

Leighton-China States Joint Venture

**Contract SCL1123 –
Exhibition Station & Western Approach
Tunnel**

Quarterly EM&A Report

for

FEP-13/364/2009/H & FEP-03/376/2009

[Period from Nov 2021 to Jan 2022]

(June 2022)



Verified by: Claudine LEE

Position: Independent Environmental Checker

Date: 2 June 2022

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Verified by: FUNG Yiu Wah 

Position: Environmental Team Leader

Date: 2 June 2022

Leighton – China State J.V.**Shatin to Central Link -
Hung Hom to Admiralty Section****Works Contract 1123 -
CEDD Entrusted Work for Road P2 & other roads and Slip Road 3****Quarterly Environmental Monitoring
and Audit Report****- November 2021 to January 2022 -**

[May 2022]

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EXECUTIVE SUMMARY

Shatin to Central Link Contract 1123 – CEDD Entrusted Work for Road P2 & other roads and Slip Road 3 (hereafter called “the Project”) covers part of the construction of CEDD entrusted work under the granted Further Environmental Permit: FEP–03/376/2009 and FEP–13/364/2009 respectively.

The Project comprises the construction of Road P2 and other roads which are classified as primary/district distributor roads and Slip Road 3.

The EM&A programme commenced on 25 January 2021. The impact EM&A for the Project includes air quality and noise monitoring.

This report documents the findings of EM&A works conducted in the period between 1 November and 31 January 2022. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities		
	November 2021	December 2021	January 2022
Road P2 – West (Slip Road 3)	<ul style="list-style-type: none"> • Drainage and Road works • TTM 3 was implemented on 27 November 2021. 	<ul style="list-style-type: none"> • Drainage works 	<ul style="list-style-type: none"> • Underground Drainage • Road works
Road P2 – East (Hung Hing Road)	<ul style="list-style-type: none"> • Drainage works • Road pavement 	<ul style="list-style-type: none"> • Drainage works • Road pavement 	<ul style="list-style-type: none"> • Drainage works • Underground Utilities • Road works (TTM)
Road P2 – Permanent PTI (Public Transport Interchange)	<ul style="list-style-type: none"> • Drainage works • Road works (concrete pavement and asphalt) 	<ul style="list-style-type: none"> • Drainage works • Road works (concrete pavement and asphalt) • Footpath -paving block • Bus shelter -Steel and glazing installation. 	<ul style="list-style-type: none"> • Complete PTI and handover

Breaches of Action and Limit Levels for Air Quality

No exceedance of Action and Limit Level of air quality was recorded in the reporting period.

Breaches of Action and Limit Levels for Noise

Regular Noise Monitoring

No Action Level exceedance was recorded since no noise related complaint was received in the reporting period.

No exceedance of Limit Level of noise was recorded in the reporting period.

Complaint, Notification of Summons and Successful Prosecution

No complaint, notification of summons and successful prosecution were received in the reporting period.

Reporting Changes

There was no reporting change in the reporting period.

1. INTRODUCTION

Leighton – China State Joint Venture (JV) was commissioned by MTR as the Civil Contractor for CEDD Entrusted Works under Contract 1123. AECOM Asia Company Limited (AECOM) was appointed by JV as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme during construction phase of the Project.

1.1 Purpose of the Report

- 1.1.1 This is the third quarterly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period between 1 November 2021 and 31 January 2022.

1.2 Report Structure

- 1.2.1 This Quarterly EM&A Summary Report is organized as follows:

- Section 1: Introduction
- Section 2: Project Information
- Section 3: Environmental Monitoring Requirement
- Section 4: Implementation Status of Environmental Mitigation Measures
- Section 5: Monitoring Results
- Section 6: Environmental Site Inspection and Audit
- Section 7: Environmental Non-conformance
- Section 8: Future Key Issues
- Section 9: Conclusions and Recommendations

2 PROJECT INFORMATION

2.1 Background

- 2.1.1 Road P2 and other roads which are classified as primary/district distributor roads identified as DP2 which covered in the Environmental Permit No. EP-376/2009 in the approved Wan Chai Development Phase II (WDII) and Central – Wan Chai Bypass (CWB) comprising (i) a dual 2-lane primary distributor road, Road P2; and (ii) other new primary and district distributor roads connecting to the slip roads of the Central-Wan Chai Bypass.
- 2.1.2 Slip road 3 identified as part of DP1 which covered in the Environmental Permit No. EP-364/2009/H in the approved Wan Chai Development Phase II (WDII) and Central – Wan Chai Bypass (CWB) comprising (i) slip roads to connect the CWB to the local road system in the Wan Chai North and Causeway Bay area; and (ii) associated road lighting, road signing, traffic control and surveillance system (iii) other associated works.
- 2.1.3 The Environmental Impact Assessment Report for Central - Wan Chai Bypass and Island Eastern Corridor Link (CWB&IECL) EIA Report (Register No. AEIAR-041/2001) and the Wan Chai Development Phase II and Central-Wan Chai Bypass (WDII&CWB) EIA Report (Register No. AEIAR-125/2008) which were approved on 31 August 2001 and 11 December 2008 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permits (EPs) were granted on 13 November 2009 and 22 April 2020 respectively, which covers Road P2 and other roads which are classified as primary/district distributor roads **[DP2]** and Central – Wan Chai Bypass (CWB) including its Road Tunnel and Slip Roads **[DP1]** (EP No.: EP-376/2009 and EP-364/2009/H), for the construction and operation. Further Environmental Permits (FEP No. FEP-03/376/2009 and FEP-13/364/2009/H) were both subsequently granted from the Director of Environmental Protection (DEP) on 2 June 2020, which cover the construction works for DP2 and a part of DP1 respectively.
- 2.1.4 The site layout plan of the Project is shown in **Figure 1.1**.

2.2 Site Description

2.2.1 The major construction activities under CEDD Entrusted Works of Contract 1123 include:

- (a) Site preparation;
- (b) Construct for dual 2-lane primary distributor road, Road P2;
- (c) Construct for other new primary and district distributor roads connecting to the slip roads of the Central-Wan Chai Bypass;
- (d) Construct for slip roads to connect the CWB to the local road system in the Wan Chai North and Causeway Bay area;
- (e) Construct for associated road lighting, road signing, traffic control and surveillance system; and
- (f) Construct for other associated works;

2.3 Construction Programme and Activities

2.3.1 The major construction activities undertaken in the reporting period are summarised below:

Location	Site Activities		
	November 2021	December 2021	January 2022
Road P2 – West (Slip Road 3)	<ul style="list-style-type: none"> • Drainage and Road works • TTM 3 was implemented on 27 November 2021. 	<ul style="list-style-type: none"> • Drainage works 	<ul style="list-style-type: none"> • Underground Drainage • Road works
Road P2 – East (Hung Hing Road)	<ul style="list-style-type: none"> • Drainage works • Road pavement 	<ul style="list-style-type: none"> • Drainage works • Road pavement 	<ul style="list-style-type: none"> • Drainage works • Underground Utilities • Road works (TTM)
Road P2 – Permanent PTI (Public Transport Interchange)	<ul style="list-style-type: none"> • Drainage works • Road works (concrete pavement and asphalt) 	<ul style="list-style-type: none"> • Drainage works • Road works (concrete pavement and asphalt) • Footpath -paving block • Bus shelter -Steel and glazing installation. 	<ul style="list-style-type: none"> • Complete PTI and handover

2.3.2 The construction programme is presented in **Appendix A**.

2.4 Project Organisation

- 2.4.1 The project organization structure is shown in **Appendix B**. The key personnel contact names and numbers for the Project are summarised in **Table 2.1**.

Table 2.1 Contact Information of Key Personnel

Party	Role	Position	Name	Telephone	Fax
MTR	Residential Engineer (ER)	Construction Manager	Mr. Mike Bezzano	3959 2128	3959 2200
Meinhardt	Independent Environmental Checker	Independent Environmental Checker	Ms. Claudine Lee	2859 5409	2540 1580
JV	Contractor	Project Director	Mr. Brian Shepstone	3973 0838	31051126
		Environmental Engineer	Mr. Andy Leung	3973 1498	
AECOM	Environmental Team (ET)	ET Leader	Mr. Y W Fung	3922 9366	2317 7609

2.5 Status of Environmental Licences, Notification and Permits

2.5.1 Relevant environmental licenses, permits and/or notifications on environmental protection for this Project and valid in the reporting period are summarized in **Table 2.2**.

Table 2.2 Status of Environmental Licenses, Notifications and Permits

Permit / License No. / Notification/ Reference No.	Valid Period		Status	Remarks
	From	To		
Environmental Permit				
FEP-03/376/2009	2 Jun 2020	End of Contract	Valid	
FEP-13/364/2009/H	2 Jun 2020	End of Contract	Valid	
Construction Noise Permit				
-	-	-	-	-
Wastewater Discharge License¹				
-	-	-	-	-
Chemical Waste Producer Registration				
5213-135-L2881-01	02 Apr 2015	End of Contract	Valid	For whole site at Wan Chai Area
Marine Dumping Permit				
-	-	-	-	-
Billing Account for Construction Waste Disposal				
7021736	16 Feb 2015	End of Contract	Valid	For Disposal of C&D Waste
Notification Under Air Pollution Control (Construction Dust) Regulation				
385128	1 Mar 2015	End of Contract	Valid	For whole site at Wan Chai Area

Remark:

1. The Contractor was reminded to keep tracking on the site condition s and review its application for wastewater discharge license.

3 ENVIRONMENTAL MONITORING REQUIREMENT

3.1 Construction Dust Monitoring

Monitoring Requirements

- 3.1.1 In accordance with the approved EM&A Manuals, 24-hour and 1-hour Total Suspended Particulates (TSP) levels at the designated air quality monitoring station is required. Impact 24-hour monitoring should be carried out for at least once every 6 days and 1-hour TSP monitoring should be done at least 3 times every 6 days while the highest dust impact is expected. The Action and Limit level of the air quality monitoring is provided in **Appendix D**.

Monitoring Equipment

- 3.1.2 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) located at the designated monitoring stations. The HVS meets all the requirements of the EM&A Manual.
- 3.1.3 A portable direct reading dust meter was used to carry out the 1-hour TSP monitoring.
- 3.1.4 Brand and model of the equipment is given in **Table 3.1**.

Table 3.1 Air Quality Monitoring Equipment

Equipment	Brand and Model
High Volume Sampler (24-hour TSP)	Andersen Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. GS 2310 (S/N:10273)) (Model No. GS 2310 (S/N:3384))
Calibration Kit (24-hour TSP)	TISCH Environmental Orifice (Model TE-5025A (S/N: 843))
Portable direct reading dust meter (1-hour TSP)	Sibata Digital Dust Monitor (Model No. LD-3)

Monitoring Locations

- 3.1.5 The monitoring station for construction dust monitoring pertinent to the Project has been identified based on the approved EM&A Manual for SCL (HUH-ADM) of the Project. The location of the construction dust monitoring stations are summarised in **Table 3.2** and shown in **Figure 3.1**.

Table 3.2 Locations of Construction Dust Monitoring Station

Station ID	Dust Monitoring Station
CMA5b ¹	Pedestrian Plaza
CMA6a ¹	WDII PRE Site Office

Remark:

1. According to the updated site layout of CEDD Entrusted Works and Updated EM&A Manual for EP-376/2009 and EP-364/2009, Pedestrian Plaza (CMA5b) and WDII PRE Site Office (CMA6A) were selected as the most affected sensitive receiver during the construction phase.

Monitoring Methodology

- 3.1.6 24-hour TSP Monitoring
- (a) The HVS was installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS as far as practicable: -
- (i) A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
 - (ii) Two samplers should not be placed less than 2m apart from each others;

- (iii) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
 - (iv) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
 - (v) A minimum of 2 meters separation from any supporting structure, measured horizontally is required.
 - (vi) No furnace or incinerator flues nearby.
 - (vii) Airflow around the sampler was unrestricted.
 - (viii) The sampler was located more than 20 meters from any dripline.
 - (ix) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.
 - (x) Permission was obtained to set up the samplers and access to the monitoring station.
 - (xi) A secured supply of electricity was obtained to operate the sampler.
- (b) Preparation of Filter Papers
- (i) Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
 - (ii) All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ± 3 °C; the relative humidity (RH) was < 50% and not variable by more than $\pm 5\%$. A convenient working RH was 40%.
 - (iii) All filter papers were prepared and analysed by ALS Technichem (HK) Pty Ltd., which is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes.
- (c) Field Monitoring
- (i) The power supply was checked to ensure the HVS works properly.
 - (ii) The filter holder and the area surrounding the filter were cleaned.
 - (iii) The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
 - (iv) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
 - (v) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
 - (vi) Then the shelter lid was closed and was secured with the aluminium strip.
 - (vii) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
 - (viii) A new flow rate record sheet was set into the flow recorder.
 - (ix) On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.3 m³/min, and complied with the range specified in the EM&A Manual (i.e. 0.6-1.7 m³/min).
 - (x) The programmable digital timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.
 - (xi) The initial elapsed time was recorded.
 - (xii) At the end of sampling, on site temperature and atmospheric pressure readings were taken and the final flow rate of the HVS was checked and recorded.
 - (xiii) The final elapsed time was recorded.
 - (xiv) The sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
 - (xv) It was then placed in a clean envelope and sealed.
 - (xvi) All monitoring information was recorded on a standard data sheet.
 - (xvii) Filters were then sent to ALS Technichem (HK) Pty Ltd. for analysis.
- (d) Maintenance and Calibration
- (i) The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.

- (ii) HVSs were calibrated using TE-5025A Calibration Kit upon installation and thereafter at bi-monthly intervals.
- (iii) Calibration certificate of the TE-5025A Calibration Kit and the HVSs are provided in **Appendix E**.

3.1.7 1-hour TSP Monitoring

(a) Measuring Procedures

The measuring procedures of the 1-hour dust meter are in accordance with the Manufacturer's Instruction Manual as follows:

- (i) Turn the power on.
- (ii) Close the air collecting opening cover.
- (iii) Push the "TIME SETTING" switch to [BG]
- (iv) Push "START/STOP" switch to perform background measurement for 6 seconds.
- (v) Turn the knob at SENSI ADJ position to insert the light scattering plate.
- (vi) Leave the equipment for 1 minute upon "SPAN CHECK" is indicated in the display.
- (vii) Push "START/STOP" switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.
- (viii) Pull out the knob and return it to MEASURE position.
- (ix) Push the "TIME SETTING" switch the time set in the display to 3 hours.
- (x) Lower down the air collection opening cover.
- (xi) Push "START/STOP" switch to start measurement.

(b) Maintenance and Calibration

- (i) The 1-hour TSP meter was calibrated at 1-year intervals against a continuous particulate TEOM Monitor, Series 1400ab. Calibration certificates of the Laser Dust Monitors are provided in **Appendix E**.

Monitoring Schedule for the Reporting Period

- 3.1.8 The schedule for environmental monitoring between November 2021 to January 2022 is provided in **Appendix F**.

3.2 Construction Noise Monitoring

Monitoring Requirements

- 3.2.1 In accordance with the EM&A Manual, impact noise monitoring should be conducted for at least once a week during the construction phase of the Project. **Table 3.3** summarises the monitoring parameters, frequency and duration of impact noise monitoring. The Action and Limit level of the noise monitoring is provided in **Appendix D**.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Parameter and Duration	Frequency
30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays. Leq, L ₁₀ and L ₉₀ would be recorded.	At least once per week

Monitoring Equipment

- 3.2.2 Noise monitoring was performed using sound level meter at each designated monitoring station. The sound level meters deployed comply with the International Electrotechnical Commission Publications (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in **Table 3.4**.

Table 3.4 Noise Monitoring Equipment for Regular Noise Monitoring

Equipment	Brand and Model
Integrated Sound Level Meter	Model No. B&K 2270 (S/N: 2644597) Model No. B&K 2250-L (S/N: 2681366)
Acoustic Calibrator	Model No. MVI CAL21 (S/N: 34113610(2011)) Model No. B&K 4231 (S/N:3006428)

Monitoring Locations

- 3.2.3 The monitoring station for construction noise monitoring pertinent to the Project has been identified based on the approved EM&A Manual for SCL (HUH-ADM) of the Project. Location of the noise monitoring station is summarised in **Table 3.5** and shown in **Figure 3.1**.

Table 3.5 Noise Monitoring Station during Construction Phase

Identification No.	District	Alternative Noise Monitoring Location
M1a ¹	Wan Chai	Footbridge for Ex-Harbour Road Sports Centre

Remark:

1. According to the updated site layout of CEDD Entrusted Works and Updated EM&A Manual for EP-376/2009 and EP-364/2009, Footbridge for Ex-Harbour Road Sports Centre (M1a) was selected as the most affected sensitive receiver during the construction phase.

Monitoring Methodology

- 3.2.4 Monitoring Procedure

- (a) Façade measurements were made at M1a.
- (b) The battery condition was checked to ensure the correct functioning of the meter.
- (c) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
 - (i) frequency weighting: A

- (ii) time weighting: Fast
- (iii) time measurement: $L_{eq(30\text{-minutes})}$ during non-restricted hours i.e. 0700 – 1900 on normal weekdays.
- (d) Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94 dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- (e) During the monitoring period, the L_{eq} , L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- (f) Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.
- (g) Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind with gusts exceeding 10m/s.

3.2.5 Maintenance and Calibration

- (a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.
- (b) The meter and calibrator were sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.
- (c) Calibration certificates of the sound level meters and acoustic calibrators are provided in **Appendix E**.

Monitoring Schedule for the Reporting Period

- 3.2.6 The schedule for environmental monitoring November 2021 to January 2022 is provided in **Appendix F**.

4 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

- 4.1.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Reports, the EP and EM&A Manuals. The implementation status of the environmental mitigation measures during the reporting period is summarized in **Appendix C**. Status of required submissions under the EP during the reporting period is summarised in **Table 4.1**.

Table 4.1 Status of Required Submission under Further Environmental Permit

EP Condition	Submission	Submission Date
Condition 2.4 (FEP-13//364/2009/H & FEP-03/376/2009)	Construction Noise Management Plan	19 November 2020
Condition 2.5 (FEP-13//364/2009/H & FEP-03/376/2009)	Landscape Plan	3 November 2020
Condition 3.3 (FEP-13//364/2009/H & FEP-03/376/2009)	Quarterly EM&A Report for August to October 2021	4 March 2022
Condition 3.3 (FEP-13//364/2009/H & FEP-03/376/2009)	Monthly EM&A Report for November 2021	13 December 2021
Condition 3.3 (FEP-13//364/2009/H & FEP-03/376/2009)	Monthly EM&A Report for December 2021	10 January 2022
Condition 3.3 (FEP-13//364/2009/H & FEP-03/376/2009)	Monthly EM&A Report for January 2022	15 February 2022

5 MONITORING RESULTS

5.1 Construction Dust Monitoring

- 5.1.1 The monitoring results for 24-hour TSP and 1-hour TSP are summarised in **Table 5.1** and **Table 5.2** respectively. Detailed air quality monitoring results and wind monitoring data extracted from the nearest Automatic Weather Station are presented in **Appendix G**.

Table 5.1 Summary of 24-hour TSP Monitoring Result in the Reporting Period

ID	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
CMA5b	59.0	13.2 – 87.4	209.9	260
CMA6a	35.2	10.3 – 70.0	207.1	260

Table 5.2 Summary of 1-hour TSP Monitoring Result in the Reporting Period

ID	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
CMA5b	65.4	60.1 – 69.8	339.7	500
CMA6a	62.2	57.4 – 66.1	333	500

- 5.1.2 No Action and Limit Level exceedance were recorded for 1-hour TSP monitoring at the monitoring locations in the reporting period.
- 5.1.3 No Action and Limit Level exceedance were recorded for 24-hour TSP monitoring at the monitoring locations in the reporting period.
- 5.1.4 The event and action plan is annexed in **Appendix I**.
- 5.1.5 Major dust sources during the monitoring included construction dust, nearby traffic emission and other nearby construction sites.

5.2 Regular Construction Noise Monitoring

- 5.2.1 The monitoring results for noise are summarized in **Table 5.3** and the monitoring data is provided in **Appendix H**.

Table 5.3 Summary of Construction Noise Monitoring Results in the Reporting Period

ID	Range, dB(A), L_{eq} (30 mins)	Limit Level, dB(A), L_{eq} (30 mins)
M1a(*)	<Baseline	75

(*) Baseline correction will be made to the measured L_{eq} when the measured noise level exceeded the corresponding baseline noise level and presented in the table.

- 5.2.2 No Action Level exceedance was recorded since no noise related complaint was received in the reporting period.
- 5.2.3 No Limit Level exceedance of noise was recorded at the monitoring station in the reporting period.
- 5.2.4 The event and action plan is annexed in **Appendix I**.

- 5.2.5 Major noise sources during the monitoring included construction noise from the Project site, nearby traffic noise and the community.

5.3 Waste Management

- 5.3.1 C&D materials and wastes sorting were carried out on site. Receptacles were available for C&D wastes and general refuse collection.
- 5.3.2 As advised by the Contractor, 1,263 m³ of inert C&D material was generated and disposed of as public fill in the reporting period. No inert C&D materials were reused in other projects or in the Contract in the reporting period. No fill material was imported in the reporting period. No general refuse was generated in the reporting period. No metal, paper/cardboard packaging material, plastic was collected by recycling contractor in the reporting period. No chemical waste was collected by licensed contractor in the reporting period. No Type 1 and Type 2 of Marine sediment were disposed of at Confined Marine Disposal Facility to the East of Sha Chau. The waste flow table is annexed in **Appendix K**.
- 5.3.3 The Contractor is advised to properly maintain on site C&D materials and wastes collection, sorting and recording system and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.
- 5.3.4 The Contractor is 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

5.4 Landscape and Visual

- 5.4.1 Weekly inspection of the implementation of landscape and visual mitigation measures was conducted. A summary of the site inspection is provided in **Appendix C**.

6 ENVIRONMENTAL SITE INSPECTION AND AUDIT

- 6.1.1 Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. A summary of the mitigation measures implementation schedule is provided in **Appendix C**.
- 6.1.2 In the reporting period, 14 site inspections were carried out between 1 November 2021 to 31 January 2022. No non-compliance was recorded during the site inspection. During environmental site inspections conducted during the reporting period, minor deficiencies were made.
- 6.1.3 All follow-up actions requested by Contractor's ET and IEC during the site inspection were undertaken as reported by the Contractor and confirmed in the following weekly site inspection conducted during the reporting period.

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 Summary of Monitoring Exceedances

- 7.1.1 All 24-hour TSP result was below the Action and Limit level at all monitoring locations in the reporting period.
- 7.1.2 All 1-hour TSP result was below the Action and Limit level at all monitoring locations in the reporting period.
- 7.1.3 No Action Level exceedance was recorded since no noise related complaint was received in the reporting period.
- 7.1.4 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting period.

7.2 Summary of Environmental Non-Compliance

- 7.2.1 No environmental non-compliance was recorded in the reporting period.

7.3 Summary of Environmental Complaints

- 7.3.1 No environmental related complaint was received in the reporting period. Cumulative statistics on environmental complaints is provided in **Appendix J**.

7.4 Summary of Environmental Summon and Successful Prosecutions

- 7.4.1 No environmental related prosecution or notification of summons was received in the reporting period. Cumulative statistics on notification of summons and successful prosecutions is provided in **Appendix J**.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

- 8.1.1 24-hour TSP, 1-hour TSP and noise monitoring were carried out in the reporting period.
- 8.1.2 No Action and Limit Level exceedance was recorded for 24-hour TSP monitoring at the monitoring locations in the reporting period.
- 8.1.3 No Action and Limit Level exceedance was recorded for 1-hour TSP monitoring at the monitoring locations in the reporting period.
- 8.1.4 No Action Level exceedance was recorded since no noise related complaint was received in the reporting period.
- 8.1.5 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting period.
- 8.1.6 14 nos. of environmental site inspections were carried out in reporting period. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.
- 8.1.7 No environmental complaint was received in the reporting period.
- 8.1.8 No notification of summons and successful prosecution were received in the reporting period.
- 8.1.9 Referring to the Contractor's information, no notification of summons and successful prosecution was received in the reporting period.

8.2 Recommendations

- 8.2.1 According to the environmental site inspections performed in the reporting period, the following recommendations were provided: -

Air Quality Impact

- The Contractor was reminded to provide a cover or frequent watering for the open stockpile to prevent dust emission.

Construction Noise Impact

- No specific observation was identified in the reporting period.

Water Quality Impact

- The contractor was reminded to provide precautionary measures at the site boundaries to prevent any runoff from crossing the site.

Chemical and Waste Management

- The contractor was reminded to remove refuse regularly to maintain the cleanness of the site.

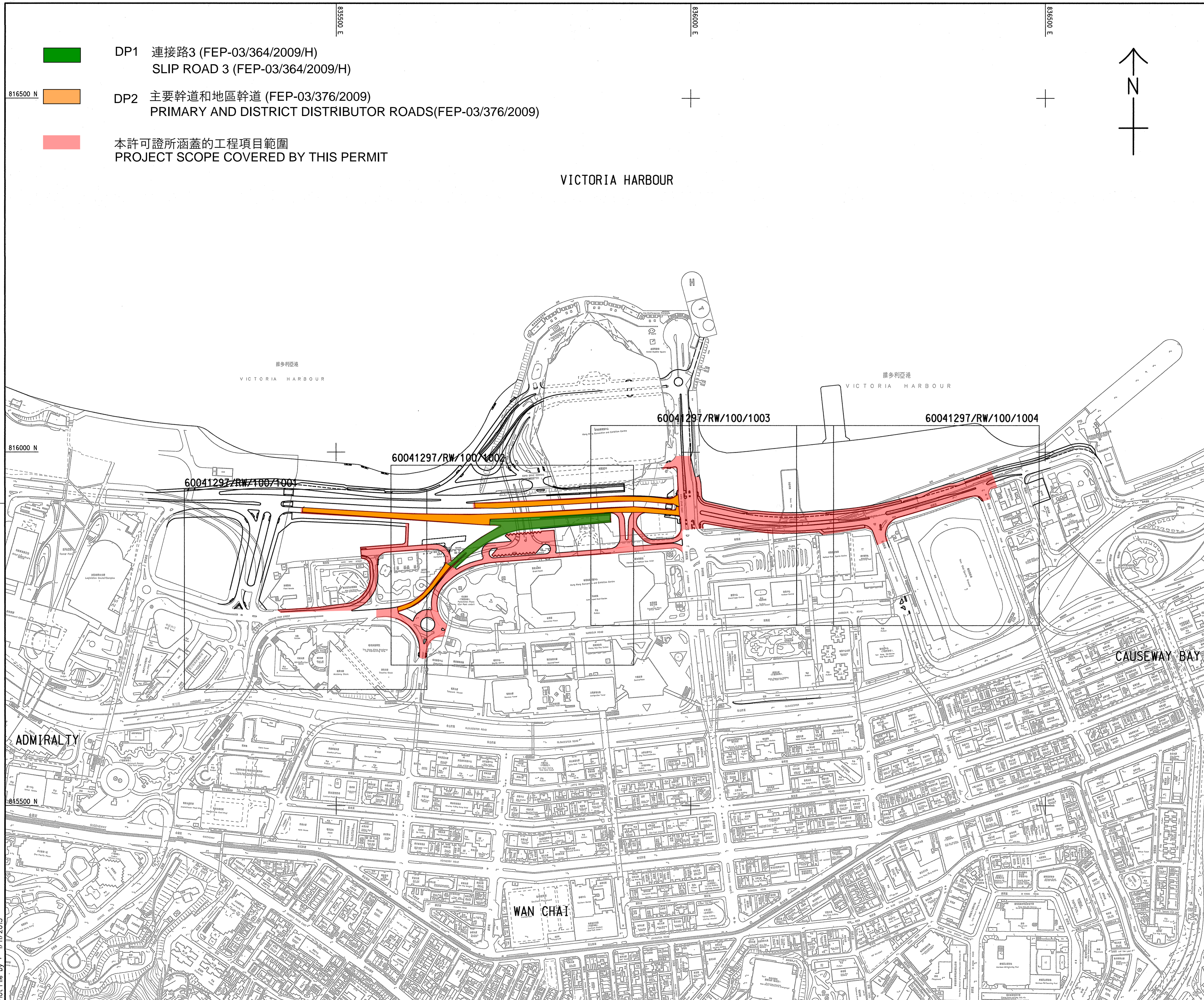
Landscape & Visual Impact

- No specific observation was identified in the reporting period.

Permits/licenses

- No specific observation was identified in the reporting period.

FIGURES



- DP1 連接路3 (FEP-03/364/2009/H)
SLIP ROAD 3 (FEP-03/364/2009/H)
- DP2 主要幹道和地區幹道 (FEP-03/376/2009)
PRIMARY AND DISTRICT DISTRIBUTOR ROADS(FEP-03/376/2009)
- 本許可證所涵蓋的工程項目範圍
PROJECT SCOPE COVERED BY THIS PERMIT

VICTORIA HARBOUR

60041297/RW/100/1001
60041297/RW/100/1002
60041297/RW/100/1003
60041297/RW/100/1004

ADMIRALTY

CAUSEWAY BAY

WAN CHAI

TENDER DRAWING	PSL	SLY	OCT	13
REV. NO.	DESCRIPTION	DATE	BY	CHK

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

CEDD ENTRUSTED WORKS

Site Layout Plan of CEDD
Entrusted Works under
Contract 1123

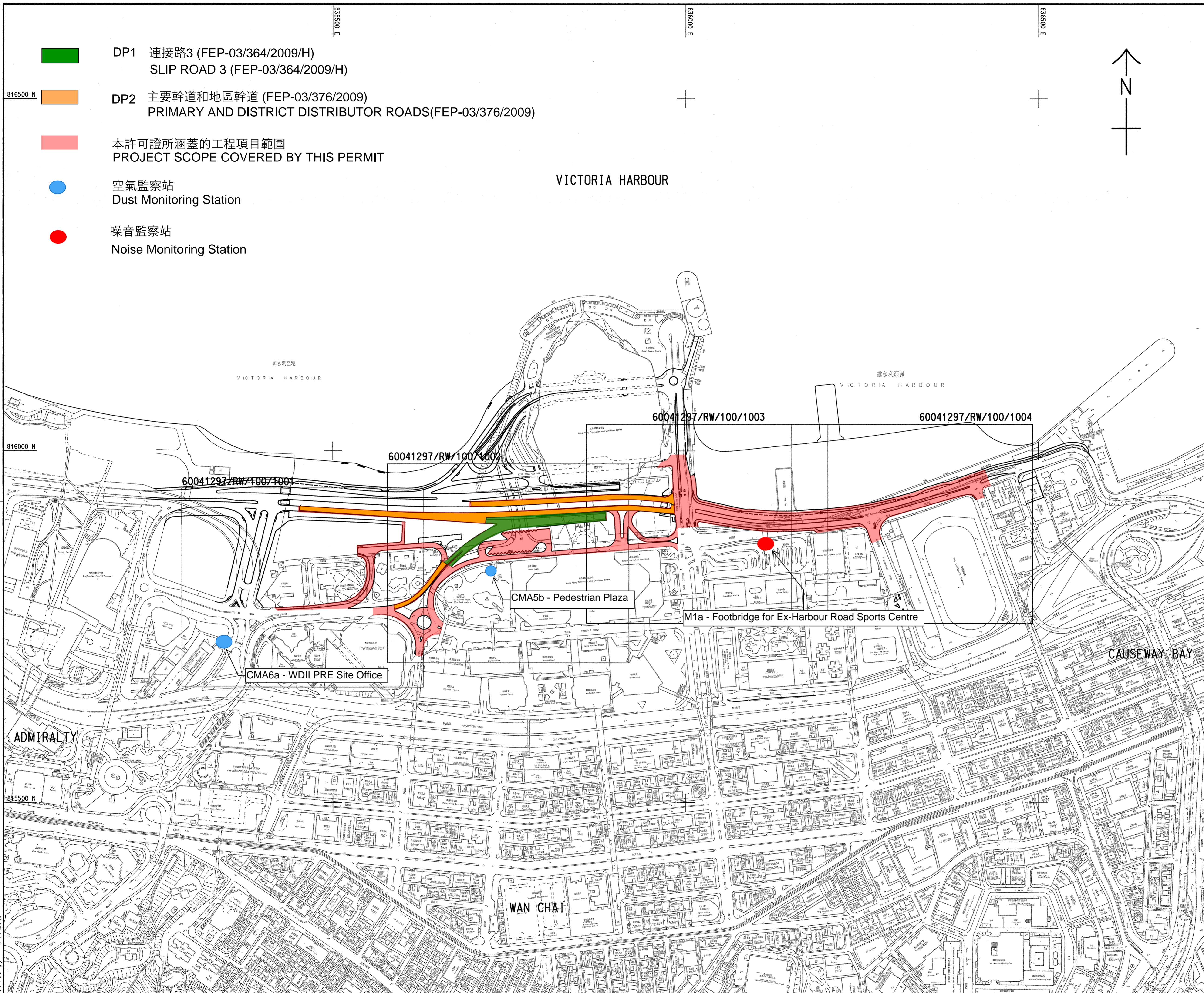
AECOM

DRG. NO. Figure 1.1
圖紙編號

DESIGNED BY 設計	CONTRACT NO. 合約編號	P. DIR. APPROVED 核准人
DRAWN BY 繪圖	STATUS 狀態	DATE 日期
SCALE 比例	DIMENSIONS ARE IN 大圖單位	
A1 1:2500	METRES	
© COPYRIGHT RESERVED 版權所有		

Plot File by : 1/11/2013

...RW_01000.dgn



- DP1 連接路3 (FEP-03/364/2009/H)
SLIP ROAD 3 (FEP-03/364/2009/H)
- DP2 主要幹道和地區幹道 (FEP-03/376/2009)
PRIMARY AND DISTRICT DISTRIBUTOR ROADS(FEP-03/376/2009)
- 本許可證所涵蓋的工程項目範圍
PROJECT SCOPE COVERED BY THIS PERMIT
- 空氣監察站
Dust Monitoring Station
- 噪音監察站
Noise Monitoring Station

TENDER DRAWING	PSL	SLY	OCT	13
REV. NO.	DESCRIPTION	DATE	BY	CHK.

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

Air Quality and Noise Monitoring
 Locations for CEDD Entrusted
 Works

AECOM

DRG. NO. 圖紙編號	Figure 3.1		
DESIGNED BY 設計	CONTRACT NO. 合約編號	P. DIR. APPROVED 批准人	
DRAWN BY 繪圖	STATUS 狀態	DATE 日期	
SCALE 比例	DIMENSIONS ARE IN 大牛單位		
A1 1:2500	METRES		
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Plot File by : 1/11/2013

...RW_01000.dgn

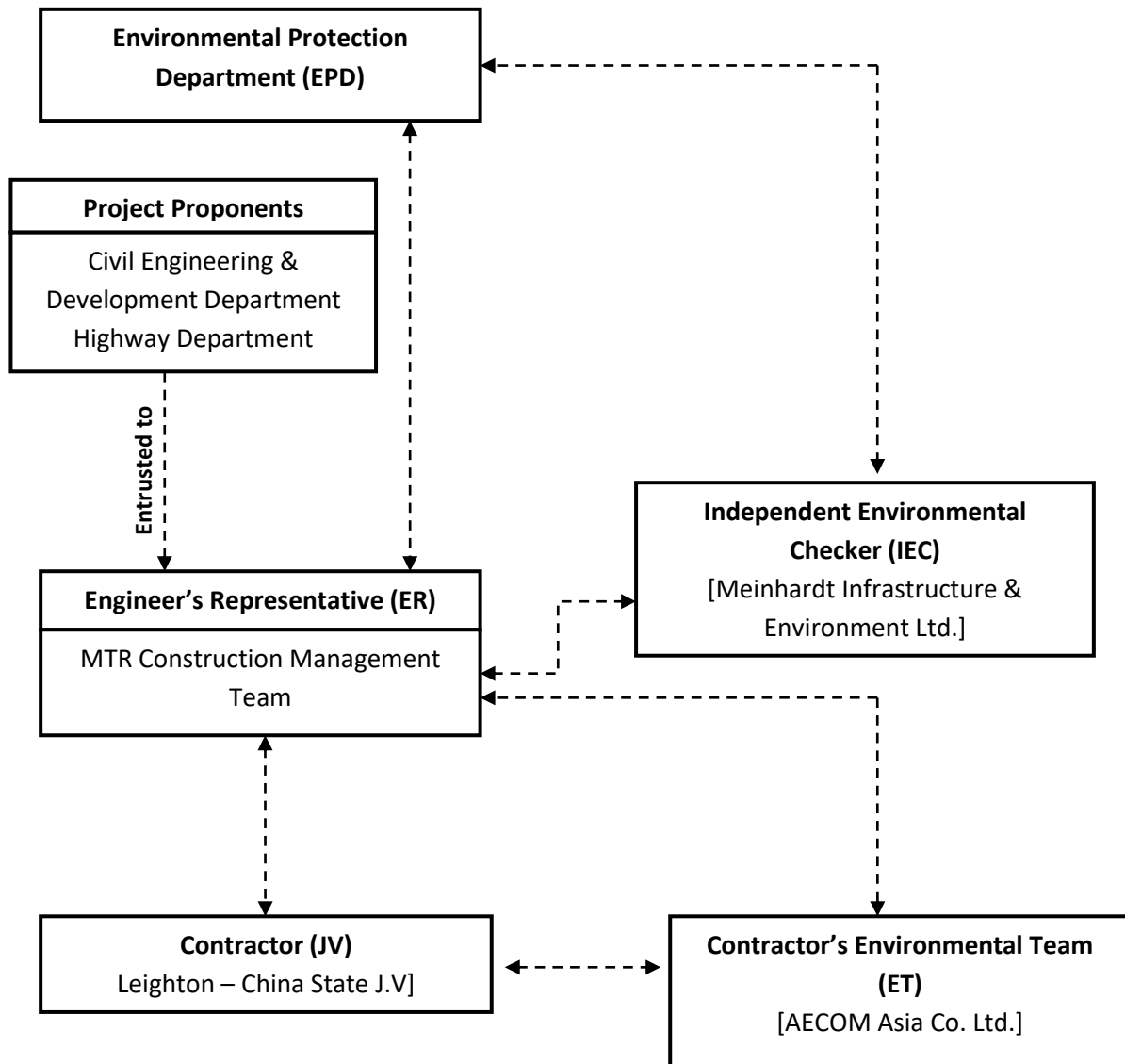
APPENDIX A

Construction Programme

APPENDIX B

Project Organization Structure

Appendix B Project Organisation Structure



APPENDIX C

**Implementation Schedule of Environmental Mitigation
Measures**

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Construction Dust Impact					
Construction Phase					
S3.6.5	Four times a day watering of the work site with active operations	Contractor	Works areas	Construction phase	V
S3.8.1	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 minimise cumulative dust impacts. <ul style="list-style-type: none"> • Strictly limit the truck speed on site to below 10 km per hour and water spraying to keep the haul roads in wet condition; • Watering during excavation and material handling; • Provision of vehicle wheel and body washing facilities at the exit points of the site, combined with cleaning of public roads where necessary; and • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. 	Contractor	Works areas	Construction phase	V @ V V
/	Dust suppression measures (con't) <ul style="list-style-type: none"> • De-bagging, batching and mixing processes carried out in sheltered areas during the use of bagged cement • The portion of any road where along the site boundary should be kept clear of dusty materials. • Use of frequent watering for any dusty construction process (e.g. breaking works) to reduce dust emissions. 	Contractor	Works areas	Construction phase	V V V
/	Emission from Vehicles and Plants <ul style="list-style-type: none"> • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD) 	Contractor	Works areas	Construction phase	V V V
Airborne Noise Impact					
Construction Phase					
S4.9.4	Good Site Practice: <ul style="list-style-type: none"> • Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program. • Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program. • Mobile plant, if any, shall be sited as far away from NSRs as possible. • Machines and plant (such as trucks) that may be in intermittent use shall be shut down between works periods or shall be throttled down to a minimum. • Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs. • Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from onsite construction activities. 	Contractor	Works areas	Construction phase	V V V V V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
For DP1 – CWB (Within the Project Boundary)					
S4.8.3 – S4.8.5	<p>Use of quiet powered mechanical equipment, movable noise barrier and temporary noise barrier for the following tasks:</p> <ul style="list-style-type: none"> Slip road 8 tunnel Construction of diaphragm wall and substructures of the tunnel approach ramp Excavation Construction of slabs Backfill Demolition and construction of substructures for the IEC Demolition works of existing piers and crossheads of the marine section of the existing IEC <p>Use of PME grouping for the following tasks:</p> <ul style="list-style-type: none"> At-grade roadwork Substructure for IECL connection 	Contractor	Works areas	Construction phase	N/A V V V N/A N/A N/A V N/A
For DP2 – WDII Major Roads (Road P2)					
S4.8.3 – S4.8.4	<p>Use of quiet powered mechanical equipment, movable noise barrier and temporary noise barrier for the following tasks:</p> <ul style="list-style-type: none"> Temporary road diversion Resurfacing At-grade roadwork 				V V V
Water Quality Impact					
Construction Phase					
S5.8	<p>Construction Runoff and Drainage:</p> <ul style="list-style-type: none"> Use of sediment traps, wheel washing facilities for vehicles leaving the site, and adequate maintenance of drainage systems to prevent flooding and overflow; Permanent drainage channels shall incorporate sediment basins or traps and baffles to enhance deposition rates. The design of efficient silt removal facilities shall be based on the guidelines in Appendix A1 of ProPECC PN 1/94; A sediment tank constructed from preformed individual cells of approximately 6 - 8 m³ capacity can be used for settling ground water prior to disposal; Oil interceptors shall be provided in the drainage system for the tunnels and regularly cleaned to prevent the release of oils and grease into the storm water drainage system after accidental spillages. The interceptor shall have a bypass to prevent flushing during periods of heavy rain; Precautions and actions to be taken when a rainstorm is imminent or forecast, and during or after rainstorms. Particular attention shall be paid to the control of any silty surface runoff during storm events; On-site drainage system shall be installed prior to the commencement of other construction activities. Sediment traps shall be installed in order to minimize the sediment loading of the effluent prior to discharge; All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge shall be adequately designed for the controlled release of storm flows. All sediment control measures shall be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rain storms. The temporarily diverted drainage shall be reinstated to its original condition when the construction work is finished or the temporary diversion is no longer required; All fuel tanks and store areas shall be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity; 	Contractor	Works areas	Construction phase	V V V V V V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
	<ul style="list-style-type: none"> Minimum distances of 100 m shall be maintained between the storm water discharges and the existing or planned WSD flushing water intakes during construction phase 				V
S5.8	<p>Sewage from Construction Work Force: Construction work force sewage discharges on site shall be connected to the existing trunk sewer or sewage treatment facilities. The construction sewage shall be handled by portable chemical toilets prior to the commission of the on-site sewer system. Appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the large number of construction workers over the construction site. The Contractor shall also be responsible for waste disposal and maintenance practices.</p>	Contractor	Works areas	Construction phase	V
S5.8	<p>Floating Debris and Refuse: Collection and removal of floating refuse shall be performed at regular intervals on a daily basis. The contractor shall be responsible for keeping the water within the site boundary and the neighbouring water free from rubbish.</p>	Contractor	Works areas and adjacent water	Construction phase	V
S5.8	<p>Storm Water Discharges: Minimum distances of 100 m shall be maintained between the existing or planned stormwater discharges and the existing or planned WSD flushing water intakes.</p>	Contractor	Works areas and adjacent water	Construction phase	V
Waste Management Implications					
Construction Phase					
S6.7.7	<p>Good Site Practices: Recommendations for good site practices during the construction activities include:</p> <ul style="list-style-type: none"> 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; Training of site personnel in proper waste management and chemical waste handling procedures; Provision of sufficient waste disposal points and regular collection for disposal; Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and A recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites). 	Contractor	Works areas	During planning and design stage, and construction stage	V V V V V V
S6.7.8	<p>Waste Reduction Measures: Recommendations to achieve waste reduction include:</p> <ul style="list-style-type: none"> Sort C&D waste from demolition of the existing waterfront structures to recover recyclable portions such as metals. 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. 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. Any unused chemicals or those with remaining functional capacity shall be recycled. Use of reusable non-timber formwork, such as in casting the tunnel box sections, to reduce the amount of C&D material. Prior to disposal of C&D waste, it is recommended that wood, steel and other metals shall be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill. Proper storage and site practices to minimise the potential for damage or contamination of construction materials. Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste. 	Contractor	Works areas	During planning and design stage, and construction stage	V V V V V V V

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
S6.7.10	<p>General Refuse:</p> <ul style="list-style-type: none"> General refuse shall be stored in enclosed bins or compaction units separate from C&D material. A licensed waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D material. A collection area shall be provided where wastes can be stored and loaded prior to removal from site. An enclosed and covered area is recommended to reduce the occurrence of 'wind blow' light material. 	Contractor	Works areas	Construction phase	@ V
S6.7.11	<p>Chemical Wastes:</p> <p>After use, chemical wastes (for example, cleaning fluids, solvents, lubrication oil and fuel) shall be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Spent chemicals shall be collected by a licensed collector for disposal at the CWTF or other licensed facility in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</p>	Contractor	Works areas	Construction phase	V
S6.7.12 – S6.7.13	<p>Construction and Demolition Material:</p> <ul style="list-style-type: none"> C&D material shall be sorted on-site into inert C&D material (that is, public fill) and C&D waste. All the suitable inert C&D material shall be broken down to 250 mm in size for reuse as public fill in the WDII reclamation. C&D waste, such as wood, glass, plastic, steel and other metals shall be reused or recycled and, as a last resort, disposed of to landfill. A suitable area shall be designated to facilitate the sorting process and a temporary stockpiling area will be required for the separated materials. In order to monitor the disposal of public fill and C&D waste at public fill reception facilities and landfills, respectively, and to control fly tipping, a trip-ticket system shall be included as one of the contractual requirements and implemented by the Environmental Team undertaking the environmental monitoring and audit work. An Independent Environment Checker shall be responsible for auditing the results of the system. 	Contractor	Works areas	Construction phase	V V
S6.7.14	<p>Bentonite Slurry:</p> <p>The disposal of residual used bentonite slurry shall follow the good practice guidelines stated in ProPECC PN 1/94 "Construction Site Drainage" and listed as follows:</p> <ul style="list-style-type: none"> If the disposal of a certain residual quantity cannot be avoided, the used slurry may be disposed of at the marine spoil grounds subject to obtaining a marine dumping licence from EPD on a case-by-case basis. If the used bentonite slurry is intended to be disposed of through the public drainage system, it shall be treated to the respective effluent standards applicable to foul sewers, storm drains or the receiving waters as set out in the Technical Memorandum of Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters. If the used bentonite slurry is intended to be disposed to public fill reception facilities, it will be mixed with dry soil on site before disposal. 	Contractor	Works areas	Construction phase	N/A N/A N/A
/	<p>Accidental spillage</p> <p>To prevent accidental spillage of chemicals, the following is recommended:</p> <ul style="list-style-type: none"> Proper storage and handling facilities will be provided. All the tanks, containers, storage area will be bunded and the locations will be locked as far as possible from the sensitive watercourse and stormwater drains. The contractor will register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities will be stored with suitable labels and warnings. Disposal of chemical wastes will be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation. 	Contractor	Works areas	Construction phase	V V V V
Land Contamination Impact					
S.7.1.1	As no potential contaminative land uses were identified within the Study Area, adverse land contamination impacts associated with the construction and operation of the Project is not expected. As such, environmental protection and mitigation measures are considered not necessary and will not be covered in this EM&A Manual.	-	-	-	N/A

Appendix C – Environmental Mitigation Implementation Schedule

EIA Ref.	Recommended Mitigation Measures	Who to implement the measures?	Location of the measure	When to implement the measures?	Implementation Status
Landscape and Visual					
Construction Phase					
For DP1 – CWB (Within the Project Boundary) and DP2 - WDII Major Roads (Road P2)					
Table 10.5	CM1 - Topsoil, where identified, shall be stripped and stored for re-use in the construction of the soft landscape works, where practical. CM2 - Existing trees to be retained on site shall be carefully protected during construction. CM3 - Trees unavoidably affected by the works shall be transplanted where practical. CM4 - Compensatory tree planting shall be provided to compensate for felled trees. CM5 - Control of night-time lighting. CM6 - Erection of decorative screen hoarding compatible with the surrounding setting.	Contractor	Works areas	Construction phase	V N/A N/A N/A V N/A

Legend: V = implemented;
 x = not implemented;
 @ = partially implemented;
 N/A = not applicable

APPENDIX D

Summary of Action and Limit Levels

Appendix D – Summary of Action and Limit Levels**Table 1 Action and Limit Levels for 24-hour TSP**

ID	Location	Action Level	Limit Level
CMA5b	Pedestrian Plaza	209.9 $\mu\text{g}/\text{m}^3$	260 $\mu\text{g}/\text{m}^3$
CMA6a	WDII PRE Site Office	207.1 $\mu\text{g}/\text{m}^3$	260 $\mu\text{g}/\text{m}^3$

Table 2 Action and Limit Levels for 1-hour TSP

ID	Location	Action Level	Limit Level
CMA5b	Pedestrian Plaza	339.7 $\mu\text{g}/\text{m}^3$	500 $\mu\text{g}/\text{m}^3$
CMA6a	WDII PRE Site Office	333 $\mu\text{g}/\text{m}^3$	500 $\mu\text{g}/\text{m}^3$

**Table 3 Action and Limit Levels for Construction Noise
(0700 – 1900 hrs of normal weekdays)**

ID	Location	Action Level	Limit Level
M1a	Footbridge at EX-Wanchai Harbour Road Sports Centre	When one documented complaint is received	75 dB(A)

APPENDIX E

Calibration Certificates of Equipments



RECALIBRATION
DUE DATE:
January 7, 2022

Certificate of Calibration

Calibration Certification Information			
Cal. Date:	January 7, 2021	Rootsmeter S/N:	438320
Operator:	Jim Tisch	Ta:	294 °K
Calibration Model #:	TE-5025A	Pa:	756.4 mm Hg
		Calibrator S/N:	0843

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3970	4.2	2.00
2	3	4	1	0.9930	6.4	4.00
3	5	6	1	0.8790	8.0	5.00
4	7	8	1	0.8420	8.7	5.50
5	9	10	1	0.6950	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)
1.0032	0.7181	1.4204	0.9944	0.7118	0.8817
1.0003	1.0073	2.0088	0.9915	0.9985	1.2469
0.9982	1.1356	2.2459	0.9894	1.1256	1.3941
0.9972	1.1843	2.3555	0.9885	1.1740	1.4621
0.9919	1.4272	2.8409	0.9832	1.4147	1.7634
QSTD	m=	1.99914	QA	m=	1.25183
	b=	-0.01375		b=	-0.00854
	r=	0.99991		r=	0.99991

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

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

RECALIBRATION

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

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

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



RECALIBRATION
DUE DATE:
December 27, 2022

Certificate of Calibration

Calibration Certification Information			
Cal. Date:	December 27, 2021	Rootsmeter S/N:	438320
Operator:	Jim Tisch	Ta:	295 °K
Calibration Model #:	TE-5025A	Pa:	740.4 mm Hg
		Calibrator S/N:	0843

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3770	3.2	2.00
2	3	4	1	0.9710	6.4	4.00
3	5	6	1	0.8740	7.9	5.00
4	7	8	1	0.8340	8.8	5.50
5	9	10	1	0.6870	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)
0.9799	0.7116	1.4029	0.9957	0.7231	0.8927
0.9756	1.0048	1.9841	0.9914	1.0210	1.2624
0.9736	1.1140	2.2183	0.9893	1.1320	1.4114
0.9724	1.1660	2.3265	0.9881	1.1848	1.4803
0.9673	1.4079	2.8059	0.9828	1.4306	1.7853
QSTD	m=	2.02086	QA	m=	1.26543
	b=	-0.03672		b=	-0.02336
	r=	0.99992		r=	0.99992

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

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

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Village of Cleves, OH 45002

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

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station: WDII PRE Site Office Operator: Shum Kam Yuen
 Cal. Date: 15 Sep 2021 Next Due Date: 15 Nov 2021
 Equipment No.: A-001-79T Serial No.: 3384

Ambient Condition			
Temperature, Ta (K)	303.0	Pressure, Pa (mmHg)	757.2

Orifice Transfer Standard Information					
Serial No.:	843	Slope, mc	1.99914	Intercept, bc	-0.1375
Last Calibration Date:	7 Jan 2021	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$ $Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			
Next Calibration Date:	7 Jan 2022				

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.0	2.62	1.38	45.0	44.54
13	6.0	2.42	1.28	40.0	39.60
10	4.5	2.10	1.12	33.0	32.67
7	3.1	1.74	0.94	24.0	23.76
5	2.4	1.53	0.84	20.0	19.80

By Linear Regression of Y on X
 Slope, mw = 45.8197 Intercept, bw = -18.8437
 Correlation Coefficient* = 0.9987
 *If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m³/min
 From the Regression Equation, the "Y" value according to

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

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]^{1/2} = 41.14

Remarks: _____

QC Reviewer: WS CHAN Signature: [Signature] Date: 15/9/21

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station: WDII PRE Site Office Operator: Shum Kam Yuen
 Cal. Date: 15 Nov 2021 Next Due Date: 15 Jan 2022
 Equipment No.: A-001-79T Serial No.: 3384

Ambient Condition			
Temperature, Ta (K)	298.0	Pressure, Pa (mmHg)	761.6

Orifice Transfer Standard Information					
Serial No.:	843	Slope, mc	1.99914	Intercept, bc	-0.1375
Last Calibration Date:	7 Jan 2021	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$ $Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			
Next Calibration Date:	7 Jan 2022				

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	6.9	2.63	1.38	45.0	45.05
13	5.9	2.43	1.29	40.0	40.04
10	4.5	2.12	1.13	34.0	34.04
7	3.0	1.73	0.94	25.0	25.03
5	2.4	1.55	0.84	20.0	20.02

By Linear Regression of Y on X
 Slope, mw = 45.4352 Intercept, bw = -17.8786
 Correlation Coefficient* = 0.9980
 *If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m³/min
 From the Regression Equation, the "Y" value according to

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

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]^{1/2} = 41.14

Remarks: _____

QC Reviewer: WS CHAN Signature: [Signature] Date: 15/11/2021

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station: WDII PRE Site Office Operator: Shum Kam Yuen
 Cal. Date: 14 Jan 2022 Next Due Date: 14 Mar 2022
 Equipment No.: A-001-79T Serial No.: 3384

Ambient Condition			
Temperature, Ta (K)	291.0	Pressure, Pa (mmHg)	755.1

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	2.02086	Intercept, bc	-0.03672
Last Calibration Date:	27 Dec 2021	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	27 Dec 2022	$Qstd = \{ [DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc \} / mc$			

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	7.1	2.69	1.35	45.0	45.39
13	6.0	2.47	1.24	40.0	40.35
10	4.5	2.14	1.08	33.0	33.29
7	3.0	1.75	0.88	25.0	25.22
5	2.3	1.53	0.78	20.0	20.17

By Linear Regression of Y on X
 Slope, mw = 43.5060 Intercept, bw = -13.4405
 Correlation Coefficient* = 0.9996
 *If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m³/min
 From the Regression Equation, the "Y" value according to

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

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]^{1/2} = 42.75

Remarks: _____

QC Reviewer: WIS CHAN Signature: [Signature] Date: 14/01/22

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station Pedestrian Plaza Operator: Choi Wing Ho
 Cal. Date: 15-Oct-21 Next Due Date: 15-Dec-21
 Equipment No.: A-001-70T Serial No. 10273

Ambient Condition			
Temperature, Ta (K)	300	Pressure, Pa (mmHg)	756.6

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	1.99914	Intercept, bc	-0.01375
Last Calibration Date:	07-Jan-21	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	07-Jan-22				

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	6.8	2.59	1.30	44.0	43.75
13	5.6	2.35	1.18	38.0	37.79
10	4.6	2.13	1.07	33.0	32.82
7	3.5	1.86	0.94	26.0	25.86
5	2.6	1.60	0.81	20.0	19.89

By Linear Regression of Y on X
 Slope, mw = 48.2634 Intercept, bw = -19.2178
 Correlation Coefficient* = 0.9997
 *If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m³/min
 From the Regression Equation, the "Y" value according to

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

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]^{1/2} = 43.77

Remarks: _____

QC Reviewer: WS CHAN Signature: PC Date: 15/10/21

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station Pedestrian Plaza Operator: Choi Wing Ho
 Cal. Date: 14-Dec-21 Next Due Date: 14-Feb-22
 Equipment No.: A-001-70T Serial No. 10273

Ambient Condition			
Temperature, Ta (K)	295	Pressure, Pa (mmHg)	755.9

Orifice Transfer Standard Information					
Serial No:	843	Slope, mc	1.99914	Intercept, bc	-0.01375
Last Calibration Date:	07-Jan-21	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	07-Jan-22				

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	$[DH \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m ³ /min) X-axis	Flow Recorder Reading (CFM)	Continuous Flow Recorder Reading IC (CFM) Y-axis
18	6.9	2.63	1.32	44.0	44.10
13	5.6	2.37	1.19	38.0	38.09
10	4.7	2.17	1.09	33.0	33.08
7	3.5	1.88	0.94	27.0	27.06
5	2.6	1.62	0.82	21.0	21.05

By Linear Regression of Y on X
 Slope, mw = 45.0719 Intercept, bw = -15.7435
 Correlation Coefficient* = 0.9990
 *If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.30m³/min
 From the Regression Equation, the "Y" value according to

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

Therefore, Set Point; IC = (mw x Qstd + bw) x [(760 / Pa) x (Ta / 298)]^{1/2} = 42.75

Remarks: _____

QC Reviewer: WS CHAN Signature: PC Date: 14/12/21

EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor
 Manufacturer/Brand: SIBATA
 Model No.: LD-3
 Equipment No.: A.005.10a
 Sensitivity Adjustment Scale Setting: 753 CPM

Operator: Mike Shek (MSKM)

Standard Equipment

Equipment: High Volume Sampler
 Venue: Fanling Government Secondary School
 Model No.: TE-5170
 Serial No.: 3154
 Last Calibration Date: 23-Apr-21

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): 753 CPM
 Sensitivity Adjustment Scale Setting (After Calibration): 753 CPM

Hour	Date (dd/mm/yy)	Time	Ambient Condition		Concentration ^① (mg/m3) Y-axis	Total Count ^②	Count/ Minute ^③ X-axis
			Temp (°C)	R.H.(%)			
1	30/04/21	9:30-10:30	28.0	78	0.04950	1945	32.42
2	30/04/21	10:30-11:30	28.0	78	0.05045	2010	33.50
3	30/04/21	11:30-12:30	28.0	78	0.05250	2110	35.17
4	30/04/21	12:30-13:30	28.0	78	0.05520	2310	38.50

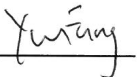

Note: ① Monitoring data was measured by High Volume Sampler
 ② Total Count was logged by Laser Dust Monitor
 ③ Count/minute was calculated by (Total Count/60)

By Linear Regression of Y on X

Slope (K-factor): 0.0015
 Correlation coefficient: 0.9994

Validity of Calibration Record: 30-Apr-22

Remarks:

QC Reviewer:  Signature:  Date: 3-May-21



CERTIFICATE OF CALIBRATION

Certificate No.: 21CA0309 02 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	, Microphone	Pream
Manufacturer:	B & K	, B & K	B & K
Type/Model No.:	2270	, 4950	ZC0032
Serial/Equipment No.:	2644597	, 2879980	29398
Adaptors used:	-	, -	-

Item submitted by

Customer Name: AECOM ASIA CO LTD
Address of Customer: -
Request No.: -
Date of receipt: 09-Mar-2021

Date of test: 22-Mar-2021

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2021	CIGISMEC
Signal generator	DS 360	33873	19-May-2021	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 1005 ± 5 hPa

Test specifications

- The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
- The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsiveness of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:  Date: 24-Mar-2021 Company Chop: 

Comments: The results 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. The results apply to the item as received.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 21CA0309 02 Page 2 of 2

1, Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Uncertainty (dB) / Coverage Factor
Self-generated noise	A	Pass	0.3
	C	Pass	1.0 2.1
	Lin	Pass	2.0 2.2
Linearity range for Leq	At reference range, Step 5 dB at 4 kHz	Pass	0.3
	Reference SPL on all other ranges	Pass	0.3
	2 dB below upper limit of each range	Pass	0.3
	2 dB above lower limit of each range	Pass	0.3
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3
	Frequency weightings	A	Pass 0.3
Time weightings	C	Pass 0.3	
	Lin	Pass 0.3	
	Single Burst Fast	Pass 0.3	
Peak response	Single Burst Slow	Pass 0.3	
	Single 100µs rectangular pulse	Pass 0.3	
	R.M.S. accuracy	Crest factor of 3	Pass 0.3
	Time weighting I	Single burst 5 ms at 2000 Hz	Pass 0.3
Time averaging	Repeated at frequency of 100 Hz	Pass 0.3	
	1 ms burst duty factor 1/10 ³ at 4kHz	Pass 0.3	
	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass 0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass 0.4	
	Sound exposure level	Single burst 10 ms at 4 kHz	Pass 0.4
Overload indication	SPL	Pass 0.3	
	Leq	Pass 0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Uncertainty (dB) / Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3
	Weighting A at 8000 Hz	Pass	0.5

3, Response to associated sound calibrator

N/A

The uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95 %. A coverage factor of 2 is assumed unless explicitly stated.

Calibrated by:  Date: 22-Mar-2021
Checked by:  Date: 24-Mar-2021

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



CERTIFICATE OF CALIBRATION

Certificate No.: 21CA0319 01-01 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250-L	4950	ZC0032
Serial/Equipment No.:	2681366	2665582	17190
Adaptors used:	-	-	-

Item submitted by

Customer Name: AECOM ASIA CO LTD
 Address of Customer: -
 Request No.: -
 Date of receipt: 19-Mar-2021

Date of test: 23-Mar-2021

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2021	CIGISMEC
Signal generator	DS 360	33873	19-May-2021	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
 Relative humidity: 55 ± 10 %
 Air pressure: 1005 ± 5 hPa

Test specifications

- The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMP004-CA-152.
- The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±20%.
- The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responsiveness of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:  Date: 24-Mar-2021 Company Chop: 

Comments: The results 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. The results apply to the item as received.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 21CA0319 01-01 Page 2 of 2

1, Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	0.8	
	Lin	Pass	1.6	
Linearity range for Leq	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	Frequency weightings			
Time weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Peak response	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
R.M.S. accuracy	Single 100µs rectangular pulse	Pass	0.3	
	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
	Single burst 10 ms at 4 kHz	Pass	0.4	
Sound exposure level	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests


The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

Calibrated by: 

Date: 23-Mar-2021

Checked by: 

Date: 24-Mar-2021

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



CERTIFICATE OF CALIBRATION

Certificate No.: 21CA0319 01-02 Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
Manufacturer: MVI
Type/Model No.: CAL21
Serial/Equipment No.: 34113610(2011) / N.004.11
Adaptors used: Yes (BAC21)

Item submitted by

Customer: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 19-Mar-2021

Date of test: 23-Mar-2021

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	11-May-2021	SCL
Pre-amplifier	B&K 2673	2743150	03-Jun-2021	CEPREI
Measuring amplifier	B&K 2610	2346941	03-Jun-2021	CEPREI
Signal generator	DS 360	33873	19-May-2021	CEPREI
Digital multi-meter	34401A	US36087050	19-May-2021	CEPREI
Audio analyzer	8903B	GB41300350	18-May-2021	CEPREI
Universal counter	53132A	MY40003662	18-May-2021	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 1005 ± 5 hPa

Test specifications

- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:  Date: 24-Mar-2021 Company Chop: 

Comments: The results 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. The results apply to the item as received.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 21CA0319 01-02 Page: 2 of 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	(Output level in dB re 20 µPa)
			Estimated Expanded Uncertainty dB
1000	94.00	93.98	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz STF = 0.010 dB
Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz Actual Frequency = 1002.6 Hz
Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz TND = 1.8 %
Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

Calibrated by:  Date: 23-Mar-2021
Checked by:  Date: 24-Mar-2021

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



CERTIFICATE OF CALIBRATION

Certificate No.: 21CA0401 02 Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
 Manufacturer: B & K
 Type/Model No.: 4231
 Serial/Equipment No.: 3006428
 Adaptors used: -

Item submitted by

Customer: AECOM
 Address of Customer: -
 Request No.: -
 Date of receipt: 01-Apr-2021

Date of test: 05-Apr-2021

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2412857	11-May-2021	SCL
Preamplifier	B&K 2673	2743150	03-Jun-2021	CEPREI
Measuring amplifier	B&K 2610	2346941	03-Jun-2021	CEPREI
Signal generator	DS 360	33873	19-May-2021	CEPREI
Digital multi-meter	34401A	US36087050	19-May-2021	CEPREI
Audio analyzer	8903B	GB41300350	18-May-2021	CEPREI
Universal counter	53132A	MY40003662	18-May-2021	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
 Relative humidity: 55 ± 10 %
 Air pressure: 1010 ± 5 hPa

Test specifications

- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:  Date: 07-Apr-2021 Company Chop: 

Comments: The results 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. The results apply to the item as received.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 21CA0401 02 Page: 2 of 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	(Output level in dB re 20 µPa) Estimated Expanded Uncertainty dB
1000	94.00	94.23	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz STF = 0.016 dB

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz Actual Frequency = 999.95 Hz

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2


4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:


At 1000 Hz TND = 0.3 %

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

Calibrated by:  Date: 05-Apr-2021

- End -

Checked by:  Date: 07-Apr-2021

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.

APPENDIX F

EM&A Monitoring Schedules

**Shatin to Central Link 1123 - CEDD Entrusted Work
Road P2 & other roads and Slip Road 3
Tentative Impact Monitoring Schedule for November 2021**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov
	1-hour TSP	Noise			24-hour TSP	1-hour TSP
7-Nov	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov
				24-hour TSP Noise	1-hour TSP	
14-Nov	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov
			24-hour TSP Noise	1-hour TSP		
21-Nov	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov
		24-hour TSP	1-hour TSP	Noise		
28-Nov	29-Nov	30-Nov				
	24-hour TSP	1-hour TSP				

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station

CMA5b Pedestrian Plaza
CMA6a WDII PRE site office

Noise Monitoring Station

M1a Footbridge for Ex-Harbour Road Sports Centre

Monitoring Frequency

24-hr TSP Once every 6 days
1-hr TSP 3 times every 6 days (as required in of complaints)

Monitoring Frequency

Once per week

**Shatin to Central Link 1123 - CEDD Entrusted Work
Road P2 & other roads and Slip Road 3
Tentative Impact Monitoring Schedule for December 2021**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1-Dec	2-Dec	3-Dec	4-Dec
			Noise			24-hour TSP
5-Dec	6-Dec	7-Dec	8-Dec	9-Dec	10-Dec	11-Dec
	1-hour TSP	Noise			24-hour TSP	1-hour TSP
12-Dec	13-Dec	14-Dec	15-Dec	16-Dec	17-Dec	18-Dec
	Noise			24-hour TSP	1-hour TSP	
19-Dec	20-Dec	21-Dec	22-Dec	23-Dec	24-Dec	25-Dec
		24-hour TSP Noise	1-hour TSP		24-hour TSP	
26-Dec	27-Dec	28-Dec	29-Dec	30-Dec	31-Dec	
		1-hour TSP		24-hour TSP Noise		

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station

CMA5b Pedestrian Plaza
CMA6a WDII PRE site office

Noise Monitoring Station

M1a Footbridge for Ex-Harbour Road Sports Centre

Monitoring Frequency

24-hr TSP Once every 6 days
1-hr TSP 3 times every 6 days (as required in of complaints)

Monitoring Frequency

Once per week

**Shatin to Central Link 1123 - CEDD Entrusted Work
Road P2 & other roads and Slip Road 3
Tentative Impact Monitoring Schedule for January 2022**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Jan
2-Jan	3-Jan	4-Jan	5-Jan	6-Jan	7-Jan	8-Jan
			24-hour TSP	1-hour TSP	Noise	
9-Jan	10-Jan	11-Jan	12-Jan	13-Jan	14-Jan	15-Jan
		24-hour TSP	1-hour TSP	Noise		
16-Jan	17-Jan	18-Jan	19-Jan	20-Jan	21-Jan	22-Jan
	24-hour TSP	1-hour TSP	Noise			24-hour TSP
23-Jan	24-Jan	25-Jan	26-Jan	27-Jan	28-Jan	29-Jan
	1-hour TSP		Noise		24-hour TSP	1-hour TSP
30-Jan	31-Jan					
	24-hour TSP Noise					

The schedule is subject to change due to unforeseeable circumstances (e.g. adverse weather, etc)

Air Quality Monitoring Station

CMA5b Pedestrian Plaza
CMA6a WDII PRE site office

Noise Monitoring Station

M1a Footbridge for Ex-Harbour Road Sports Centre

Monitoring Frequency

24-hr TSP Once every 6 days
1-hr TSP 3 times every 6 days (as required in of complaints)

Monitoring Frequency

Once per week

APPENDIX G

**Air Quality Monitoring Results and
their Graphical Presentations**

Appendix G
Air Quality Monitoring Results

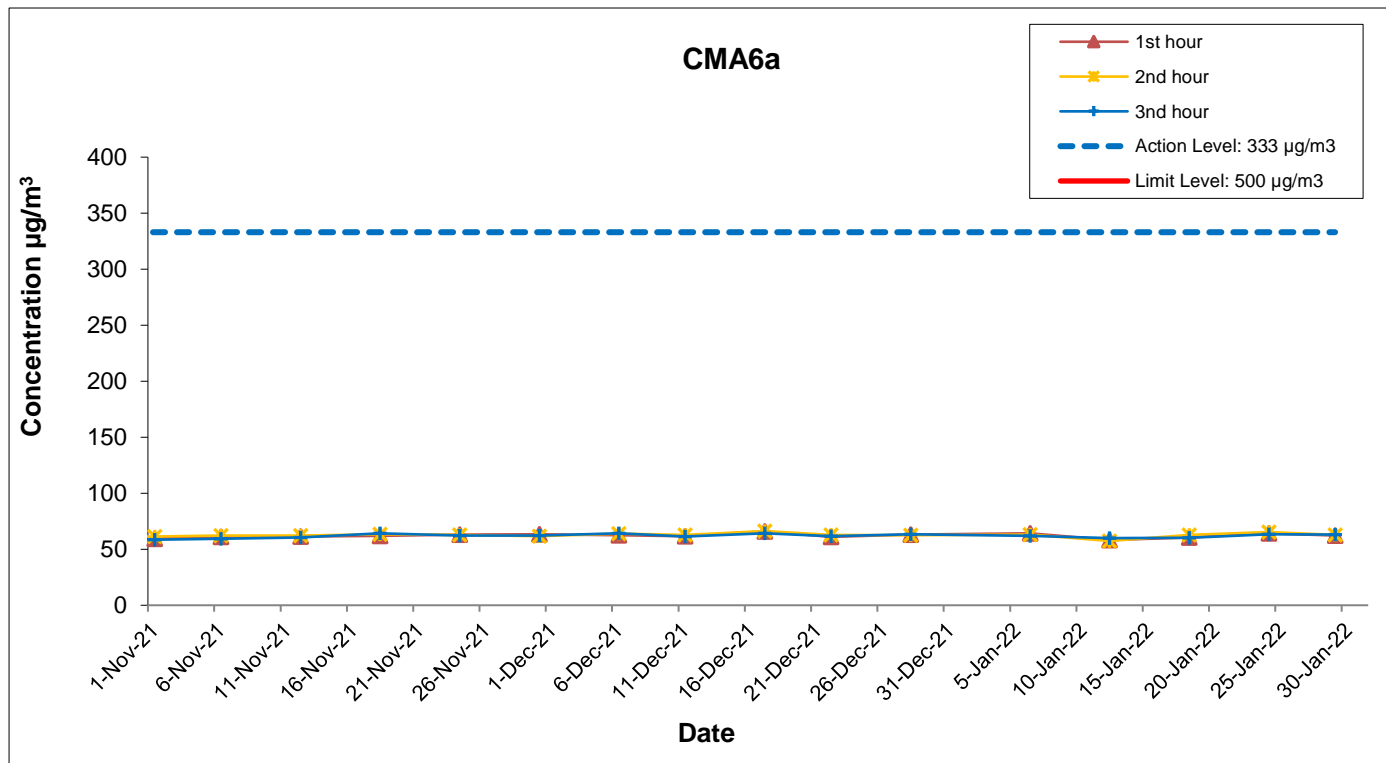
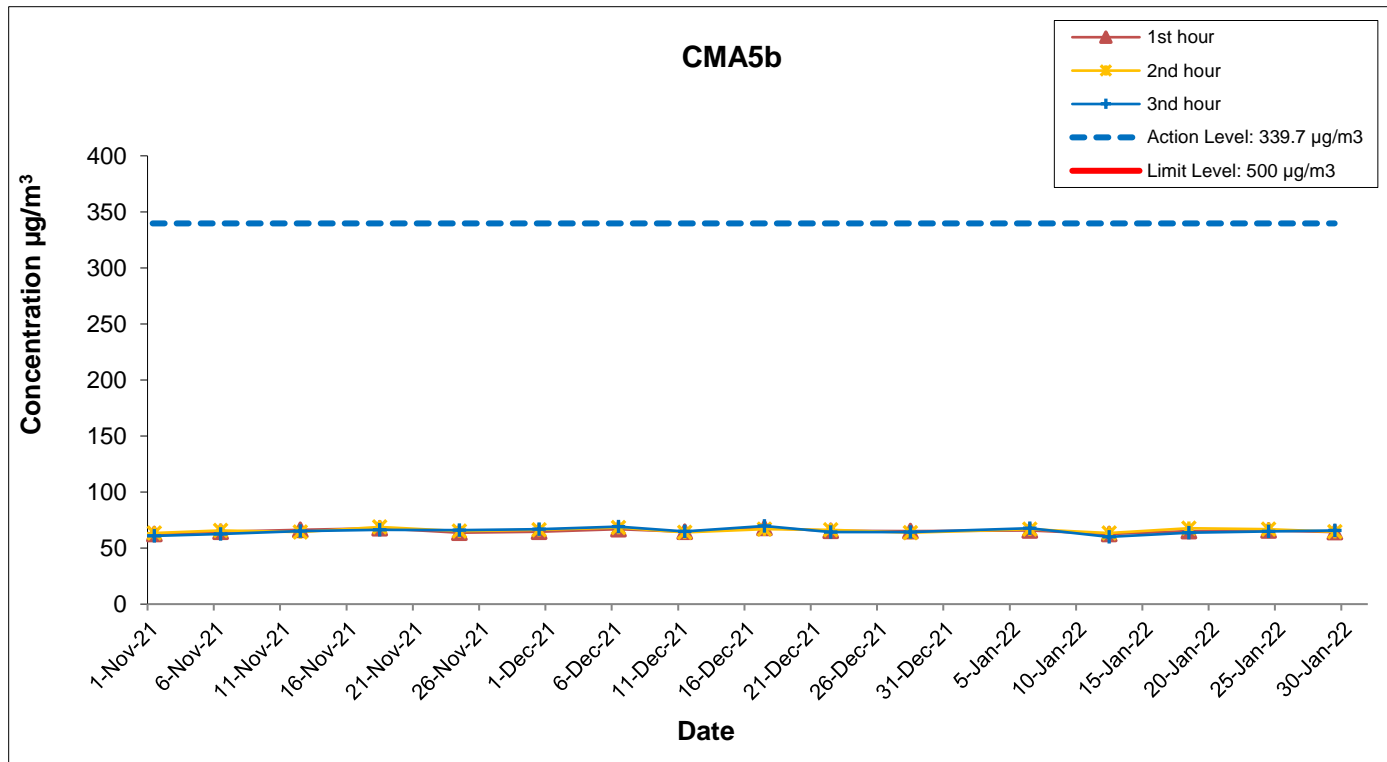
1-hour TSP Monitoring Results at Station CMA5b (Pedestrian Plaza)

Date	Start Time (hh:mm)	Weather Condition	1st Hour	2nd Hour	3rd Hour
			Conc. ($\mu\text{g}/\text{m}^3$)	Conc. ($\mu\text{g}/\text{m}^3$)	Conc. ($\mu\text{g}/\text{m}^3$)
01-Nov-21	10:15	Sunny	62.6	63.4	60.9
06-Nov-21	14:20	Sunny	64.6	65.7	62.7
12-Nov-21	10:45	Sunny	66.2	64.3	65.1
18-Nov-21	13:10	Sunny	67.8	68.8	66.2
24-Nov-21	13:25	Sunny	63.7	65.2	65.9
30-Nov-21	11:45	Sunny	64.6	66.2	66.9
06-Dec-21	14:25	Sunny	66.9	68.4	69.1
11-Dec-21	13:45	Fine	64.5	63.9	64.8
17-Dec-21	10:30	Sunny	68.1	66.9	69.8
22-Dec-21	14:10	Sunny	65.4	66.4	64.3
28-Dec-21	11:10	Fine	65.1	63.7	64.4
06-Jan-22	14:30	Sunny	65.7	66.9	67.8
12-Jan-22	10:45	Sunny	62.6	63.4	60.1
18-Jan-22	14:50	Sunny	65.1	67.7	63.8
24-Jan-22	14:30	Fine	65.7	67.0	65.0
29-Jan-22	11:10	Fine	64.3	64.5	65.6
				Average	65.4
				Min	60.1
				Max	69.8

Appendix G
Air Quality Monitoring Results

1-hour TSP Monitoring Results at Station CMA6a (WDII PRE Site Office)

Date	Start Time (hh:mm)	Weather Condition	1st Hour	2nd Hour	3rd Hour
			Conc. ($\mu\text{g}/\text{m}^3$)	Conc. ($\mu\text{g}/\text{m}^3$)	Conc. ($\mu\text{g}/\text{m}^3$)
01-Nov-21	10:00	Sunny	59.4	61.3	58.5
06-Nov-21	14:05	Sunny	61.1	62.2	59.5
12-Nov-21	10:30	Sunny	61.4	62.2	60.6
18-Nov-21	13:00	Sunny	61.9	63.3	64.1
24-Nov-21	13:40	Sunny	63.0	62.8	62.1
30-Nov-21	11:35	Sunny	63.3	61.6	62.2
06-Dec-21	14:30	Sunny	62.6	63.9	64.2
11-Dec-21	14:00	Fine	61.7	62.7	61.3
17-Dec-21	10:45	Sunny	65.9	66.1	64.2
22-Dec-21	14:00	Sunny	61.1	62.9	61.8
28-Dec-21	11:00	Fine	63.0	62.5	63.5
06-Jan-22	14:15	Sunny	64.1	63.0	61.9
12-Jan-22	10:30	Sunny	58.2	57.4	59.8
18-Jan-22	14:40	Sunny	60.4	62.8	60.2
24-Jan-22	14:20	Fine	64.1	65.3	63.3
29-Jan-22	11:25	Fine	62.1	62.8	63.1
				Average	62.2
				Min	57.4
				Max	66.1



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Shatin Central Link Contract No. 1123
 Entrusted Work for Road P2 & other roads and Slip Road 3



Graphical Presentation of Impact 1-hr TSP Monitoring Results

Date: March 2022

Appendix G

Appendix G
Air Quality Monitoring Results

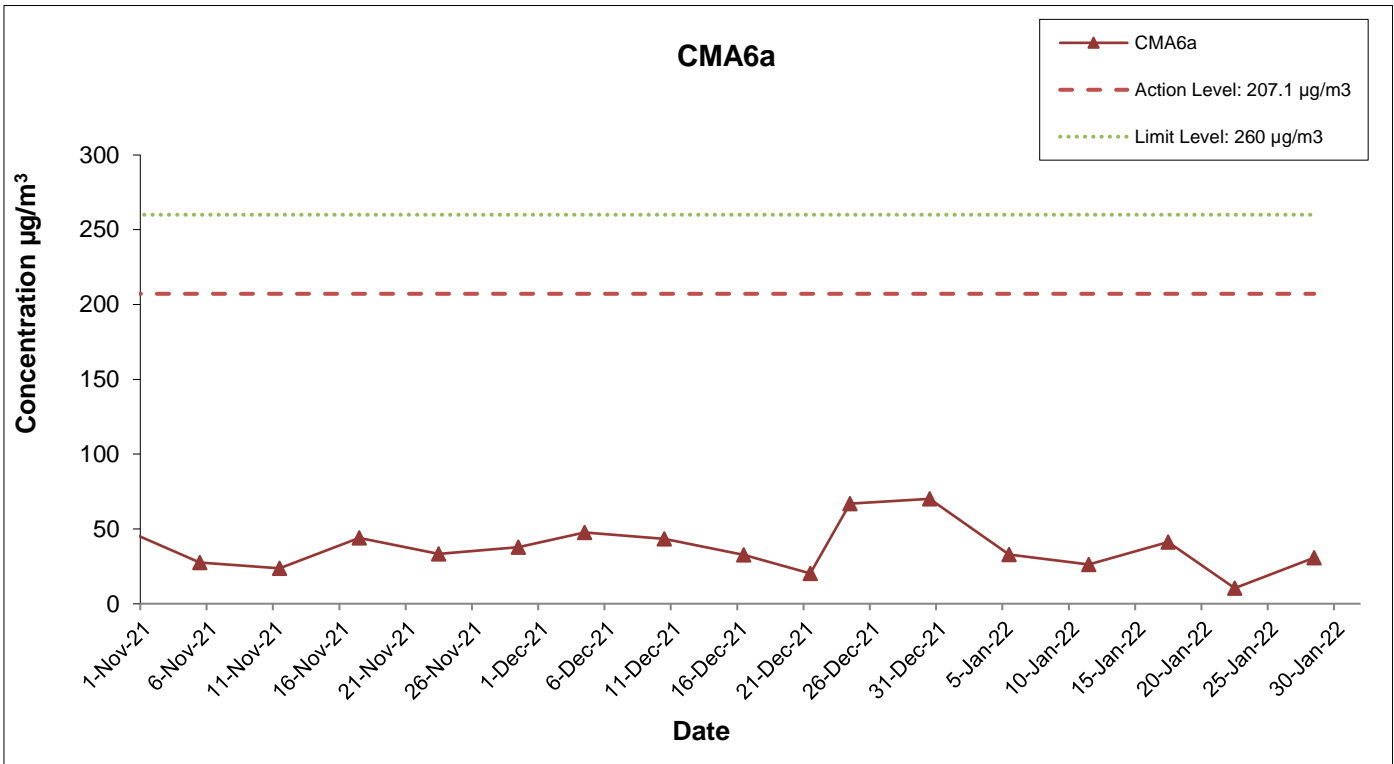
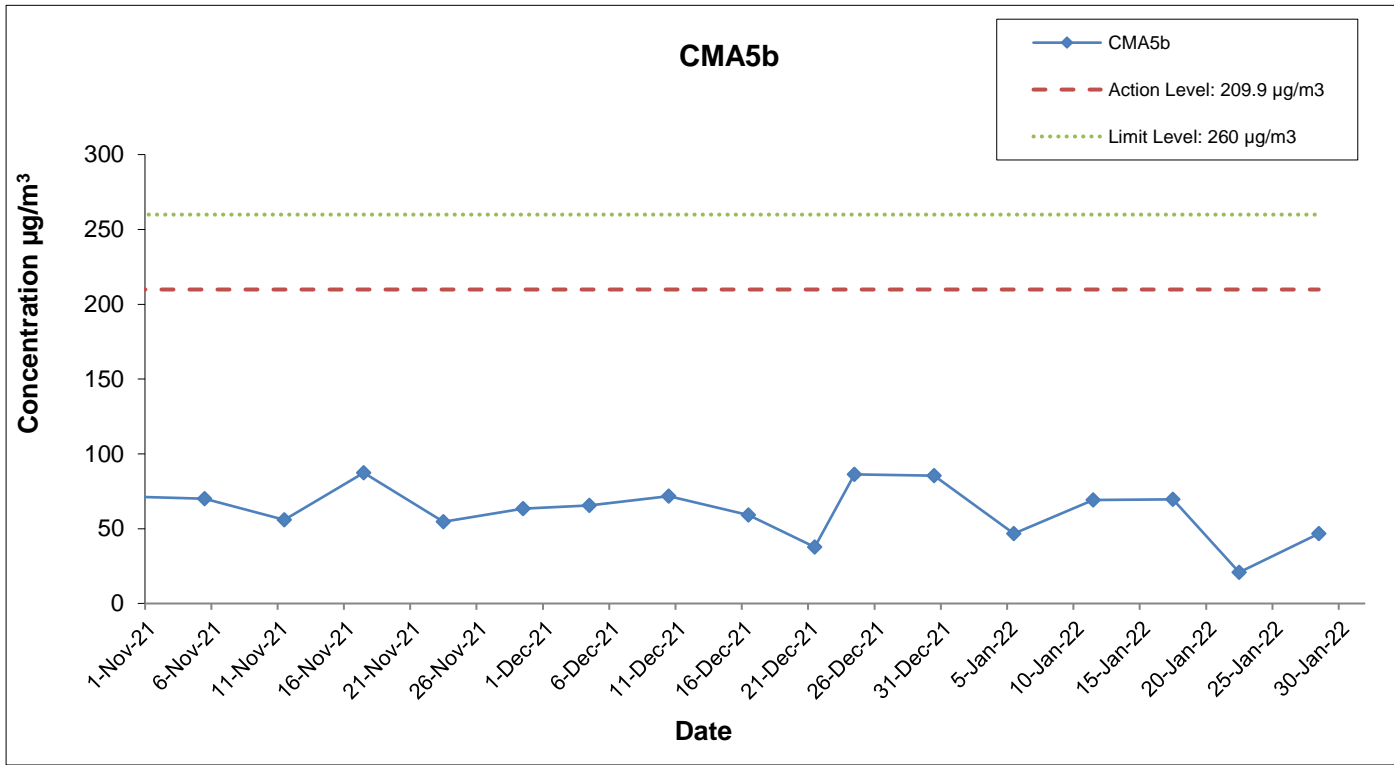
24-hour TSP Monitoring Results at Station CMA5b (Pedestrian Plaza)

Start		End		Weather Condition	Air Temp. (°C)	Atmospheric Pressure (hPa)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Filter Weight (g)		Particulate weight(g)	Elapse Time		Sampling Time(hrs.)	Conc. (µg/m ³)
Date	Time	Date	Time				Initial	Final			Initial	Final		Initial	Final		
05-Nov-21	0:00	06-Nov-21	0:00	Sunny	25.6	1012.5	1.34	1.34	1.34	1928.2	2.6894	2.8244	0.1350	27599.01	27623.01	24.00	70.0
11-Nov-21	0:00	12-Nov-21	0:00	Sunny	21.5	1017.7	1.33	1.33	1.33	1921.0	2.7864	2.8937	0.1073	27623.01	27647.01	24.00	55.9
17-Nov-21	0:00	18-Nov-21	0:00	Sunny	23.5	1017.1	1.33	1.33	1.33	1921.0	2.6501	2.8179	0.1678	27647.01	27671.01	24.00	87.4
23-Nov-21	0:00	24-Nov-21	0:00	Sunny	17.4	1021.1	1.33	1.33	1.33	1921.0	2.7950	2.9000	0.1050	27671.01	27695.01	24.00	54.7
29-Nov-21	0:00	30-Nov-21	0:00	Sunny	21.3	1018.4	1.33	1.33	1.33	1921.0	2.6800	2.8017	0.1217	27695.01	27719.01	24.00	63.4
04-Dec-21	0:00	05-Dec-21	0:00	Sunny	18.1	1022.2	1.33	1.33	1.33	1921.0	2.6800	2.8059	0.1259	27719.01	27743.01	24.00	65.5
10-Dec-21	0:00	11-Dec-21	0:00	Fine	20.9	1020.7	1.33	1.33	1.33	1921.0	2.7920	2.9300	0.1380	27743.01	27767.01	24.00	71.8
16-Dec-21	0:00	17-Dec-21	0:00	Sunny	23.2	1015.8	1.33	1.33	1.33	1921.0	2.6801	2.7938	0.1137	27767.01	27791.01	24.00	59.2
21-Dec-21	0:00	22-Dec-21	0:00	Cloudy	17.3	1013.5	1.33	1.33	1.33	1921.0	2.7924	2.8647	0.0723	27791.01	27815.01	24.00	37.6
24-Dec-21	0:00	25-Dec-21	0:00	Fine	19.9	1017.2	1.33	1.33	1.33	1921.0	2.8135	2.9793	0.1658	27815.01	27839.01	24.00	86.3
30-Dec-21	0:00	31-Dec-21	0:00	Sunny	18.1	1024.6	1.33	1.33	1.33	1921.0	2.8163	2.9805	0.1642	27839.01	27863.01	24.00	85.5
05-Jan-22	0:00	06-Jan-22	0:00	Sunny	20.4	1017.3	1.33	1.33	1.33	1921.0	2.8003	2.8900	0.0897	27863.01	27887.01	24.00	46.7
11-Jan-22	0:00	12-Jan-22	0:00	Sunny	15.8	1020.2	1.33	1.33	1.33	1921.0	2.8376	2.9706	0.1330	27887.01	27911.01	24.00	69.2
17-Jan-22	0:00	18-Jan-22	0:00	Sunny	17.8	1020.7	1.33	1.33	1.33	1921.0	2.8172	2.9511	0.1339	27911.01	27935.01	24.00	69.7
22-Jan-22	0:00	23-Jan-22	0:00	Sunny	17.3	1014.3	1.33	1.33	1.33	1921.0	2.8149	2.8551	0.0402	27935.01	27959.01	24.00	20.9
28-Jan-22	0:00	29-Jan-22	0:00	Fine	18.8	1016.3	1.33	1.33	1.33	1921.0	2.8244	2.9140	0.0896	27959.01	27983.01	24.00	46.6
Average																59.0	
Minimum																13.2	
Maximum																87.4	

Appendix G
Air Quality Monitoring Results

24-hour TSP Monitoring Results at Station CMA6a (WDII PRE site office)

Start		End		Weather Condition	Air Temp. (°C)	Atmospheric Pressure (hPa)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Filter Weight (g)		Particulate weight(g)	Elapse Time		Sampling Time(hrs.)	Conc. (µg/m ³)
Date	Time	Date	Time				Initial	Final			Initial	Final		Initial	Final		
05-Nov-21	0:00	06-Nov-21	0:00	Sunny	25.6	1012.5	1.33	1.33	1.33	1921.0	2.6759	2.7286	0.0527	10344.39	10368.39	24.00	27.4
11-Nov-21	0:00	12-Nov-21	0:00	Sunny	21.5	1017.7	1.33	1.33	1.33	1916.6	2.7953	2.8407	0.0454	10368.39	10392.39	24.00	23.7
17-Nov-21	0:00	18-Nov-21	0:00	Sunny	23.5	1017.1	1.33	1.33	1.33	1916.6	2.6540	2.7381	0.0841	10392.39	10416.39	24.00	43.9
23-Nov-21	0:00	24-Nov-21	0:00	Sunny	17.4	1021.1	1.33	1.33	1.33	1916.6	2.7935	2.8573	0.0638	10416.39	10440.39	24.00	33.3
29-Nov-21	0:00	30-Nov-21	0:00	Sunny	21.3	1018.4	1.33	1.33	1.33	1916.6	2.6676	2.7399	0.0723	10440.39	10464.39	24.00	37.7
04-Dec-21	0:00	05-Dec-21	0:00	Sunny	18.1	1022.2	1.33	1.33	1.33	1916.6	2.6774	2.7686	0.0912	10464.37	10488.37	24.00	47.6
10-Dec-21	0:00	11-Dec-21	0:00	Fine	20.9	1020.7	1.33	1.33	1.33	1916.6	2.8042	2.8873	0.0831	10488.37	10512.37	24.00	43.4
16-Dec-21	0:00	17-Dec-21	0:00	Sunny	23.2	1015.8	1.33	1.33	1.33	1916.6	2.6746	2.7371	0.0625	10512.37	10536.37	24.00	32.6
21-Dec-21	0:00	22-Dec-21	0:00	Cloudy	17.3	1013.5	1.33	1.33	1.33	1916.6	2.7864	2.8252	0.0388	10536.37	10560.37	24.00	20.2
24-Dec-21	0:00	25-Dec-21	0:00	Fine	19.9	1017.2	1.33	1.33	1.33	1916.6	2.7975	2.9257	0.1282	10560.37	10584.37	24.00	66.9
30-Dec-21	0:00	31-Dec-21	0:00	Sunny	18.1	1024.6	1.33	1.33	1.33	1916.6	2.8080	2.9422	0.1342	10584.37	10608.37	24.00	70.0
05-Jan-22	0:00	06-Jan-22	0:00	Sunny	20.4	1017.3	1.33	1.33	1.33	1916.6	2.7939	2.8569	0.0630	10608.37	10632.37	24.00	32.9
11-Jan-22	0:00	12-Jan-22	0:00	Sunny	15.8	1020.2	1.33	1.33	1.33	1916.6	2.8377	2.8880	0.0503	10632.37	10656.37	24.00	26.2
17-Jan-22	0:00	18-Jan-22	0:00	Sunny	17.8	1020.7	1.33	1.33	1.33	1916.6	2.8112	2.8902	0.0790	10656.37	10680.37	24.00	41.2
22-Jan-22	0:00	23-Jan-22	0:00	Sunny	17.3	1014.3	1.33	1.33	1.33	1916.6	2.8199	2.8397	0.0198	10680.37	10704.37	24.00	10.3
28-Jan-22	0:00	29-Jan-22	0:00	Fine	18.8	1016.3	1.33	1.33	1.33	1916.6	2.8164	2.8754	0.0590	10704.37	10728.37	24.00	30.8
																Average	35.2
																Minimum	10.3
																Maximum	70.0



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Shatin Central Link Contract No. 1123
 Entrusted Work for Road P2 & other roads and Slip Road 3



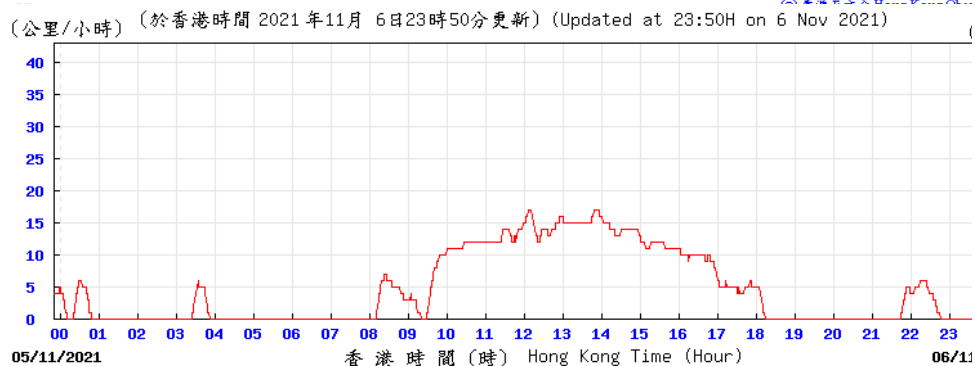
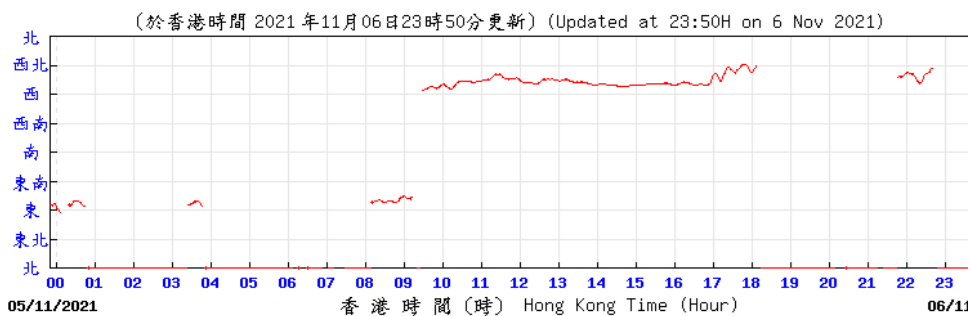
Graphical Presentation of Impact 24-hr TSP Monitoring Results

Date: March 2022

Appendix G

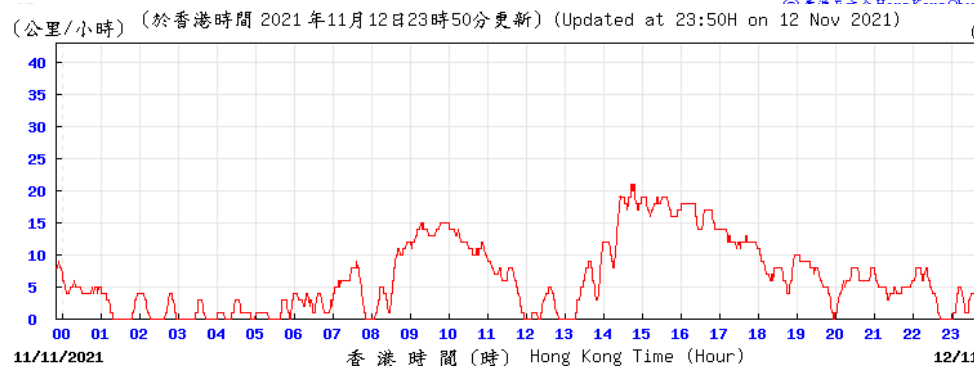
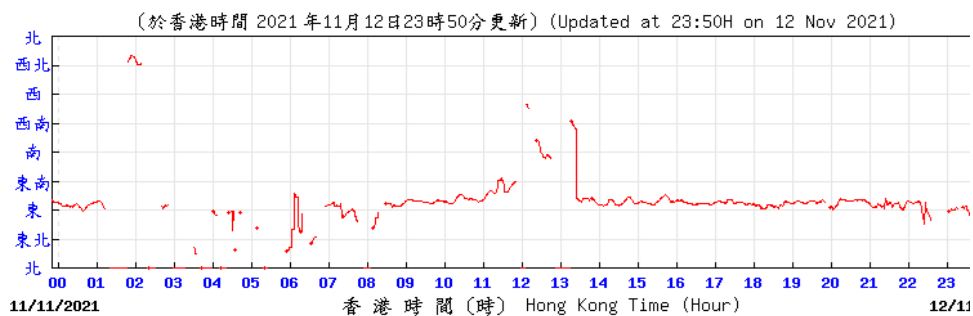
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, November 2021

Wind Direction:



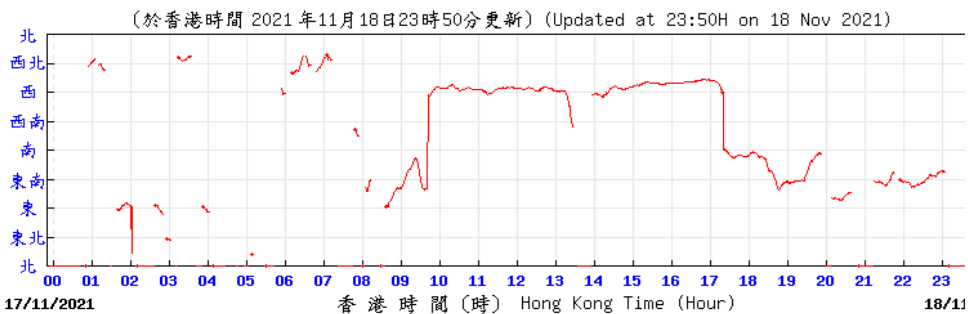
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, November 2021

Wind Direction:

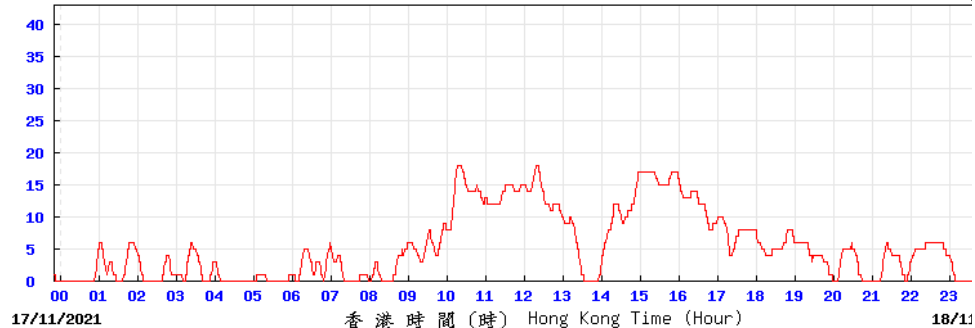


Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, November 2021

Wind Direction:



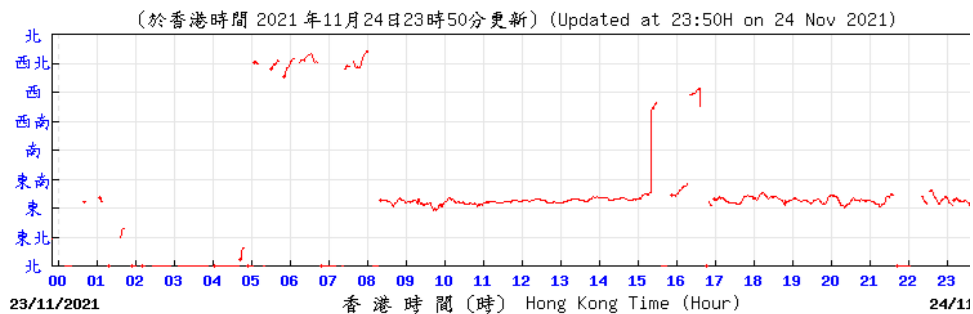
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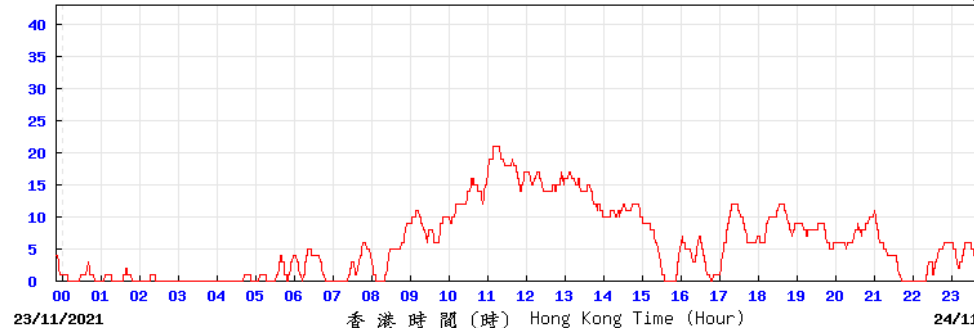
SF © 香港天文台 Hong Kong Obs

Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, November 2021

Wind Direction:



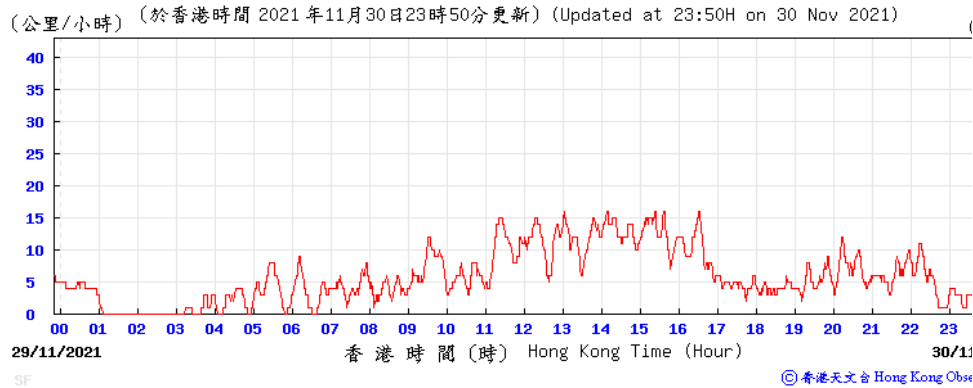
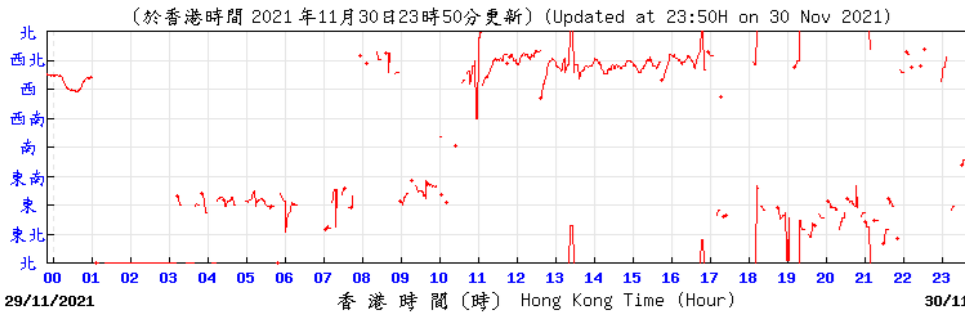
(公里/小時) (於香港時間 2021 年11月24日23時50分更新) (Updated at 23:50H on 24 Nov 2021)



SF © 香港天文台 Hong Kong Obs

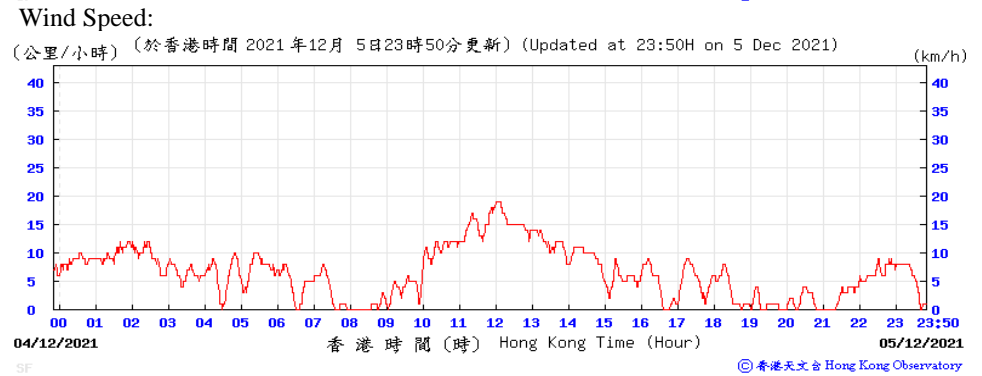
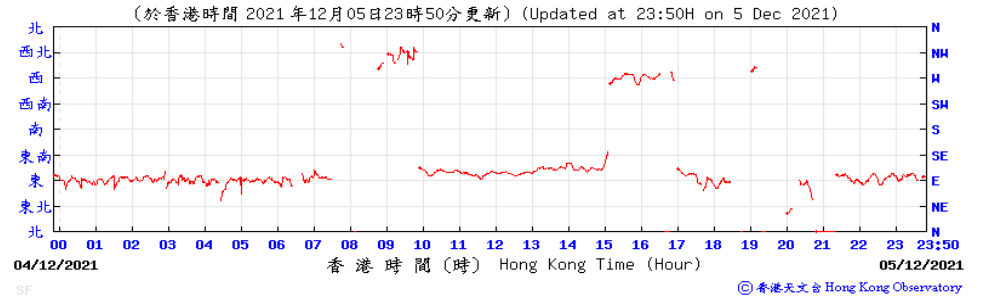
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, November 2021

Wind Direction:



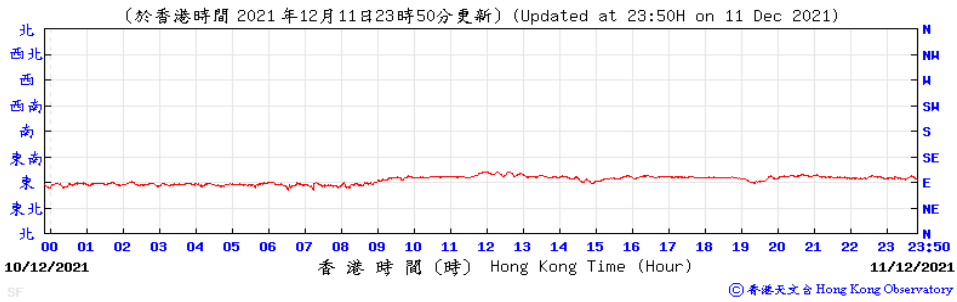
Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, December 2021

Wind Direction:

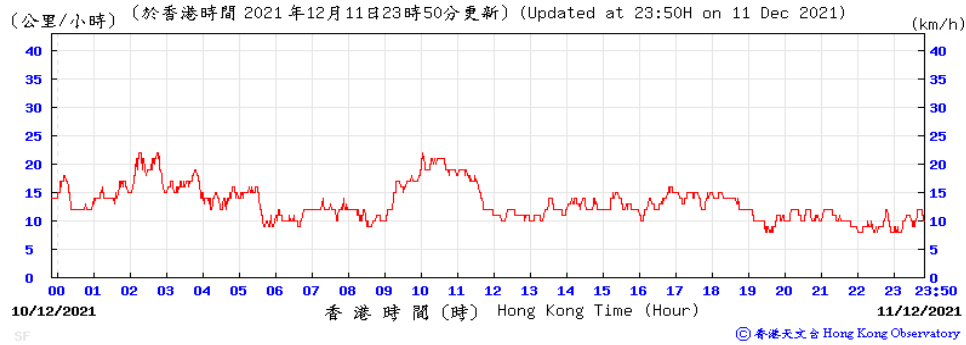


Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, December 2021

Wind Direction:

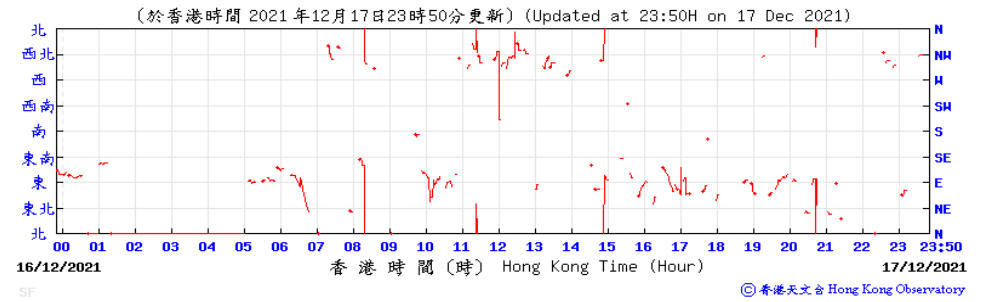


Wind Speed:

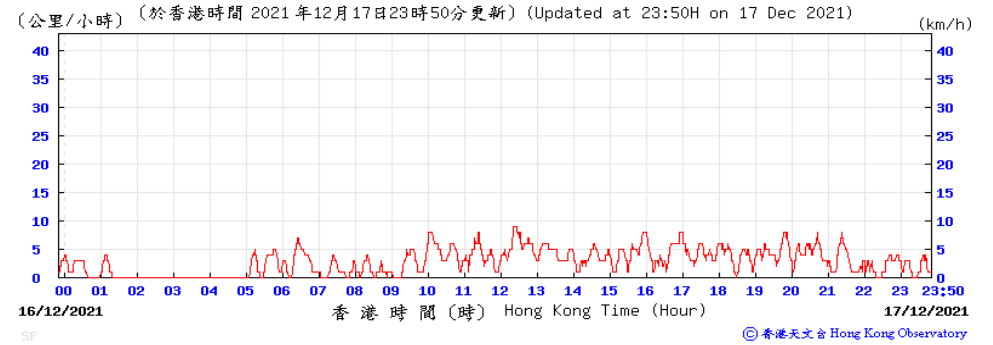


Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, December 2021

Wind Direction:

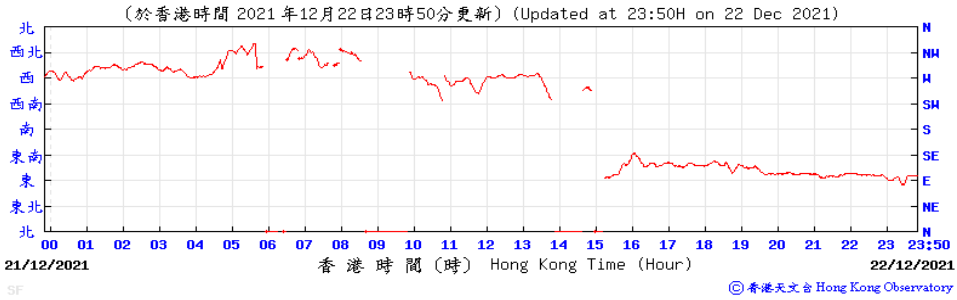


Wind Speed:

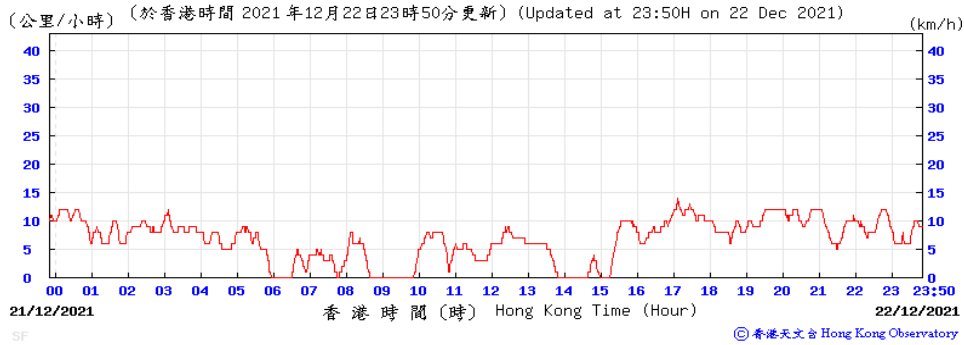


Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, December 2021

Wind Direction:

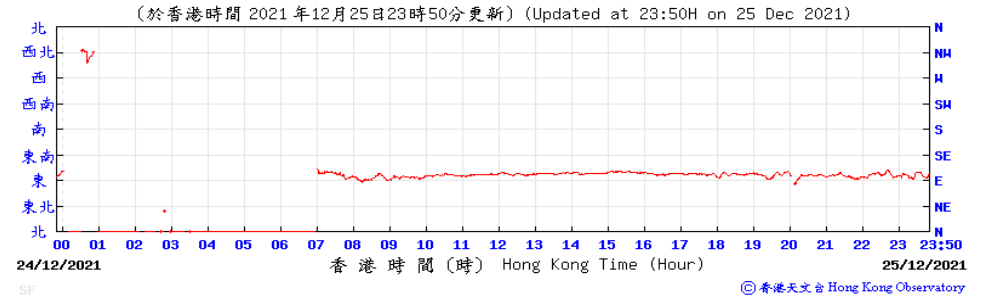


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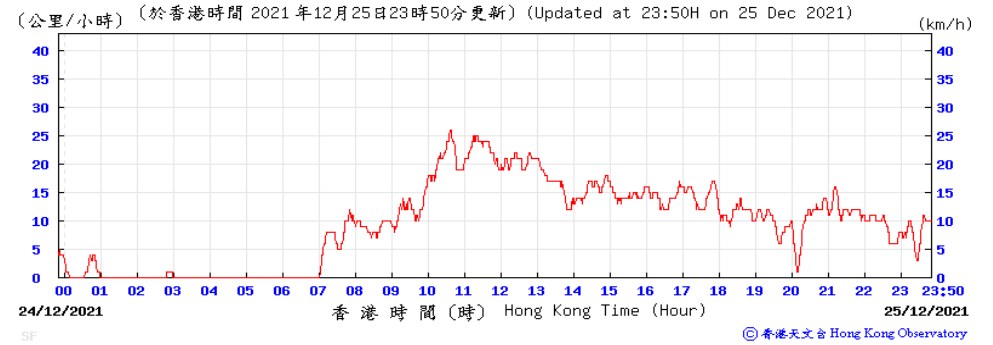


Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, December 2021

Wind Direction:

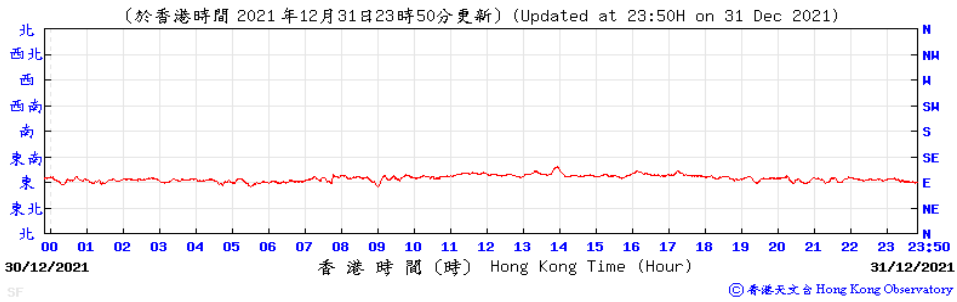


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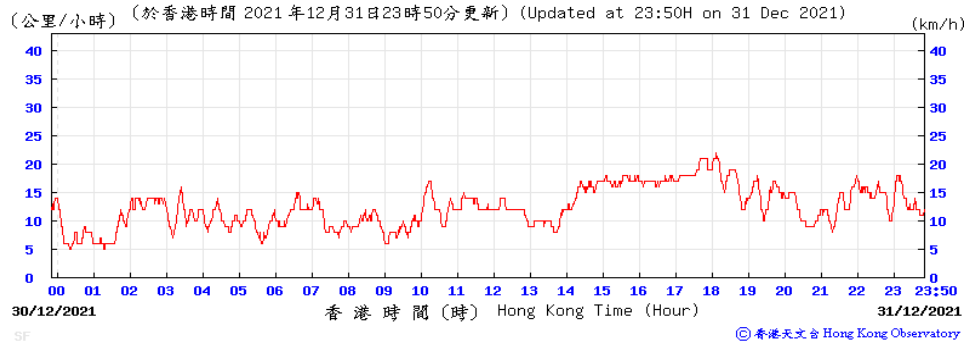


Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, December 2021

Wind Direction:

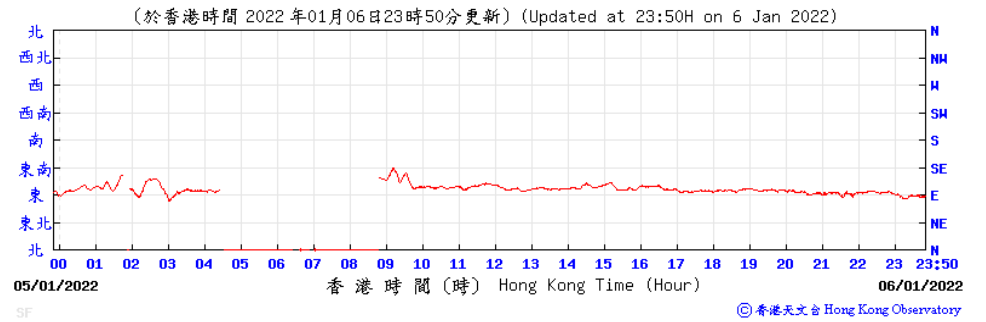


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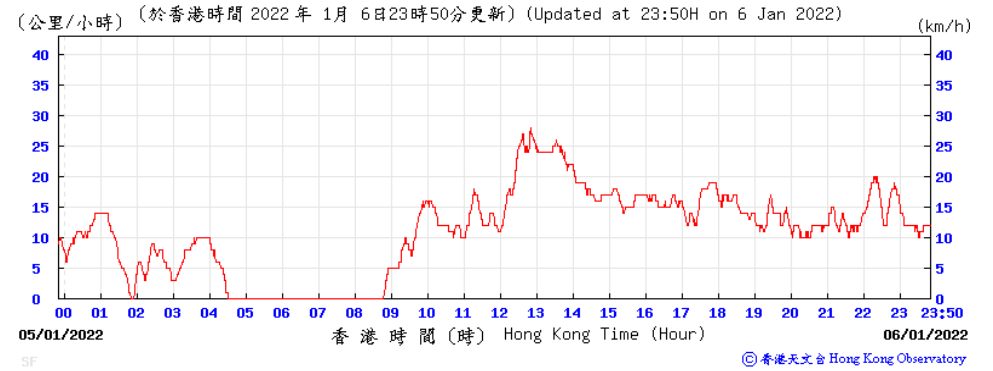


Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, January 2022

Wind Direction:

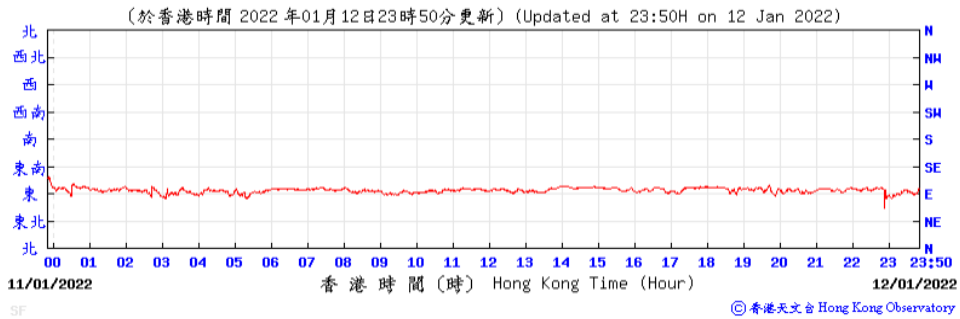


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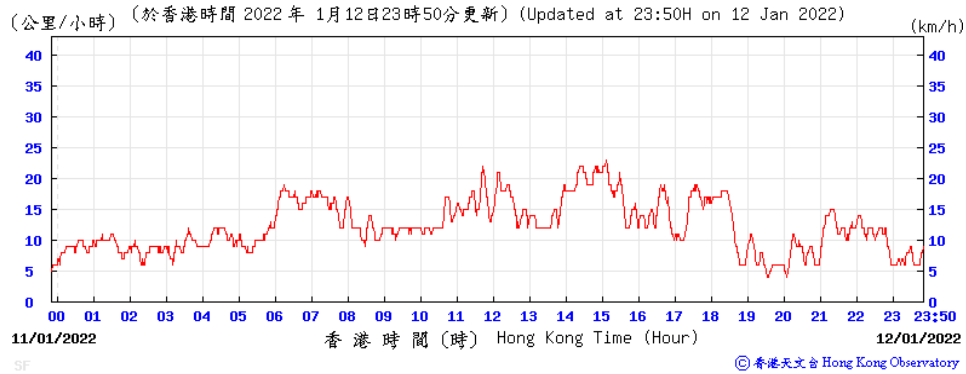


Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, January 2022

Wind Direction:

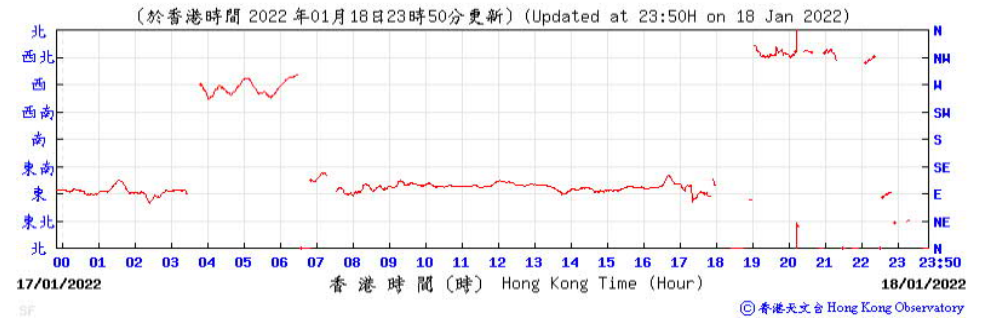


Wind Speed:

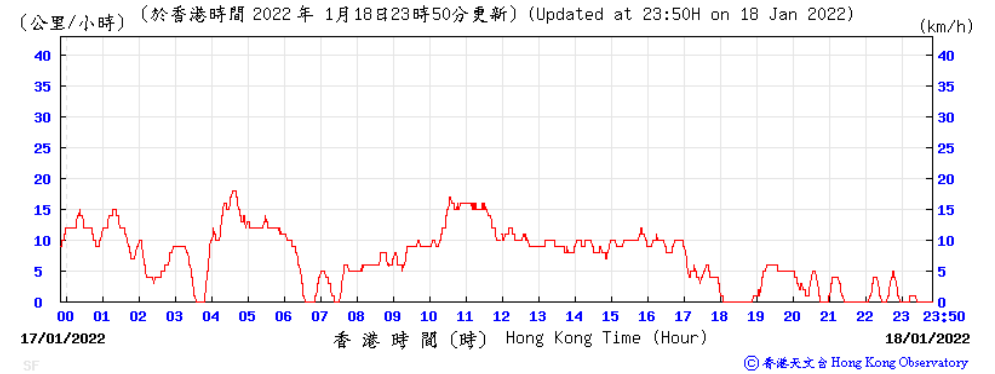


Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, January 2022

Wind Direction:

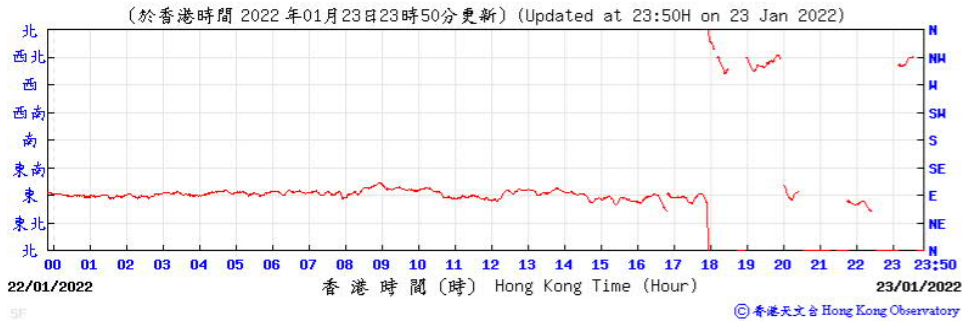


Wind Speed:

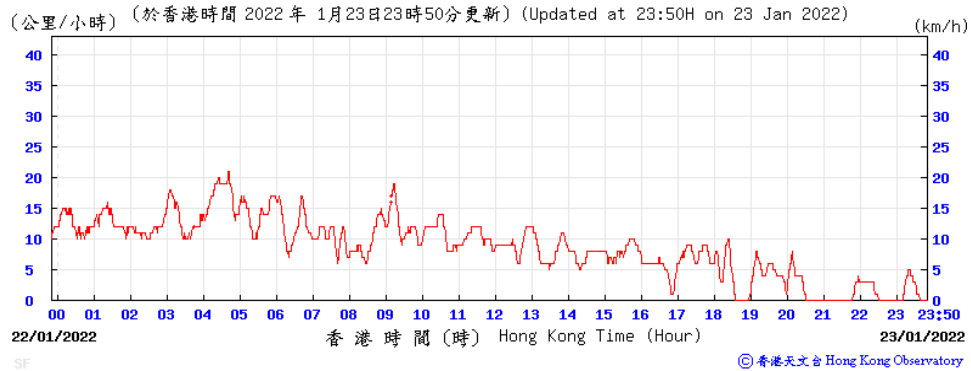


Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, January 2022

Wind Direction:

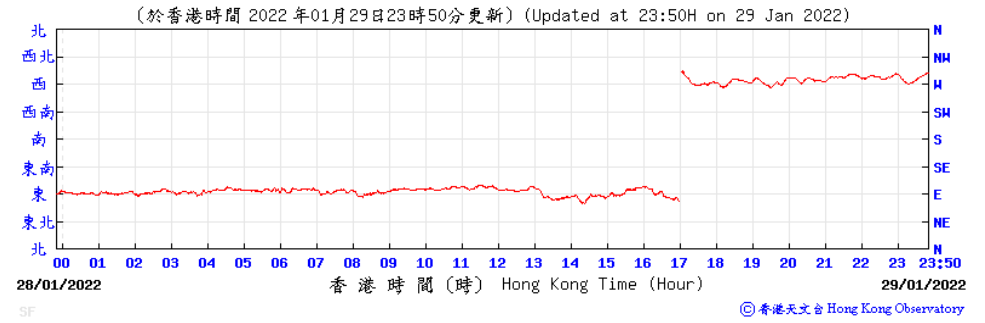


Wind Speed:

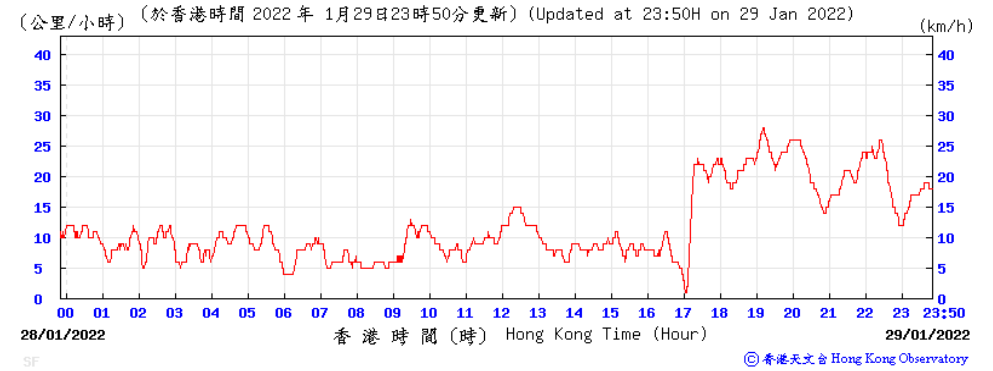


Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, January 2022

Wind Direction:

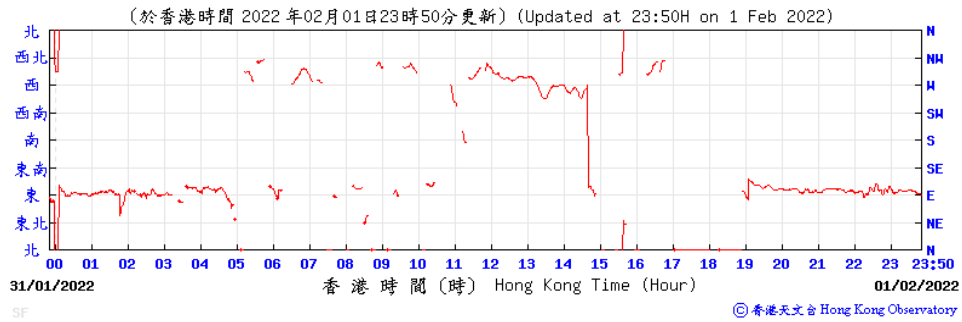


Wind Speed:

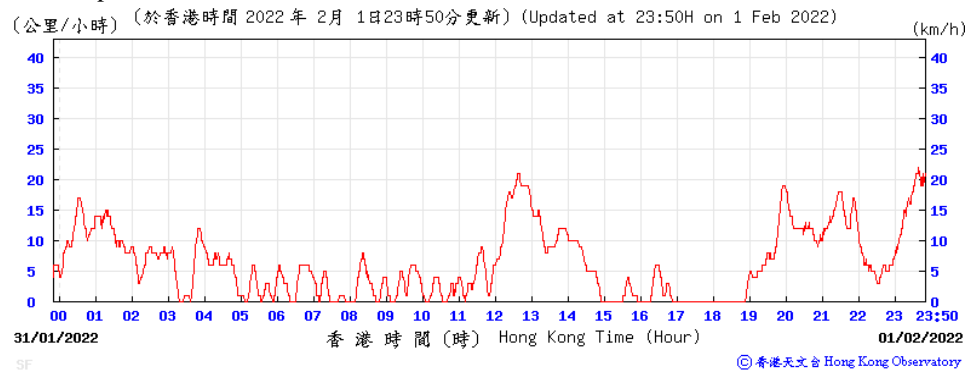


Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, January 2022

Wind Direction:



Wind Speed:



APPENDIX H

**Noise Monitoring Results and
their Graphical Presentations**

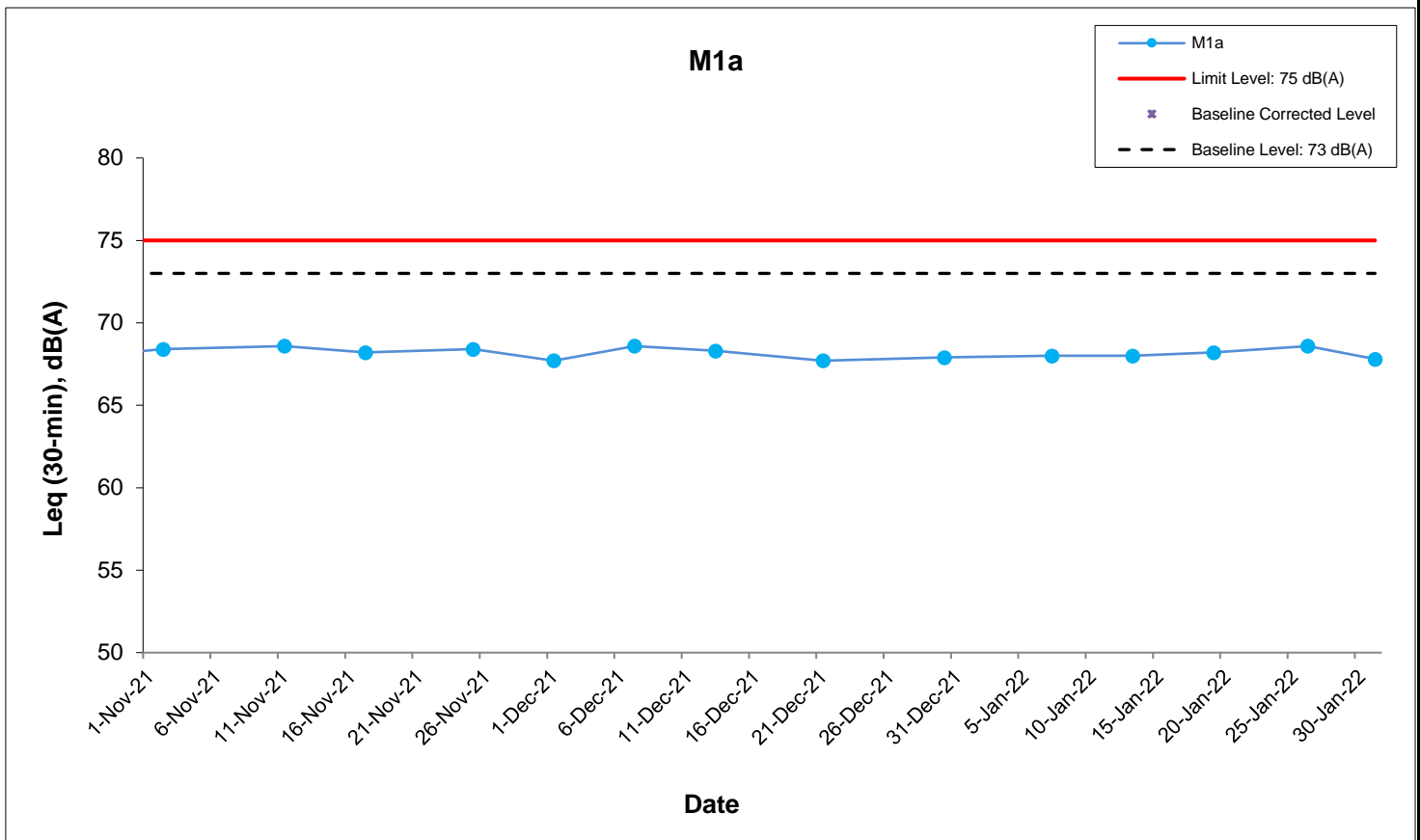
Appendix H Regular Construction Noise Monitoring Results

Daytime Noise Monitoring Results at Station M1a (Footbridge for Ex-Harbour Road Sport Centre)

Date	Weather Condition	Noise Level for 30-min, dB(A) ⁺				Baseline Corrected Level, dB(A)	Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
02-Nov-21	Sunny	11:15	65.0	69.8	68.4	<Baseline	73.0	75	N
11-Nov-21	Sunny	13:05	65.7	69.9	68.6	<Baseline	73.0	75	N
17-Nov-21	Sunny	13:45	65.2	69.1	68.2	<Baseline	73.0	75	N
25-Nov-21	Sunny	13:05	65.8	69.1	68.4	<Baseline	73.0	75	N
01-Dec-21	Sunny	11:15	64.0	68.2	67.7	<Baseline	73.0	75	N
07-Dec-21	Fine	11:20	64.8	70.2	68.6	<Baseline	73.0	75	N
13-Dec-21	Sunny	11:20	66.1	69.6	68.3	<Baseline	73.0	75	N
21-Dec-21	Cloudy	11:25	64.9	69.1	67.7	<Baseline	73.0	75	N
30-Dec-21	Sunny	11:30	64.0	68.6	67.9	<Baseline	73.0	75	N
07-Jan-22	Sunny	13:25	65.3	69.7	68.0	<Baseline	73.0	75	N
13-Jan-22	Sunny	10:40	64.6	69.2	68.0	<Baseline	73.0	75	N
19-Jan-22	Fine	10:50	65.8	69.8	68.2	<Baseline	73.0	75	N
26-Jan-22	Sunny	11:20	66.4	69.7	68.6	<Baseline	73.0	75	N
31-Jan-22	Fine	13:20	64.2	69.3	67.8	<Baseline	73.0	75	N

⁺ - Façade measurement

Appendix H Regular Construction Noise Monitoring Results



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Shatin Central Link Contract No. 1123
 Entrusted Work for Road P2 & other roads and Slip Road 3

Graphical Presentation of Impact Noise Monitoring Results (Nov 2021 to Jan 2022)

Date: March 2022

APPENDIX I

Event Action Plan

Appendix I Event Action Plan

Event / Action Plan for Construction Dust Monitoring

EVENT	ACTION			
	ET	IEC	ER	Contractor
ACTION LEVEL				
Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor’s working method. 	<ol style="list-style-type: none"> 1. Notify Contractor. 	<ol style="list-style-type: none"> 1. Identify source(s), investigate the causes of exceedance and propose remedial measures; 2. Implement remedial measures; 3. Amend working methods agreed with the ER as appropriate.
Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Checking monitoring data submitted by ET; 2. Check Contractor’s working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Appendix I Event Action Plan

EVENT	ACTION			
	ET	IEC	ER	Contractor
LIMIT LEVEL				
Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor’s remedial actions and keep IEC, EPD and ER informed of the results. 	<ol style="list-style-type: none"> 1. Checking monitoring data submitted by ET; 2. Check Contractor’s working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor’s working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor’s remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor’s remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Appendix I Event Action Plan

Event and Action Plan for Construction Noise Monitoring

EVENT	ACTION			
	ET	IEC	ER	Contractor
Exceedance of Action Level	<ol style="list-style-type: none"> 1. Notify ER, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness. <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>	<ol style="list-style-type: none"> 1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Advise the ER on the effectiveness of the proposed remedial measures. <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures. <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC and ER; 2. Implement noise mitigation proposals. <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>
Exceedance of Limit Level	<ol style="list-style-type: none"> 1. Inform IEC, ER, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and ER on remedial measures required; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly. <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the 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>(The above actions should be taken within 2 working days after the exceedance is identified)</p>	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; 5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated. <p>(The above actions should be taken within 2 working days after the exceedance is identified)</p>

APPENDIX J

**Cumulative Statistics of Exceedances, Complaints,
Notification of Summons and Successful Prosecutions**

Appendix H**Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions**

	Date Received	Subject	Status	Total no. received in this month	Total no. received since project commencement
Environmental complaints	-	-	-	0	0
Notification of summons	-	-	-	0	0
Successful Prosecutions	-	-	-	0	0

APPENDIX K

Waste Flow Table

MONTHLY SUMMARY WASTE FLOW TABLE

Contract No.: SCL 1123 - CEDD Entrusted Work for Road P2 & other roads and Slip Road 3
 Reporting Month: November 2021 to January 2022

Monthly Summary Waste Flow Table for 2021

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly					Actual Quantities of Marine Dumping 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	Type 1	Type 2
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)	(in '000m ³)	(in '000m ³)
Jan	0.958	0.000	0.000	0.000	0.958	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Feb	0.598	0.000	0.000	0.000	0.598	0.051	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mar	0.700	0.000	0.000	0.000	0.700	0.097	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Apr	0.741	0.000	0.000	0.000	0.741	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
May	0.176	0.000	0.000	0.000	0.176	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Jun	0.070	0.000	0.000	0.000	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
July	0.315	0.000	0.000	0.000	0.315	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
August	0.525	0.000	0.000	0.000	0.525	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
September	0.112	0.000	0.000	0.000	0.112	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000
October	0.272	0.000	0.000	0.000	0.272	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
November	0.196	0.000	0.000	0.000	0.196	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
December	0.969	0.000	0.000	0.000	0.969	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	5.632	0.000	0.000	0.000	3.558	0.148	0.000	0.000	0.000	0.000	0.001	0.000	0.000
Total (Reporting Months)	Refer to Summary Waste Flow Table 2022												

