/8/14 9:00	1440	50	50	1.43	2055	43
19/08/2022	Cloudy	27.7	1004.9	15.0041	15.0597	0.0556	2022/8/19 9:05	2022/8/20 9:05	1440	50	50	1.43	2063	27
25/08/2022	Cloudy	30.0	1006.3	15.0145	15.0976	0.0831	2022/8/25 13:05	2022/8/26 13:05	1440	50	50	1.43	2056	40
31/08/2022	Cloudy	33.3	1006.7	15.0942	15.1722	0.0780	2022/8/31 9:05	2022/9/1 9:05	1440	50	50	1.34	1929	40
												Maximum	43	
												Minimum	21	
												Average	33	
												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			
02/08/2022	Sunny	35.8	1007.1	18.1004	18.1902	0.0898	2022/8/2 9:11	2022/8/3 9:11	1440	50	50	1.31	1891	47
08/08/2022	Cloudy	25.8	1006.3	18.0228	18.0926	0.0698	2022/8/8 13:30	2022/8/9 13:30	1440	50	50	1.34	1923	36
13/08/2022	Sunny	30.8	1008	14.7346	14.7969	0.0623	2022/8/13 13:14	2022/8/14 13:14	1440	50	50	1.33	1908	33
19/08/2022	Cloudy	27.7	1004.9	17.7123	17.7850	0.0727	2022/8/19 9:18	2022/8/20 9:18	1440	50	50	1.33	1915	38
25/08/2022	Cloudy	30.0	1006.3	14.7855	14.8867	0.1012	2022/8/25 11:17	2022/8/26 11:17	1440	46	46	1.22	1752	58
31/08/2022	Cloudy	33.3	1006.7	17.8203	17.8549	0.0346	2022/8/31 9:25	2022/9/1 9:25	1440	46	46	1.20	1728	20
												Maximum	58	
												Minimum	20	
												Average	39	
												Action Level	175	
												Limit Level	260	

**24-hour average TSP**



Major Construction Activities	Reporting Period			
	May 2022	June 2022	July 2022	August 2022
Construction of Crowd Dispersal Route	✓			
Construction of DCS	✓	✓	✓	✓
Construction works for Road L16	✓	✓	✓	✓
Renovation works for existing subways KS9 and KS32	✓	✓	✓	
Pile cap construction for PC9 and PC10 for Elevated Walkway LW-02	✓			
Pile column construction for PC9 and PC10 for Elevated Walkway LW-02		✓	✓	
Pile column construction for PC9, PC10 and PC11 for Elevated Walkway LW-02				✓
Construction works for Pedestrian Street No. 1, No. 2, No. 3 & No. 4	✓			
Erection of temporary decking across existing Kai Tak River	✓	✓	✓	
ELS and excavation for Subway KS10 Lift and Staircase	✓	✓	✓	
Demolition works to existing subway KS10 staircase and ramp	✓			
Road diversion works at Sa Po Road	✓			
ELS and excavation at launching shaft for subway SB-01	✓			
ELS and excavation for PC11 for Elevated Walkway LW-02		✓	✓	
Trial pit excavation and UU diversion at Sa Po Road under TTA Stage 2		✓	✓	
ELS, excavation and RC construction at launching shaft for subway SB-01		✓	✓	
Construction works for Pedestrian Street No. 2 & No. 4		✓	✓	
RC construction at Launching Shaft for SB-01			✓	
Twin rising main connection works			✓	
Erection of falseworks and working platform for decking of Elevated Walkway LW-02				✓
UU diversion at Sa Po Road under TTA Stage 2A				✓
Sheetpile installation at Sa Po Road under TTA Stage 2A				✓
RC construction at launching shaft for subway SB-01				✓
Construction works for Pedestrian Street No. 2				✓
RC construction for Subway KS10 Lift and Staircase				✓
Renovation works for existing subways KS9 and KS32				✓

Factors might affect the monitoring results	Reporting Period			
	May 2022	June 2022	July 2022	August 2022
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**

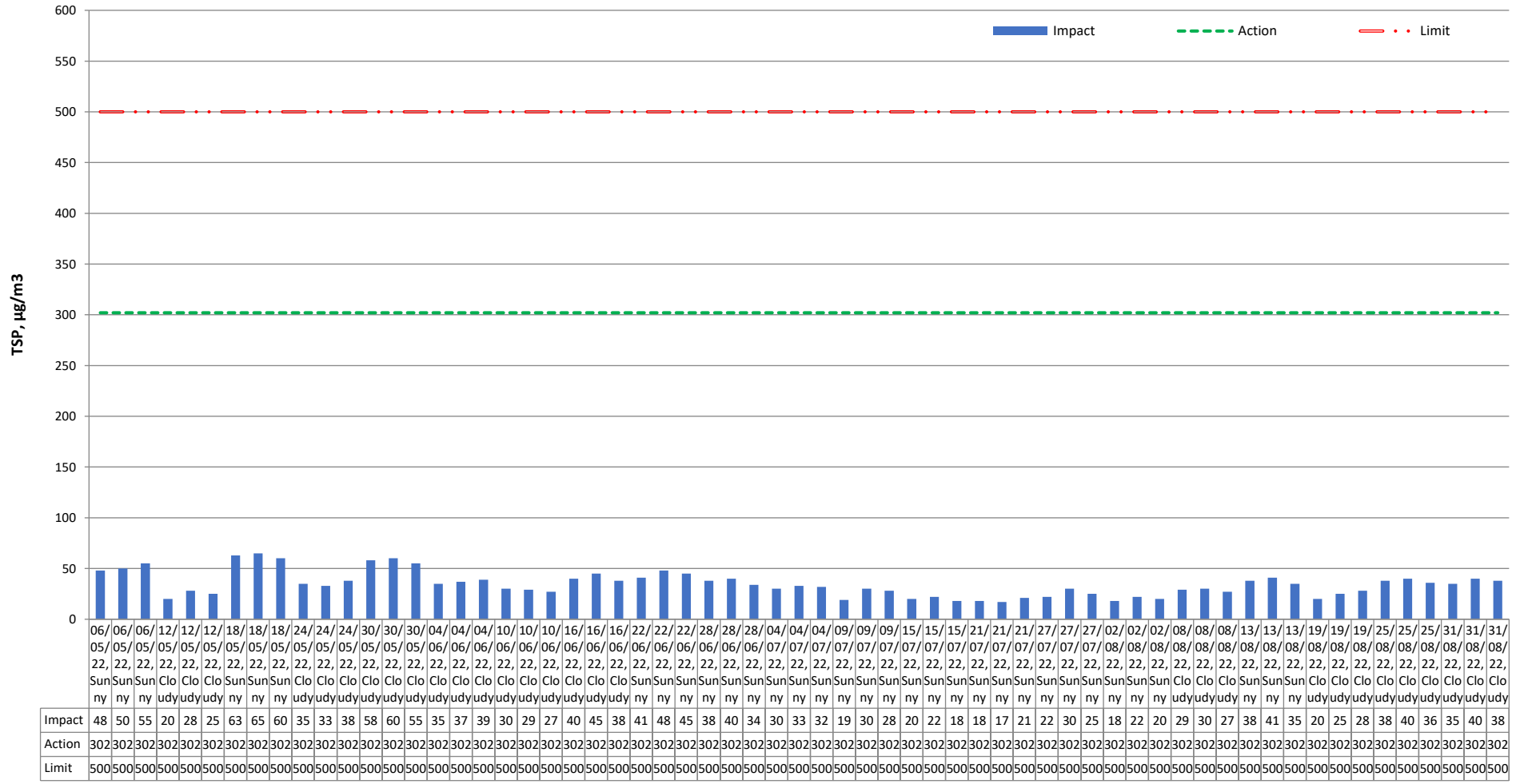
Date	Measurement Period			1-hr TSP concentration, $\mu\text{g}/\text{m}^3$	Weather
		-			
02/08/2022	13:00	-	14:00	18	Sunny
	14:00	-	15:00	22	
	15:00	-	16:00	20	
08/08/2022	13:00	-	14:00	29	Cloudy
	14:00	-	15:00	30	
	15:00	-	16:00	27	
13/08/2022	9:00	-	10:00	38	Sunny
	10:00	-	11:00	41	
	11:00	-	12:00	35	
19/08/2022	9:00	-	10:00	20	Cloudy
	10:00	-	11:00	25	
	11:00	-	12:00	28	
25/08/2022	13:00	-	14:00	38	Cloudy
	14:00	-	15:00	40	
	15:00	-	16:00	36	
31/08/2022	9:00	-	10:00	35	Cloudy
	10:00	-	11:00	40	
	11:00	-	12:00	38	
Maximum				41	
Minimum				18	
Average				31	
Action Level				301	
Limit Level				500	

Location:  
**AM3 -  
 Sky Tower**

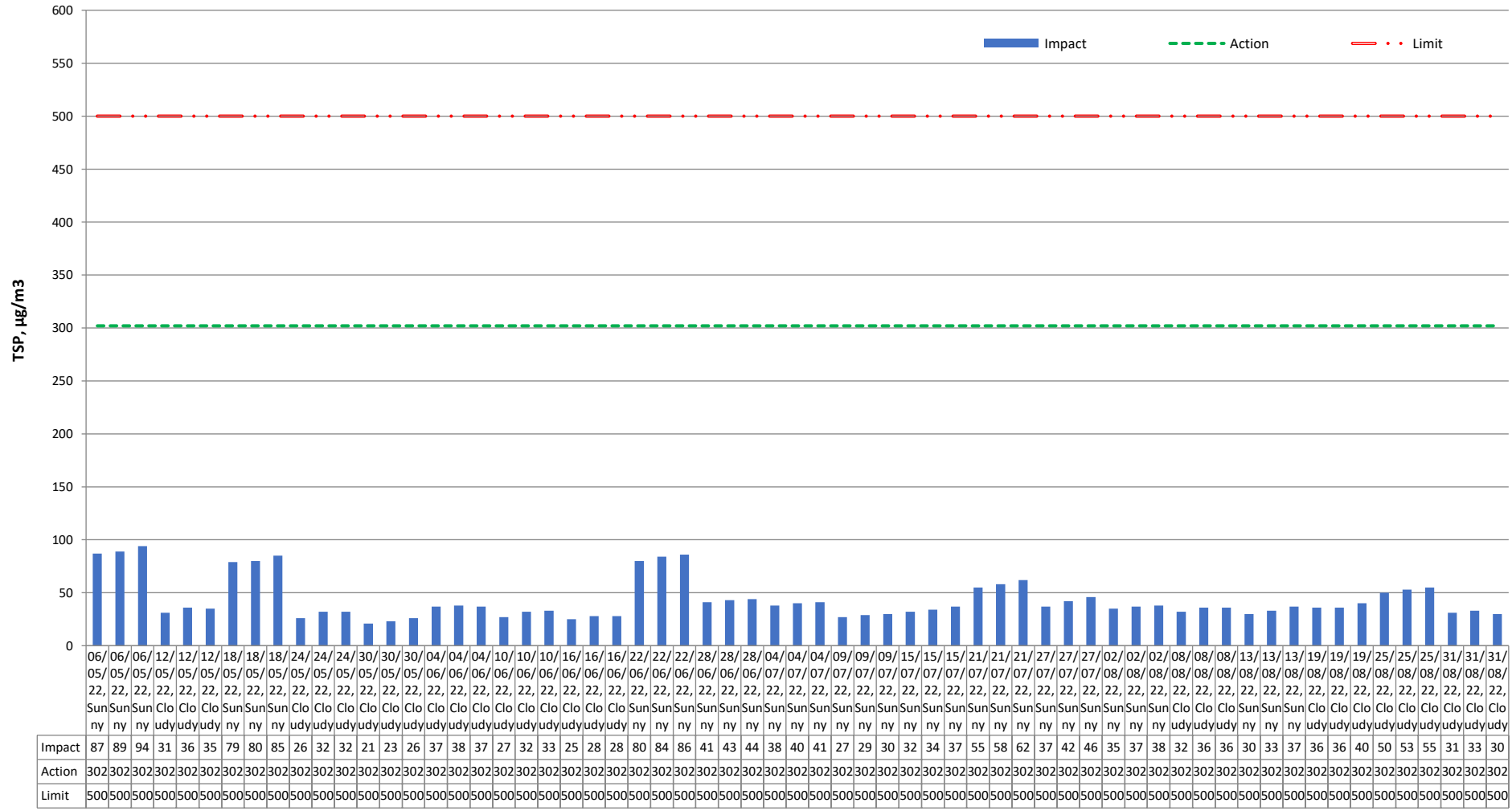
Date	Measurement Period			1-hr TSP concentration, μg/m <sup>3</sup>	Weather
		-			
02/08/2022	9:00	-	10:00	35	Sunny
	10:00	-	11:00	37	
	11:00	-	12:00	38	
08/08/2022	13:00	-	14:00	32	Cloudy
	14:00	-	15:00	36	
	15:00	-	16:00	36	
13/08/2022	13:00	-	14:00	30	Sunny
	14:00	-	15:00	33	
	15:00	-	16:00	37	
19/08/2022	9:00	-	10:00	36	Cloudy
	10:00	-	11:00	36	
	11:00	-	12:00	40	
25/08/2022	11:00	-	12:00	50	Cloudy
	13:00	-	14:00	53	
	14:00	-	15:00	55	
31/08/2022	9:00	-	10:00	31	Cloudy
	10:00	-	11:00	33	
	11:00	-	12:00	30	
Maximum				55	
Minimum				30	
Average				38	
Action Level				301	
Limit Level				500	

# 1-hour average TSP

## 1-Hour Total Suspended Particulate Results - AM2(A) Ng Wah Catholic Secondary School



### 1-Hour Total Suspended Particulate Results - AM3 Sky Tower





Major Construction Activities	Reporting Period			
	May 2022	June 2022	July 2022	August 2022
Construction of Crowd Dispersal Route	✓			
Construction of DCS	✓	✓	✓	✓
Construction works for Road L16	✓	✓	✓	✓
Renovation works for existing subways KS9 and KS32	✓	✓	✓	
Pile cap construction for PC9 and PC10 for Elevated Walkway LW-02	✓			
Pile column construction for PC9 and PC10 for Elevated Walkway LW-02		✓	✓	
Pile column construction for PC9, PC10 and PC11 for Elevated Walkway LW-02				✓
Construction works for Pedestrian Street No. 1, No. 2, No. 3 & No. 4	✓			
Erection of temporary decking across existing Kai Tak River	✓	✓	✓	
ELS and excavation for Subway KS10 Lift and Staircase	✓	✓	✓	
Demolition works to existing subway KS10 staircase and ramp	✓			
Road diversion works at Sa Po Road	✓			
ELS and excavation at launching shaft for subway SB-01	✓			
ELS and excavation for PC11 for Elevated Walkway LW-02		✓	✓	
Trial pit excavation and UU diversion at Sa Po Road under TTA Stage 2		✓	✓	
ELS, excavation and RC construction at launching shaft for subway SB-01		✓	✓	
Construction works for Pedestrian Street No. 2 & No. 4		✓	✓	
RC construction at Launching Shaft for SB-01			✓	
Twin rising main connection works			✓	
Erection of falseworks and working platform for decking of Elevated Walkway LW-02				✓
UU diversion at Sa Po Road under TTA Stage 2A				✓
Sheetpile installation at Sa Po Road under TTA Stage 2A				✓
RC construction at launching shaft for subway SB-01				✓
Construction works for Pedestrian Street No. 2				✓
RC construction for Subway KS10 Lift and Staircase				✓
Renovation works for existing subways KS9 and KS32				✓

Factors might affect the monitoring results	Reporting Period			
	May 2022	June 2022	July 2022	August 2022
Non-project related construction activities in the adjacent construction sites were observed.	✓	✓	✓	✓

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

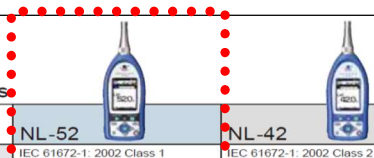
Event	Action			
	ET	IEC	Supervisor / ER	Contractor
Action Level being exceeded by one sampling	<ol style="list-style-type: none"> <li>1. Identify source and investigate the causes of exceedance;</li> <li>2. Inform Contractor, IEC and Supervisor /ER;</li> <li>3. Repeat measurement to confirm finding.</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. Implemented; 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



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 C-weighting (Z-weighting) (L <sub>eq</sub> , L <sub>max</sub> , L <sub>min</sub> , L <sub>peak</sub> ) WEED Directives, Chinese RoHS (export model for China only)	
Processing (main ch)	Instantaneous sound pressure level: L <sub>p</sub>	Equivalent continuous sound pressure level: L <sub>eq</sub>	
	Sound exposure level: L <sub>E</sub>	Maximum sound pressure level: L <sub>max</sub>	
Processing (sub ch)	Minimum sound pressure level: L <sub>min</sub>	Percentage sound levels: L <sub>N</sub> (0.1 to 99.9 %, 0.1-increment steps, max. 5 values)	
	Additional processing	Instantaneous sound pressure level: L <sub>p</sub> In addition to main processing items, one of the following can be selected for simultaneous processing: C-weighted equivalent continuous sound level: L <sub>Ceq</sub> C-weighted peak sound level: L <sub>Cpeak</sub> Z-weighting (Z-weighting) (L <sub>eq</sub> , L <sub>max</sub> , L <sub>min</sub> , L <sub>peak</sub> ) Z-weighting peak sound level: L <sub>Zpeak</sub> 1-time-weighted equivalent continuous sound level: L <sub>A1eq</sub> *2 Maximum 1-time-weighted equivalent continuous sound level: L <sub>A1max</sub> *2 The power average of the maximum level of each 5 second interval: L <sub>A1max</sub> *2 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 <sub>A1max</sub> can be selected. When C-weighting (Z-weighting) is selected, the additional processing L <sub>Ceq</sub> and L <sub>Cpeak</sub> (L <sub>Zpeak</sub> ) 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	
Inherent noise	A-weighting	17 dB or less	19 dB or less
	C-weighting	25 dB or less	27 dB or less
Frequency range	A-weighting	30 dB or less	32 dB or less
	Z-weighting	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)	Max. 110 dB (20 to 130 dB)	
	Bar graph display range max	Set the upper/lower limit in 10 dB increments.	
RMS detection circuit	Digital processing method		
Sampling cycle	20.8 μs (L <sub>p</sub> , L <sub>eq</sub> , L <sub>E</sub> , L <sub>max</sub> , L <sub>min</sub> , L <sub>peak</sub> ); sampling frequency: 48 kHz) 100 ms (L <sub>N</sub> )		
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	Data for measurement results are stored manually in single address increments.	
	Auto *2	Internal memory: max. 1000 sets SD Card: depends on the capacity of the SD Card *1 Instantaneous values (L <sub>p</sub> mode) and processed values (L <sub>eq</sub> mode) are stored continuously and automatically at preset intervals.	
Measurement Time	L <sub>p</sub> sampling cycle	100 ms, 200 ms, 1 s, L <sub>eq</sub> 1s	
	L <sub>eq</sub> 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		

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	L <sub>p</sub>
Processed value	L <sub>eq</sub> , L <sub>max</sub> , L <sub>min</sub> , L <sub>peak</sub>
Output interval	100 ms
Print out	Printing of measurement results on dedicated printer DPU-414
Power requirements	
Battery life (23 °C)	Four IEC R6 (size AA) batteries (alkaline or rechargeable batteries) or external power supply Alkaline battery LR6 (AA): 26 h *N-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 (Includes the octave and 1/3 octave data management software)	AS-60
Data management software for environmental measurement (Includes the vibration level data management software)	AS-60RT
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).

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

Distributed by:

 **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

 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



# 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: 2HB21001749-0004  
Certificate No.



委托单位: Client	Castco Testing Centre Limited		
仪器名称: Description	Sound Level Meter		
型号规格: Model/Type	NL-52		
制造商: Manufacturer	RION		
机身号: Serial No.	00921213		
管理号: Asset No.	AASL-SLM-04		
接收日期: Rec. Date	2021-08-05	校准日期: Cal. Date	2021-08-16
签发日期: App. Date	2021-08-17	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

校验:  
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

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; 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: 0~1000V; ACV: (0.001~750V@(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)	±3dB	(0~110) dB/10dB step (DC~1GHz)
PULSE分析系统	GFJGJL1001210202725/2022-03-03/航空304所	频率: $U_{rel} = 0.001\%$ , $k=2$ ; 电压: $U_{rel} = 0.04\%$ , $k=2$	频率: 0.001Hz~51.2kHz, 电压: $(1 \times 10^{-7} \sim 30)V$
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	LSsx2021-11346/2022-03-07/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。



# 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 (k=2)
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: 2HB22001076-0004  
Certificate No.



委托单位: Client	Castco Testing Centre Limited	
仪器名称: Description	Sound Level Meter	
型号规格: Model/Type	NL-52	
制造商: Manufacturer	RION	
机身号: Serial No.	01287681	
管理号: Asset No.	AAST-SLM-12	
接收日期: Rec. Date	2022-07-21	校准日期: Cal. Date
签发日期: App. Date	2022-08-04	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 赵文钰

签发:  
Approved by 郑木力

核验:  
Inspected by 钟灏

印章:  
Stamp

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

证书编号(Certificate No.): 2HB22001076-0004

### 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 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 304所	4GC21000496-0024/2022-11-01/赛宝(广州)	f: ±1mHz; 失真度 Distortion: <-70dB U=(0.05~0.20)dB (k=2)	f: 0.001Hz~200kHz; U : 100μV~5Vrms 10Hz~20kHz
标准传声器 304所	GFJGJL1001220311961/2023-03-27/航空	U=0.3dB (k=2)	(10~50000) Hz
前置放大器 304所	GFJGJL1001220311960/2023-03-27/航空	±3dB	(0~110) dB/10dB step @(DC~1GHz)
声校准器 PULSE分析系统	4GC21000572-0101/2022-12-07/赛宝(广州) 4GC22000014-0140/2023-01-15/赛宝(广州)	1级 First Level 频率:U <sub>ref</sub> =0.001%,k=2;电压: U <sub>ref</sub> =0.04%,k=2	31.5Hz~16kHz 频率:0.001Hz~51.2kHz; 电压:(1*10 <sup>-5</sup> ~30)V
数字多用表	4GC21000526-0026/2022-11-30/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: 300kHz); DCI:(0~3)A ; ACI:(0~3)A@(3Hz~ 5kHz); R:(0~100)MΩ ; f:3Hz~300kHz
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): 23.2°C 相对湿度(Relative Humidity): 58%
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。



# Calibration Certificate of Sound Level Meter



证书编号(Certificate No.): 2HB22001076-0004

### 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.)
/	/	/	/

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)
4226	94.0 (dB)	93.8 (dB)	93.8 (dB)	0.2 (dB)

### 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.): 2HB22001076-0004

### 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	-50.7	-50.5	-0.2	±2.0	P	0.5
25	-45.0	-44.7	-0.3	+2.0 ~ -1.5	P	0.5
31.5	-39.6	-39.4	-0.2	±1.5	P	0.5
40	-34.6	-34.6	0.0	±1.0	P	0.5
50	-30.2	-30.2	0.0	±1.0	P	0.5
63	-26.1	-26.2	0.1	±1.0	P	0.5
80	-22.3	-22.5	0.2	±1.0	P	0.5
100	-19.1	-19.1	0.0	±1.0	P	0.5
125	-16.1	-16.1	0.0	±1.0	P	0.5
160	-13.2	-13.4	0.2	±1.0	P	0.5
200	-10.7	-10.9	0.2	±1.0	P	0.5
250	-8.7	-8.6	-0.1	±1.0	P	0.5
315	-6.8	-6.6	-0.2	±1.0	P	0.4
400	-4.7	-4.8	0.1	±1.0	P	0.4
500	-3.1	-3.2	0.1	±1.0	P	0.4
630	-1.8	-1.9	0.1	±1.0	P	0.4
800	-0.7	-0.8	0.1	±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	1.1	1.2	-0.1	±1.0	P	0.6
2500	1.1	1.3	-0.2	±1.0	P	0.6
3150	1.0	1.2	-0.2	±1.0	P	0.6
4000	0.7	1.0	-0.3	±1.0	P	0.6
5000	0.4	0.5	-0.1	±1.5	P	0.6
6300	-0.2	-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	-2.3	-2.5	0.2	+2.0 ~ -3.0	P	0.6
12500	-4.2	-4.3	0.1	+2.0 ~ -5.0	P	1.0
16000	-8.5	-6.6	-1.9	+2.5 ~ -16.0	P	1.0
20000	-18.4	-9.3	-9.1	+3.0 ~ -∞	P	1.0

第 6 页,共 8 页  
Page of

数据页(Data sheet) ID: 071288

# Calibration Certificate of Sound Level Meter



证书编号(Certificate No.): 2HB22001076-0004

## 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)
(Hz)	(dB)	(dB)	(dB)	(dB)	(P/F)	(dB)
20	-6.3	-6.2	-0.1	±2.0	P	0.5
25	-4.5	-4.4	-0.1	+2.0 ~ -1.5	P	0.5
31.5	-3.0	-3.0	0.0	±1.5	P	0.5
40	-2.0	-2.0	0.0	±1.0	P	0.5
50	-1.2	-1.3	0.1	±1.0	P	0.5
63	-0.7	-0.8	0.1	±1.0	P	0.5
80	-0.4	-0.5	0.1	±1.0	P	0.5
100	-0.2	-0.3	0.1	±1.0	P	0.5
125	-0.1	-0.2	0.1	±1.0	P	0.5
160	0.0	-0.1	0.1	±1.0	P	0.5
200	0.0	0.0	0.0	±1.0	P	0.5
250	0.0	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	-0.1	0.0	-0.1	±1.0	P	0.6
1600	-0.2	-0.1	-0.1	±1.0	P	0.6
2000	-0.3	-0.2	-0.1	±1.0	P	0.6
2500	-0.5	-0.3	-0.2	±1.0	P	0.6
3150	-0.8	-0.5	-0.3	±1.0	P	0.6
4000	-1.1	-0.8	-0.3	±1.0	P	0.6
5000	-1.5	-1.3	-0.2	±1.5	P	0.6
6300	-2.1	-2.0	-0.1	+1.5 ~ -2.0	P	0.6
8000	-2.9	-3.0	0.1	+1.5 ~ -2.5	P	0.6
10000	-4.2	-4.4	0.2	+2.0 ~ -3.0	P	0.6
12500	-6.2	-6.2	0.0	+2.0 ~ -5.0	P	1.0
16000	-10.4	-8.5	-1.9	+2.5 ~ -16.0	P	1.0
20000	-20.4	-11.2	-9.2	+3.0 ~ ∞	P	1.0

数据页(Data sheet) ID: 071288

第 7 页,共 8 页  
Page of

# Calibration Certificate 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: 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.
- **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.



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



### Usage example

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

Applicable standards	IEC 60942: 2017 class1, ANSI/ASA S1.40-2006 class1, 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	94.0 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-hydride 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-hydride 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
Optional accessories	1/4-inch microphone adapter NC-75-S11

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

#### Strap



Securely carry the unit with the supplied hand strap

#### Soft case



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

**PISTONPHONE NC-72A**

Specifications (under standard ambient conditions\*)

Applicable standards	IEC 60942: 2017 class L5/M, class 1/M, JIS C 1515: 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), The Quality Assurance Section of RION CO., LTD. is an international MRA compliant JCSS operator with the accreditation number JCSS 0197.

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

Distributed by:



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-B 2003.PID

# Calibration Certificate 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.

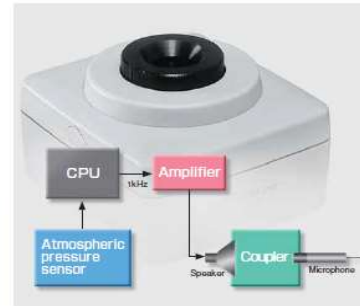


Usage example (NL series)

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 C 1515:2004 Class 1
Suitable microphones	1-inch microphones IEC 61094-1 Type LS1P UC-27 UC-28 UC-34
	1/2-inch microphones IEC 61094-1 Type LS2aP UC-09 UC-07 UC-03A UC-02 UC-26 UC-28 UC-31 UC-35P
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) × 82 (W) × 74 (D) mm Approx. 200 g (including batteries)
Supplied accessories	Case × 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:

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      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: 赵文乾  
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,Zhuacan 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.): 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	LSsx2021-13180/2022-04-24/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: $U_{rel}=0.001\%$ , $k=2$ ; $U_{rel}=0.04\%$ , $k=2$	频率: 0.001Hz~51.2kHz; 电压: $(1 \times 10^{-3} \sim 30)\text{V}$
前置放大器	LSsx2021-13000/2022-04-19/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.): 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

以下空白/No data hereafter.



# Calibration Certificate of Sound Calibrator

AAST-SLC-05, Cal 2022/08/04



**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: 2HB22001076-0001  
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	2022-07-21	校准日期: Cal. Date
签发日期: App. Date	2022-08-08	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 **张春丰**

签发:  
Approved by **郑木方**

核验:  
Inspected by **钟灏**

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东村大道西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.): 2HB22001076-0001

## 说明

### DIRECTIONS

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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):  
▪ JIG 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).  
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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	GFJGJL1001220311961/2023-03-27/航空304所	$U=(0.05-0.20)\text{dB} (k=2)$	10Hz~20kHz
前置放大器	LS6x2022-01723/2023-03-15/中国计量院	$U=0.3\text{dB} (k=2)$	(10~50000) Hz
PULSE分析系统	4GC22000014-0140/2023-01-15/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:( $1 \times 10^5-30\text{V}$ )

4. 校准地点(The calibration place):  
广州市增城区朱村街东村大道西78号9栋110室
5. 环境条件(Environmental conditions):  
温度(Temperature): 23.1°C 相对湿度(Relative Humidity): 65%
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.): 2HB22001076-0001

**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) (dB)	测量声压级 (Measured SPL) (dB)	声压级差的绝对值 (Absolute value of SPL) (dB)	允许范围 (Limit) (dB)	结论 (Pass/Fail)	$U$ (k=2) (dB)
94	93.93	0.07	≤0.40	P	0.10

**3 频率 (Frequency)**

规定频率 (Prescribed Fre.) (Hz)	测量频率 (Measured Fre.) (Hz)	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) (%)
1000	1002.1	0.21	≤1.00	P	0.10

**4 总失真 (Distortion)**

规定声压级 (Prescribed SPL) (dB)	规定频率 (Measured Fre.) (Hz)	总失真 (Distortion) (%)	允许范围 (Limit) (%)	结论 (Pass/Fail)	$U_{rel}$ (k=2) (%)
94	1000	0.07	≤3.00	P	5.0

以下空白/No data hereafter

# CEPREI

# 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 -18 to 93°C (0 to 200°F)  
 Operating (Probe) -10 to 60°C (14 to 140°F)  
 Model TA440 -20 to 60°C (-4 to 140°F)  
 Storage

#### 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		+	+
LogData2 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/°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

AAST-FLOW-03, Cal=25 Jan 2022



## Cal Lab Limited 校正實驗室有限公司

Room 2103, Technology Plaza, 29-35 Sha Tsui Road,  
 Tsuen Wan, NT, Hong Kong  
 Tel: +852 25680106 Email: info@callab.com.hk  
 Fax: +852 30116194 Website: www.callab.com.hk



### Calibration Certificate No.: CC0332201

#### Customer Information

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

#### Equipment Identification

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

#### Certificate Information

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

#### Reference Equipment Identification

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

#### Result of Calibration

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

CT-AFR-01

- Note1: The estimated expanded uncertainties have been calculated in "Evaluation and expression of uncertainty in measurement" and give an internal estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.  
 Note2: The standard (s) and instrument used in the calibration are traceable to national or international recognized standard and are calibrated on a schedule to maintain the accuracy and good condition.  
 Note3: The result reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long term stability of the instrument.  
 Note4: The result shown in this calibration certificate relate only to the item calibrated, and the result only applies to the calibration item as received.

Calibrated By:

Rex Tse

Checked and Approved By:

Warren Yeung

Company Chop:



Certificate Issue Date: 25 January 2022

CT-BEG-03

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

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

CC0332201  
 Page 1 of 1

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

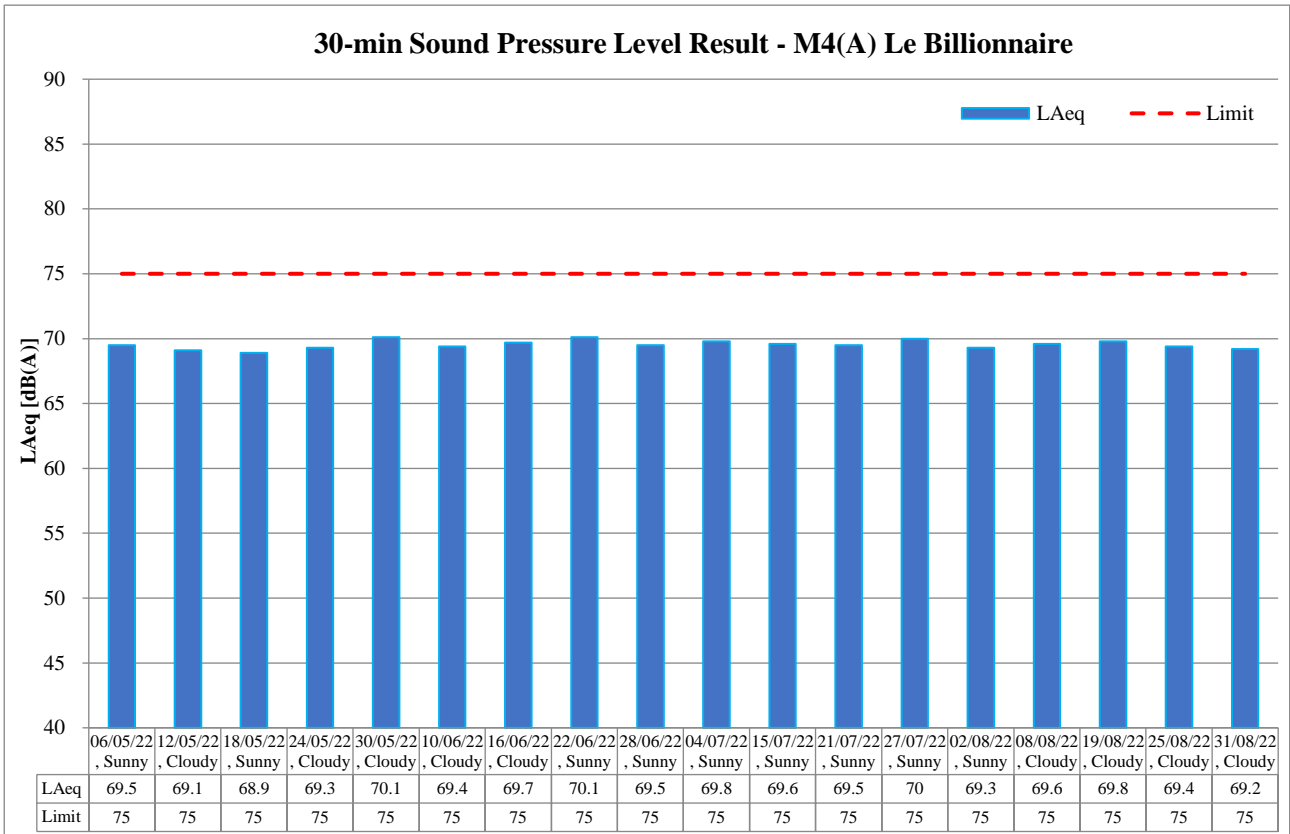
**M4(A) – Le Billionnaire**

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>	
02/08/2022	35.8	Sunny	13:05	-	13:35	69.5	69.3	70.4	68.1	75
08/08/2022	25.8	Cloudy	9:00	-	9:30	69.5	69.6	70.7	68.3	75
19/08/2022	27.7	Cloudy	13:10	-	13:40	69.5	69.8	71.1	68.5	75
25/08/2022	30.0	Cloudy	9:30	-	10:00	69.5	69.4	70.9	67.8	75
31/08/2022	33.3	Cloudy	13:25	-	13:55	69.5	69.2	70.1	67.9	75
							Maximum	69.8		
							Minimum	69.2		
							Average	69.5		

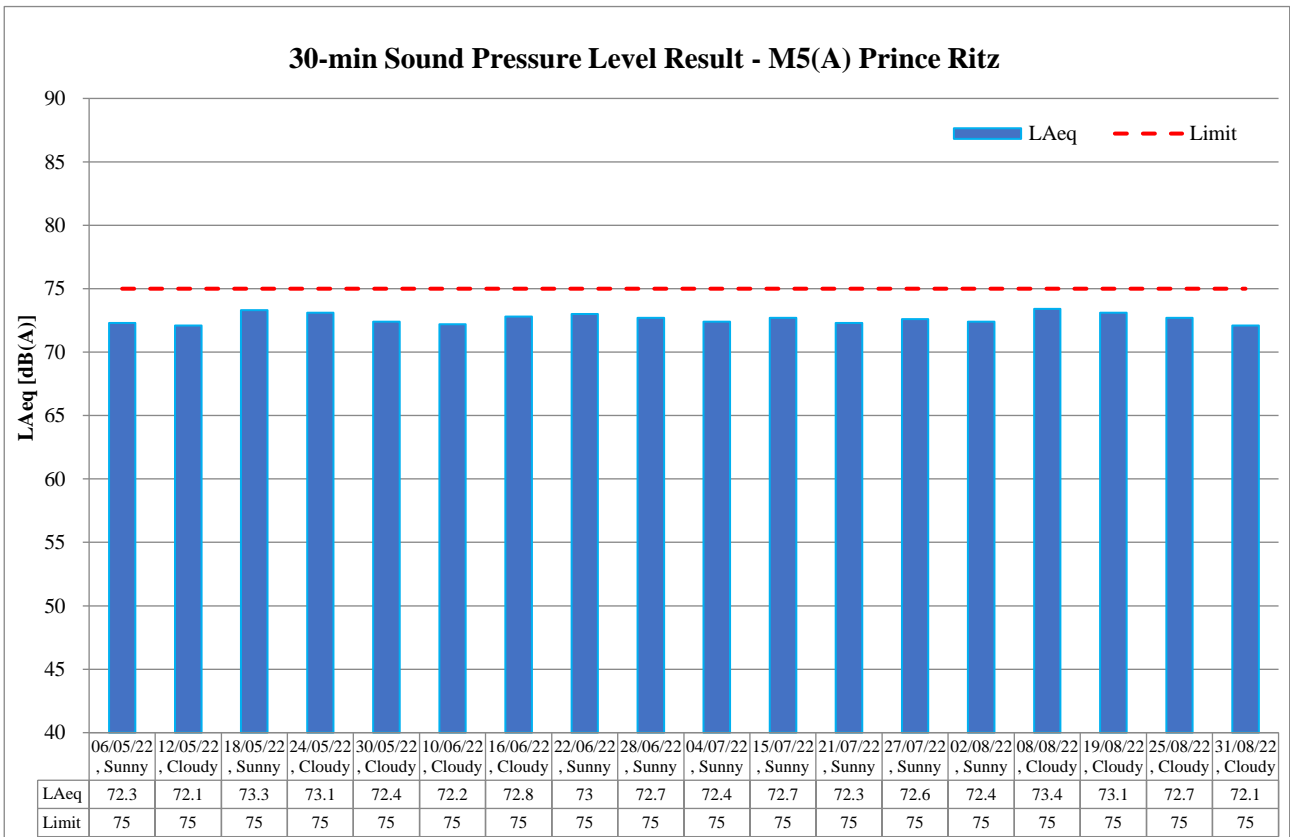
**M5(A) – Prince Ritz**

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>	
02/08/2022	35.8	Sunny	14:05	-	14:35	72.5	72.4	73.8	69.7	75
08/08/2022	25.8	Cloudy	10:05	-	10:35	72.5	73.4	74.7	71.9	75
19/08/2022	27.7	Cloudy	14:15	-	14:45	72.5	73.1	74.2	71.5	75
25/08/2022	30.0	Cloudy	10:30	-	11:00	72.5	72.7	74.1	70.1	75
31/08/2022	33.3	Cloudy	14:30	-	15:00	72.5	72.1	73.4	69.3	75
							Maximum	73.4		
							Minimum	72.1		
							Average	72.8		

**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			
	May 2022	June 2022	July 2022	August 2022
Construction of Crowd Dispersal Route	✓			
Construction of DCS	✓	✓	✓	✓
Construction works for Road L16	✓	✓	✓	✓
Renovation works for existing subways KS9 and KS32	✓	✓	✓	
Pile cap construction for PC9 and PC10 for Elevated Walkway LW-02	✓			
Pile column construction for PC9 and PC10 for Elevated Walkway LW-02		✓	✓	
Pile column construction for PC9, PC10 and PC11 for Elevated Walkway LW-02				✓
Construction works for Pedestrian Street No. 1, No. 2, No. 3 & No. 4	✓			
Erection of temporary decking across existing Kai Tak River	✓	✓	✓	
ELS and excavation for Subway KS10 Lift and Staircase	✓	✓	✓	
Demolition works to existing subway KS10 staircase and ramp	✓			
Road diversion works at Sa Po Road	✓			
ELS and excavation at launching shaft for subway SB-01	✓			
ELS and excavation for PC11 for Elevated Walkway LW-02		✓	✓	
Trial pit excavation and UU diversion at Sa Po Road under TTA Stage 2		✓	✓	
ELS, excavation and RC construction at launching shaft for subway SB-01		✓	✓	
Construction works for Pedestrian Street No. 2 & No. 4		✓	✓	
RC construction at Launching Shaft for SB-01			✓	
Twin rising main connection works			✓	
Erection of falseworks and working platform for decking of Elevated Walkway LW-02				✓
UU diversion at Sa Po Road under TTA Stage 2A				✓
Sheetpile installation at Sa Po Road under TTA Stage 2A				✓
RC construction at launching shaft for subway SB-01				✓
Construction works for Pedestrian Street No. 2				✓
RC construction for Subway KS10 Lift and Staircase				✓
Renovation works for existing subways KS9 and KS32				✓

Factors might affect the monitoring results	Reporting Period			
	May 2022	June 2022	July 2022	August 2022
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 2022 (YEAR)**

Month	Actual Quantities of Inert C&D Materials Generated Monthly								Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated A + B	Broken Concrete Generated A	General fill Generated B	Broken Concrete Reused in the Contract	General Fill Reused in the Contract	Reused in other Projects	Disposal as Public Fill	Import Fill	Metals	Paper / Cardboard Packaging	Plastics (β)	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 '000m <sup>3</sup> ]	[in '000m <sup>3</sup> ]	[in '000kg]	[in '000kg]	[in '000kg]	[in '000kg]	[in '000m <sup>3</sup> ]
JAN	1.91	0.00	1.91	0.00	1.20	0.00	0.71	0.00	0.00	0.00	0.00	0.00	0.01
FEB	0.66	0.03	0.63	0.00	0.30	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00
MAR	0.97	0.00	0.97	0.00	0.25	0.00	0.72	0.00	0.00	0.00	0.00	0.00	0.01
APR	0.97	0.00	0.97	0.00	0.30	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.01
MAY	0.37	0.01	0.36	0.00	0.22	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.01
JUNE	0.47	0.00	0.47	0.00	0.22	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.01
SUB-TOTAL	5.35	0.04	5.31	0.00	2.49	0.00	2.82	0.00	0.00	0.00	0.00	0.00	0.05
JULY	1.88	0.00	1.88	0.00	0.35	0.00	1.53	0.00	0.00	0.00	0.00	0.00	0.01
AUG	1.73	0.00	1.73	0.00	0.28	0.00	1.45	0.00	0.00	0.00	0.00	0.00	0.01
SEPT													
OCT													
NOV													
DEC													
TOTAL	8.96	0.04	8.92	0.00	3.12	0.00	5.80	0.00	0.00	0.00	0.00	0.00	0.07

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

EIA Ref	Recommended Mitigation Measures	Implementation			
Part B Water Quality		Not Observed	Yes	No	Remark
S8.8	Exposed soil areas should be minimised to reduce the potential for increased siltation, contamination of runoff, and erosion. <del>Construction runoff related impacts associated with the above ground construction activities can be readily controlled through the use of appropriate mitigation measures which include use of sediment traps and adequate maintenance of drainage systems to prevent flooding and overflow</del>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S8.8	Construction site should be provided with adequately designed perimeter channel and pre-treatment facilities and proper maintenance. <del>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 1/04.</del>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S8.8	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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S8.8	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. <del>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.</del>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S8.8	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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S8.8	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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S8.8	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. Particular attention should be paid to the control of silty surface runoff during storm events.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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. <del>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.</del>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S8.8	<i>Drainage</i> 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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	



EIA Ref	Recommended Mitigation Measures	Implementation			
	is optimised and that disposal of any solid materials, litter or wastes to marine waters does not occur				
S8.8	Construction Works at or in Close Proximity of Storm Culvert or Seafront The proposed works should preferably be carried out within the dry season where the flow in the drainage channel /storm culvert/ nullah is low.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S8.8	Stockpiling of construction materials and dusty materials should be covered and located away from any water courses.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S8.8	Construction activities, which generate large amount of wastewater, should be carried out in a distance away from the waterfront, where practicable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S8.8	Construction effluent, site run-off and sewage should be properly collected and/or treated.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S8.8	Proper shoring may need to be erected in order to prevent soil/mud from slipping into the storm culvert/drainage channel/sea.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S8.8	Supervisory staff should be assigned to station on site to closely supervise and monitor the works	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Part C Construction Noise Impact</b>		Not Observed	Yes	No	Remark
S7.8	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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S7.9	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.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Part D Waste / Chemical Management</b>		Not Observed	Yes	No	Remark
S5.2	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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Training of site personnel in site cleanliness, proper waste management and chemical waste handling procedures	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Provision of sufficient waste disposal points and regular collection for waste. Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors. Separation of chemical wastes for special handling and appropriate treatment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S9.5	1)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 2)Training of site personnel in proper waste management and chemical waste handling procedures 3)Provision of sufficient waste disposal points and regular collection for disposal 4)Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers 5)A recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

EIA Ref	Recommended Mitigation Measures	Implementation			
S9.5	Waste Reduction Measures 1) Sort C&D waste from demolition of the remaining structures to recover recyclable portions such as metals 2) 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 3) Encourage collection of aluminum 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 4) Any unused chemicals or those with remaining functional capacity should be recycled 5) Proper storage and site practices to minimize the potential for damage or contamination of construction materials	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S9.5	Construction and Demolition Material Mitigation measures and good site practices should be incorporated into contract document to control potential environmental impact from handling and transportation of C&D material. The mitigation measures include: 1) <del>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 should be located away from waterfront or storm drains as far as possible</del> 2) <del>Open stockpiles of construction materials or construction wastes on site should be covered with tarpaulin or similar fabric</del> 3) <del>Skip hoist for material transport should be totally enclosed by impervious sheeting</del> 4) Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving a construction site 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 6) <del>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</del> 7) <del>All dusty materials should be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet</del>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S9.5	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 designated 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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S9.5	Chemical Waste 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>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Part E Landscape &amp; Visual</b>		Not Observed	Yes	No	Remark
S13.9	CM1 - All existing trees should be carefully protected during construction. <del>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.</del> CM3 - Control of night time lighting. CM4 - Erection of decorative screen hoarding.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Part F Air Quality</b>		Not Observed	Yes	No	Remark
S6.8	<del>Stockpiling site(s) should be lined with impermeable sheeting and bunded.</del> Stockpiles should be fully covered by impermeable sheeting to reduce dust emission.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S6.8	Misting for the dusty material should be carried out before being loaded into the vehicle.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S6.8	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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S6.8	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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S6.8	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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S6.8	Vehicle washing facilities should be provided at every vehicle exit point	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S6.8	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.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S6.8	Every main haul road should be <del>sealed with concrete and</del> kept clear of dusty materials or sprayed with water so as to maintain the entire road surface wet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

EIA Ref	Recommended Mitigation Measures	Implementation			
S6.8	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.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S6.8	Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S6.5	8 times daily watering of the work site with active dust emitting activities.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

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

**Reporting Month: August 2022**

<b>Contract No.</b>	<b>Record of Complaint (Yes/No)</b>	<b>Record of Warning (Yes/No)</b>	<b>Notification of Summons and Successful Prosecutions (Yes/No)</b>
ED/2018/05	No	No	No

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

<b>Contract No.</b>	<b>Record of Complaint</b>	<b>Record of Warning</b>	<b>Notification of Summons and Successful Prosecutions</b>
ED/2018/05	1	0	0