

Leighton-China States Joint Venture

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


Monthly EM&A Report No. 5

for

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

[Period from 1 to 31 May 2021]

(June 2021)

Verified by:  Claudine LEE

Position: Independent Environmental Checker

Date: 10 June 2021

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Verified by: _____ FUNG Yiu Wah 

Position: _____ Environmental Team Leader

Date: _____ 10 June 2021

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****Monthly EM&A Report for
May 2021**

[June 2021]

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Version: 0

Date: 9 June 2021

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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 and 31 May 2021. As informed by the Contractor, major activities in the reporting period were:

Location	Site Activities
Road P2 – West (Slip Road 3)	<ul style="list-style-type: none">• Drainage works
Road P2 – East (Hung Hing Road)	<ul style="list-style-type: none">• WSD water main replacement• Drainage works
Road P2 – Permanent PTI (Public Transport Interchange)	<ul style="list-style-type: none">• Drainage works

Breaches of Action and Limit Levels for Air Quality

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

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 month.

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

Complaint, Notification of Summons and Successful Prosecution

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

Reporting Changes

There was no reporting change in the reporting month.

Future Key Issues

Key issues to be considered in the next three months included:

Location	Site Activities
Road P2 – West (Slip Road 3)	<ul style="list-style-type: none">• Drainage works• Underground Utilities• Retain wall construction
Road P2 – East (Hung Hing Road)	<ul style="list-style-type: none">• Drainage works• Underground Utilities• Road works
Road P2 – PTI (Public Transport Interchange)	<ul style="list-style-type: none">• Drainage & UU works• Road works

Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, construction noise, water quality and waste management.

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 fifth monthly EM&A Report which summaries the impact monitoring results and audit findings for the Project during the reporting period between 1 and 31 May 2021.

1.2 Report Structure

- 1.2.1 This monthly EM&A 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 month are summarised below:

Location	Site Activities
Road P2 – West (Slip Road 3)	<ul style="list-style-type: none">• Drainage works
Road P2 – East (Hung Hing Road)	<ul style="list-style-type: none">• WSD water main replacement• Drainage works
Road P2 – Permanent PTI (Public Transport Interchange)	<ul style="list-style-type: none">• Drainage works

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)	Senior Construction Manager – SCL Civil	Mr. Mike Bezzano	3959 2128	3959 2200
		SCL Project Environmental Team Leader	Ms. Lisa Poon	3127 6295	3127 6422
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	Ms. Doris Law ¹	3973 1498	
			Mr. Andy Leung ¹		
AECOM	Contractor's Environmental Team (ET)	ET Leader	Mr. Y W Fung	3922 9366	2317 7609

Remark:

1. The Environmental Engineer, Ms. Doris Law, was replaced to Mr. Alex Leung on 21 May 2021.

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 month 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:

- The Contractor was reminded to keep tracking on the site conditions 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: 0988))
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 Month

3.1.8 The schedule for environmental monitoring in May 2021 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 2250 (S/N: 3001291) Model No. B&K 2238 (S/N: 2800927)
Acoustic Calibrator	Model No. CAL21 (S/N: 34113610(2011)) Model No. NC-74 (S/N: 34246490)

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 Month

- 3.2.6 The schedule for environmental monitoring in May 2021 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 3.3 (FEP-13//364/2009/H & FEP-03/376/2009)	Monthly EM&A Report for April 2021	12 May 2021

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	42.0	27.8 – 65.4	209.9	260
CMA6a	24.0	15.8 – 43.7	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	63.0	52.7 – 68.8	339.7	500
CMA6a	59.8	50.0 – 64.5	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 month.

5.1.3 No Action and Limit Level exceedance were recorded for 24-hour TSP monitoring at the monitoring locations in the reporting month.

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 month.

5.2.3 No Limit Level exceedance of noise was recorded at the monitoring station in the reporting month.

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, 176 m³ of inert C&D material was generated and disposed of as public fill in the reporting month. No inert C&D materials were reused in other projects or in the Contract in the reporting month. No fill material was imported in the reporting month. No general refuse was generated in the reporting month. No metal, paper/cardboard packaging material, plastic were collected by recycling contractor in the reporting month. 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**. The observations and recommendations made during the site inspections are presented in **Table 6.1**.

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 month, 4 site inspection was carried out on 6, 13, 21 and 27 May 2021. Joint inspections with the IEC, ER, the Contractor and the ET were conducted on 21 May 2021. No non-compliance was recorded during the site inspection. Details of observations recorded during the site inspections are presented in **Table 6.1**.

Table 6.1 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	21 May 2021	<ul style="list-style-type: none"> Exposed area was observed to be dry at Road P2 – Convention Avenue. The Contractor was advised to provide water spraying on the exposed area for dust suppression. 	This item was rectified on 25 May 2021.
Noise	Nil	Nil	Nil
Water Quality	21 May 2021	<ul style="list-style-type: none"> Inadequate measure for muddy water seepage prevention was observation at Road P2 – Convention Avenue. The Contractor was advised to provide adequate measure along the site boundary to prevent muddy water seepage. 	This item was rectified on 26 May 2021.
	27 May 2021	<ul style="list-style-type: none"> Residual silt was observed on the ground at Road P2 – Convention Avenue. The Contractor was advised to remove it to prevent muddy water seepage. 	This item was rectified on 31 May 2021.
Waste/ Chemical Management	6 May 2021	<ul style="list-style-type: none"> Accumulated waste was observed at Road P2 – Convention Avenue. The Contractor was advised to remove the waste regularly to maintain the site tidiness. 	This item was rectified on 14 May 2021.
Landscape & Visual	Nil	Nil	Nil
Permits/ Licenses	Nil	Nil	Nil

- 6.1.3 No follow up action was requested by Contractor's ET during the site inspection on 13 May 2021.
- 6.1.4 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 month.
- 7.1.2 All 1-hour TSP result was below the Action and Limit level at all monitoring locations in the reporting month
- 7.1.3 No Action Level exceedance was recorded since no noise related complaint was received in the reporting month.
- 7.1.4 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

7.2 Summary of Environmental Non-Compliance

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

7.3 Summary of Environmental Complaints

- 7.3.1 No environmental related complaint was received in the reporting month. 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 month. Cumulative statistics on notification of summons and successful prosecutions is provided in **Appendix J**.

8 FUTURE KEY ISSUES

8.1 Construction Programme for the Next Three Month

8.1.1 The major construction works between June and August 2021 will be:

Location	Site Activities
Road P2 – West (Slip Road 3)	<ul style="list-style-type: none"> • Drainage works • Underground Utilities • Retain wall construction
Road P2 – East (Hung Hing Road)	<ul style="list-style-type: none"> • Drainage works • Underground Utilities • Road works
Road P2 – PTI (Public Transport Interchange)	<ul style="list-style-type: none"> • Drainage & UU works • Road works

8.2 Key Issues for the Coming Month

8.2.1 Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, construction noise, water quality and waste management.

8.3 Monitoring Schedule for the Next Three Month

8.3.1 The tentative schedules for environmental monitoring in between June and August 2021 are provided in **Appendix F**.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

- 9.1.1 24-hour TSP, 1-hour TSP and noise monitoring were carried out in the reporting month.
- 9.1.2 No Action and Limit Level exceedance was recorded for 24-hour TSP monitoring at the monitoring locations in the reporting month.
- 9.1.3 No Action and Limit Level exceedance was recorded for 1-hour TSP monitoring at the monitoring locations in the reporting month.
- 9.1.4 No Action Level exceedance was recorded since no noise related complaint was received in the reporting month.
- 9.1.5 No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.
- 9.1.6 4 nos. of environmental site inspections were carried out in May 2021. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit.
- 9.1.7 No environmental complaint was received in the reporting month.
- 9.1.8 No notification of summons and successful prosecution were received in the reporting month.
- 9.1.9 Referring to the Contractor's information, no notification of summons and successful prosecution was received in the reporting month.

9.2 Recommendations

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

Air Quality Impact

- The Contractor was advised to provide water spraying on the exposed area for dust suppression.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- The Contractor was advised to provide adequate measure along the site boundary to prevent muddy water seepage.

Chemical and Waste Management

- The Contractor was advised to remove the waste regularly to maintain the site tidiness.

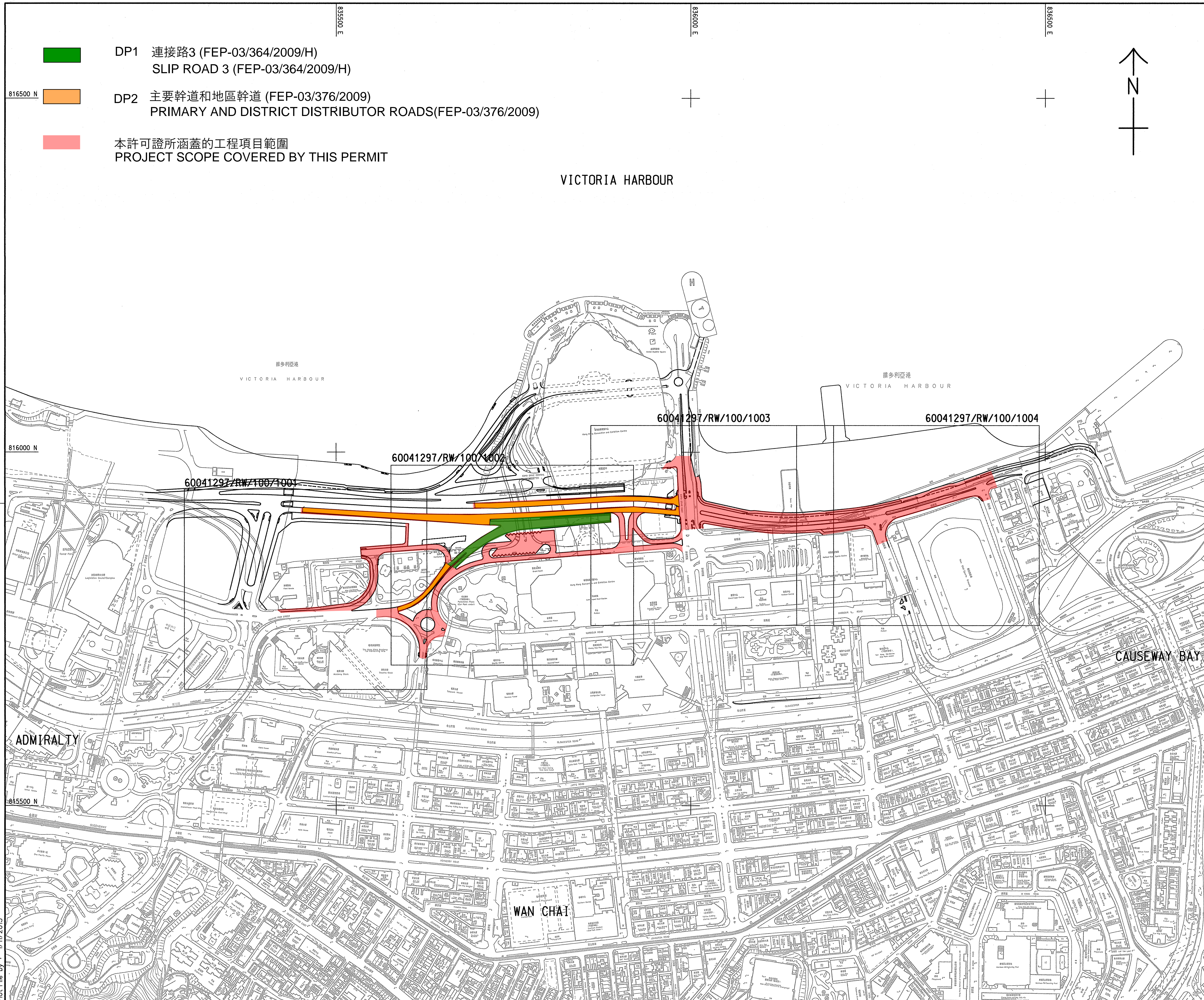
Landscape & Visual Impact

- No specific observation was identified in the reporting month.

Permits/licenses

- No specific observation was identified in the reporting month.

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

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

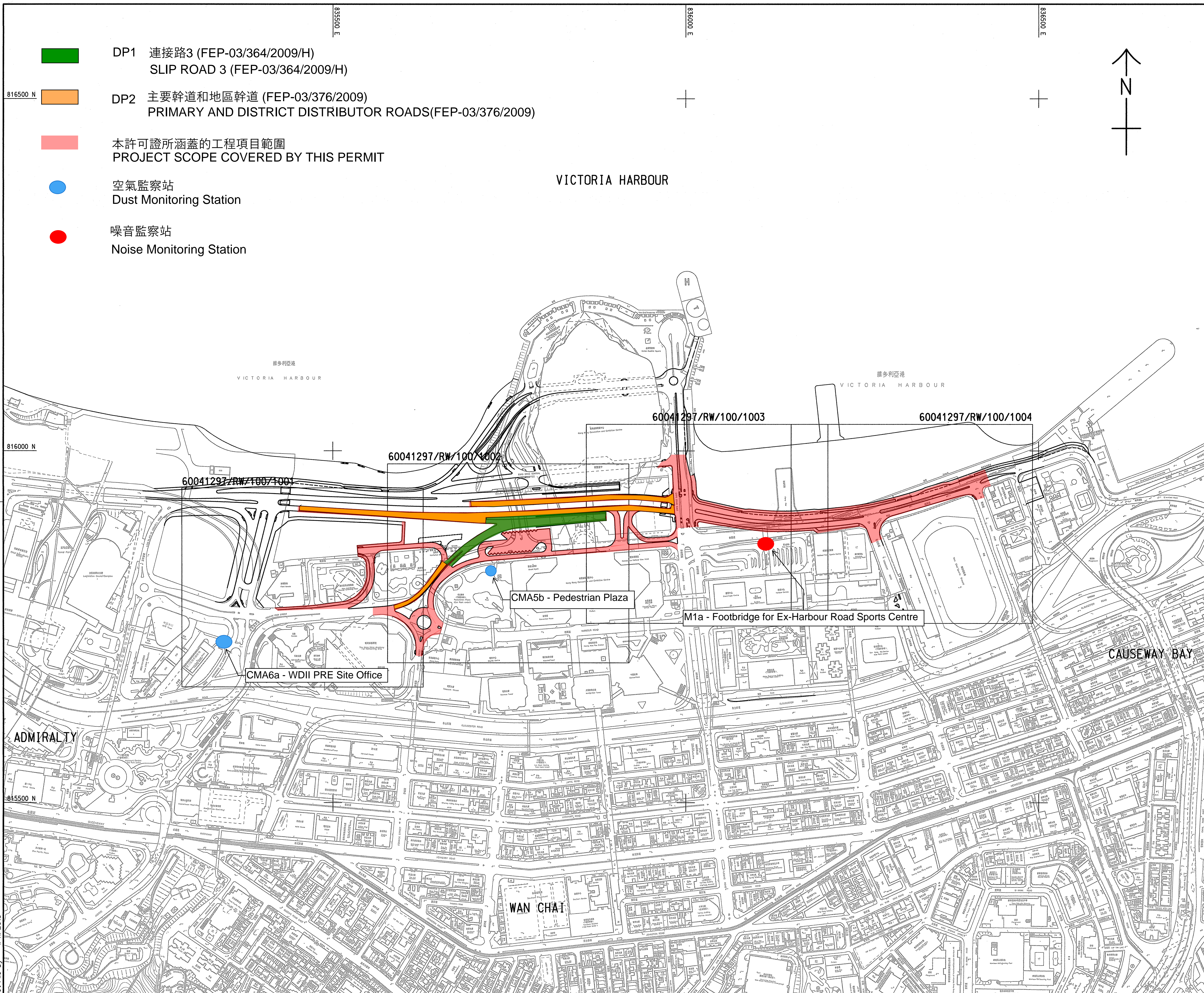
AECOM

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 大牛單位	
A1 1:2500	METRES	
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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	SLYY	OCT 13
REV. NO.	DESCRIPTION	DATE	DATE

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	DATE 日期
DRAWN BY 繪圖	STATUS 狀態	TKH	
SCALE 比例	A1 1:2500		
DIMENSIONS ARE IN METRES			
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Plot File by : 1/11/2013

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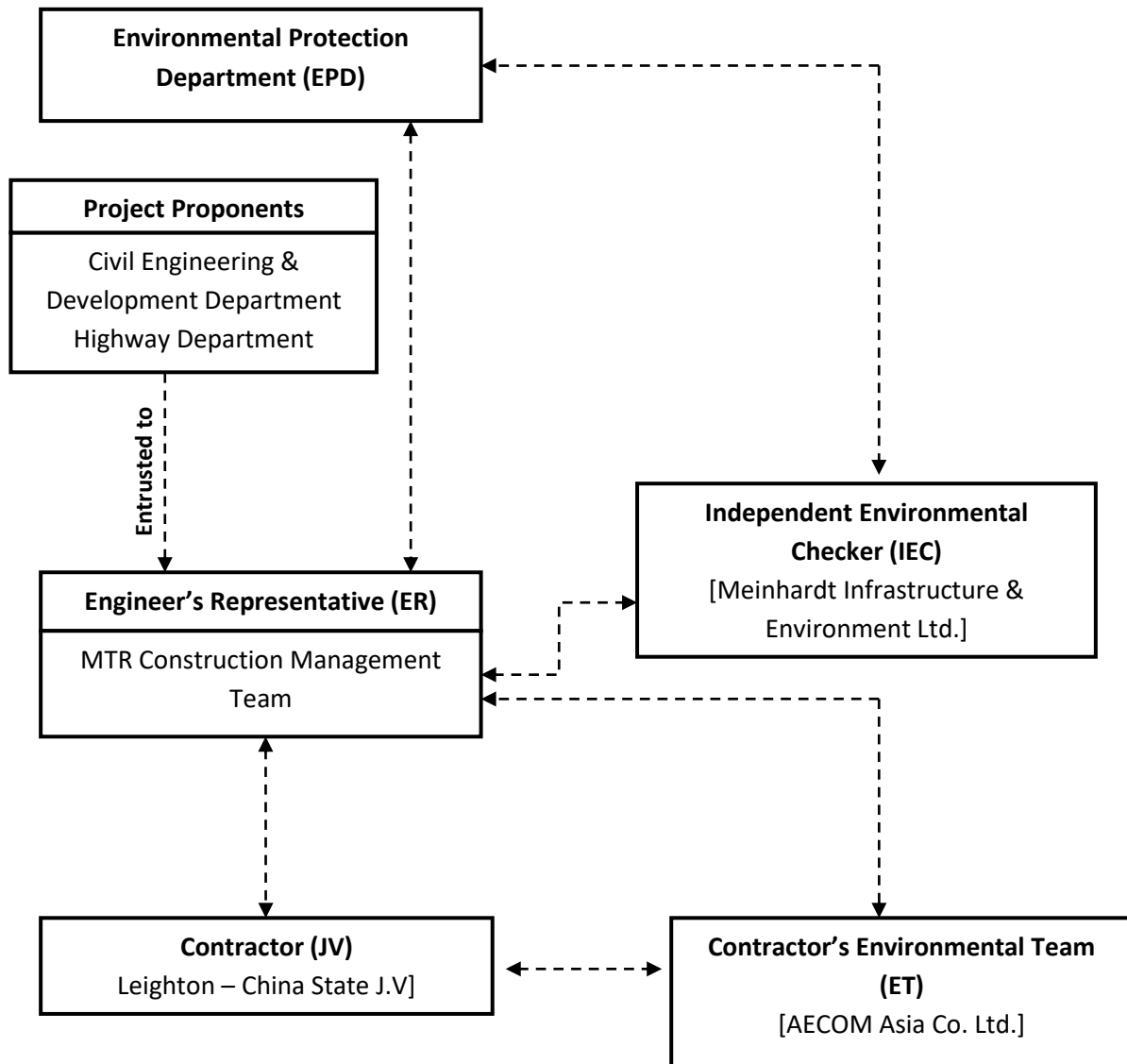
APPENDIX A

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	@
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 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 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

Leighton – China State J.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
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

Certificate of Calibration

Calibration Certification Information			
Cal. Date: June 5, 2020	Rootsmer S/N: 438320	Ta: 295 °K	
Operator: Jim Tisch		Pa: 748.0 mm Hg	
Calibration Model #: TE-5025A	Calibrator S/N: 0988		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3610	3.2	2.00
2	3	4	1	0.9700	6.4	4.00
3	5	6	1	0.8630	7.9	5.00
4	7	8	1	0.8240	8.8	5.50
5	9	10	1	0.6800	12.9	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left(Ta/Pa \right)}$ (y-axis)
0.9900	0.7274	1.4101	0.9957	0.7316	0.8881
0.9858	1.0162	1.9943	0.9914	1.0221	1.2560
0.9838	1.1399	2.2296	0.9894	1.1465	1.4042
0.9826	1.1924	2.3385	0.9882	1.1993	1.4728
0.9771	1.4369	2.8203	0.9828	1.4452	1.7762
QSTD	m=	1.98556	QA	m=	1.24332
	b=	-0.03069		b=	-0.01933
	r=	0.99996		r=	0.99996

Calculations			
Vstd=	$\Delta Vol \left((Pa - \Delta P) / Pstd \right) \left(Tstd / Ta \right)$	Va=	$\Delta Vol \left((Pa - \Delta P) / Pa \right)$
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=	$1/m \left(\left(\sqrt{\Delta H \left(Ta / Pa \right)} \right) - b \right)$

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

AECOM Asia Company Limited

TSP High Volume Sampler

Field Calibration Report

Station: WDII PRE Site Office Operator: Shum Kam Yuen
 Cal. Date: 19 Mar 2021 Next Due Date: 19 May 2021
 Equipment No.: A-001-79T Serial No.: 3384

Ambient Condition			
Temperature, Ta (K)	293.0	Pressure, Pa (mmHg)	760.5

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	1.98556	Intercept, bc	-0.03069
Last Calibration Date:	5 Jun 2020	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	5 Jun 2021	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	[DH x (Pa/760) x (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	1.37	45.0	45.40
13	6.0	2.47	1.26	40.0	40.35
10	4.6	2.16	1.11	32.0	32.28
7	3.2	1.80	0.92	24.0	24.21
5	2.5	1.60	0.82	18.0	18.16

By Linear Regression of Y on X

Slope, mw = 49.0826 Intercept, bw = -21.6902

Correlation Coefficient* = 0.9989

*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} = 41.75

Remarks: _____

QC Reviewer: WS CHAN Signature: [Signature] Date: 19/03/21

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station: WDII PRE Site Office Operator: Shum Kam Yuen
 Cal. Date: 18 May 2021 Next Due Date: 18 Jul 2021
 Equipment No.: A-001-79T Serial No.: 3384

Ambient Condition			
Temperature, Ta (K)	303.0	Pressure, Pa (mmHg)	759.5

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	1.98556	Intercept, bc	-0.03069
Last Calibration Date:	5 Jun 2020	$mc \times Qstd + bc = [DH \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	5 Jun 2021	$Qstd = \{[DH \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Resistance Plate No.	Orifice			HVS Flow Recorder	
	DH (orifice), in. of water	[DH x (Pa/760) x (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	1.34	46.0	45.60
13	6.0	2.43	1.24	40.0	39.66
10	4.5	2.10	1.07	32.0	31.72
7	3.2	1.77	0.91	24.0	23.79
5	2.4	1.54	0.79	18.0	17.84

By Linear Regression of Y on X

Slope, mw = 49.9677 Intercept, bw = -21.7130
 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} = 43.62

Remarks: _____

QC Reviewer: WS CHAN Signature: [Signature] Date: 18/05/21

AECOM Asia Company Limited
TSP High Volume Sampler
Field Calibration Report

Station Pedestrian Plaza Operator: Choi Wing Ho
 Cal. Date: 19-Apr-21 Next Due Date: 19-Jun-21
 Equipment No.: A-001-70T Serial No. 10273

Ambient Condition			
Temperature, Ta (K)	298	Pressure, Pa (mmHg)	758.7

Orifice Transfer Standard Information					
Serial No:	988	Slope, mc	1.98556	Intercept, bc	-0.03069
Last Calibration Date:	05-Jun-20	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	05-Jun-21				

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	6.7	2.59	1.32	43.0	42.96
13	5.6	2.36	1.21	38.0	37.97
10	4.7	2.17	1.11	33.0	32.97
7	3.5	1.87	0.96	27.0	26.98
5	2.6	1.61	0.83	21.0	20.98

By Linear Regression of Y on X

Slope, mw = 44.5351 Intercept, bw = -15.8532

Correlation Coefficient* = 0.9991

*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 = $(mw \times Qstd + bw) \times [(760 / Pa) \times (Ta / 298)]^{1/2} =$ 42.08

Remarks: _____

QC Reviewer: LS CHAN Signature: [Signature] Date: 19/04/21

EQUIPMENT CALIBRATION RECORD

Type: Laser Dust Monitor
 Manufacturer/Brand: SIBATA
 Model No.: LD-3
 Equipment No.: A.005.09a
 Sensitivity Adjustment Scale Setting: 797 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): 797 CPM
 Sensitivity Adjustment Scale Setting (After Calibration): 797 CPM

Hour	Date (dd/mm/yy)	Time	Ambient Condition		Concentration ^① (mg/m ³) 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	1980	33.00
2	30/04/21	10:30-11:30	28.0	78	0.05045	2030	33.83
3	30/04/21	11:30-12:30	28.0	78	0.05250	2120	35.33
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: 0.9997

Validity of Calibration Record: 30-Apr-22

Remarks:

QC Reviewer: *Y W Fung* Signature: *[Signature]* Date: *3-May-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/m ³) 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: Ywiny

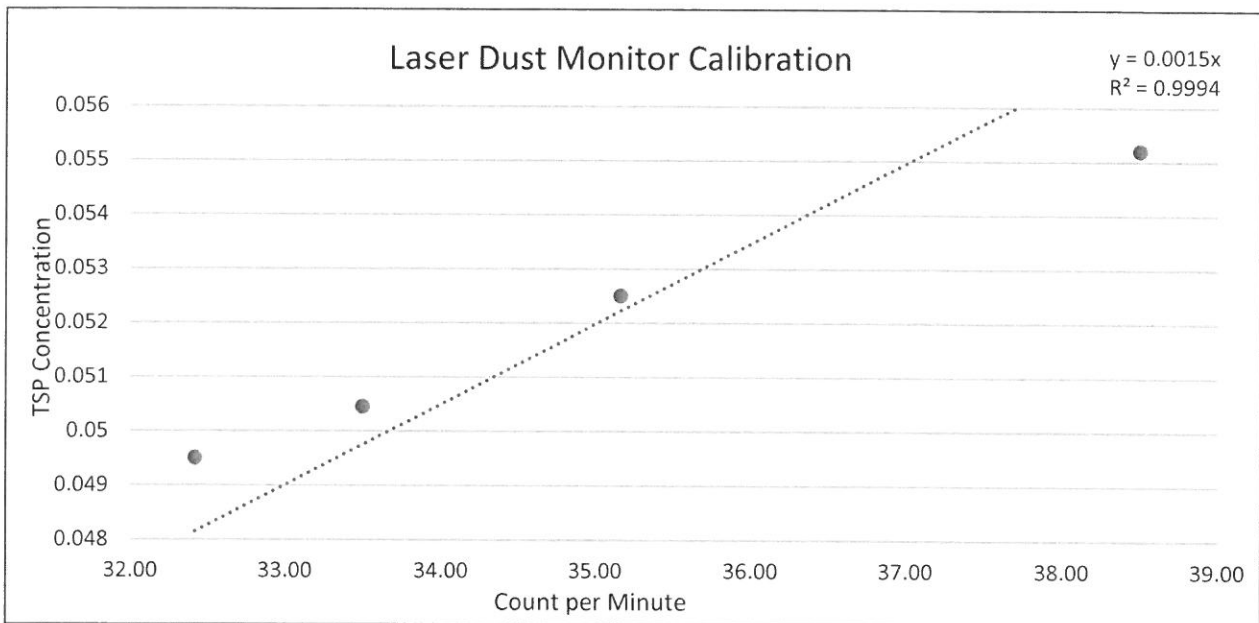
Signature: Y

Date: 3-May-21

Laser Dust Monitor Calibration

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

Hour	Count/Minute X-axis	Concentration (mg/m3) Y-axis
1	32.42	0.0495
2	33.50	0.0505
3	35.17	0.0525
4	38.50	0.0552

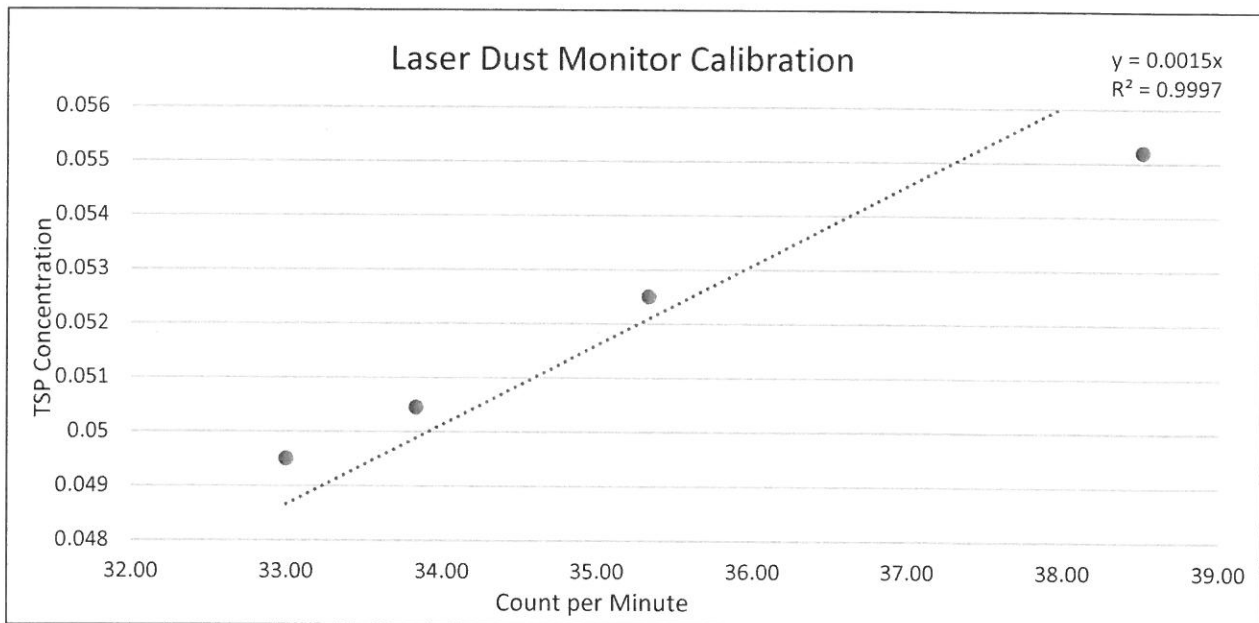


Prepare by: Mike Shek (MSKM)
Date: 30-Apr-21

Laser Dust Monitor Calibration

Type: Laser Dust Monitor
Manufacturer/Brand: SIBATA
Model No.: LD-3
Equipment No.: A.005.09a
Sensitivity Adjustment
Scale Setting: 797 CPM

Hour	Count/Minute X-axis	Concentration (mg/m3) Y-axis
1	33.00	0.0495
2	33.83	0.0505
3	35.33	0.0525
4	38.50	0.0552



Prepare by: Mike Shek (MSKM)
Date: 30-Apr-21



CERTIFICATE OF CALIBRATION

Certificate No.: 20CA1019 02-01

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	4950	ZC0032
Serial/Equipment No.:	3001291	3005374	23853
Adaptors used:	-	-	-

Item submitted by

Customer Name: AECOM ASIA CO LIMITED
Address of Customer: -
Request No.: -
Date of receipt: 19-Oct-2020

Date of test: 22-Oct-2020

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	61227	24-Dec-2020	CEPREI

Ambient conditions

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

Test specifications

- 1, 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.
- 2, 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 $\pm 20\%$.
- 3, 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 responses 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:

Feng Junqi

Date: 23-Oct-2020

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.: 20CA1019 02-01

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	
Time averaging	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	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:

Fung Chi Yip
22-Oct-2020

- End -

Checked by:

Date:

Feng Junqi
23-Oct-2020

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.: 20CA0914 02 Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone
Manufacturer:	B & K	B & K
Type/Model No.:	2238	4188
Serial/Equipment No.:	2800927	2250455
Adaptors used:	-	-

Item submitted by

Customer Name: AECOM ASIA CO., LTD.
Address of Customer: -
Request No.: -
Date of receipt: 14-Sep-2020

Date of test: 19-Sep-2020

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	61227	24-Dec-2020	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 1000 ± 5 hPa

Test specifications

- 1, 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.
- 2, 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 $\pm 20\%$.
- 3, 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:



Feng Junqi

Date: 20-Sep-2020

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.: 20CA0914 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:	Expanded 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	
	A	Pass	0.3	
Frequency weightings	C	Pass	0.3	
	Lin	Pass	0.3	
	Time weightings	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	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	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	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.

- End -

Calibrated by:

Date:

Fung Chi Yip

19-Sep-2020

Checked by:

Date:

Feng Junqi

20-Sep-2020

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.: 20CA1006 03

Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
Manufacturer: Rion Co., Ltd.
Type/Model No.: NC-74
Serial/Equipment No.: 34246490 / N.004.10
Adaptors used: -

Item submitted by

Customer: AECOM ASIA CO LIMITED
Address of Customer: -
Request No.: -
Date of receipt: 06-Oct-2020

Date of test: 12-Oct-2020

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: 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:



Feng Junqi

Date: 12-Oct-2020

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

Certificate No.: 20CA1019 02-02

Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
 Manufacturer: B & K
 Type/Model No.: 4231
 Serial/Equipment No.: 3014024 / N004.04
 Adaptors used: -

Item submitted by

Customer: AECOM ASIA CO LIMITED
 Address of Customer: -
 Request No.: -
 Date of receipt: 19-Oct-2020

Date of test: 22-Oct-2020

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	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: 1005 ± 5 hPa

Test specifications

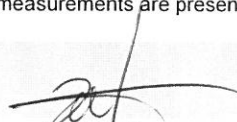
- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results 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:


 Feng Junqi

Date: 23-Oct-2020

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.

APPENDIX F

EM&A Monitoring Schedules

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-May
2-May	3-May	4-May	5-May	6-May	7-May	8-May
			24-hour TSP	1-hour TSP	Noise	
9-May	10-May	11-May	12-May	13-May	14-May	15-May
		24-hour TSP	1-hour TSP	Noise		
16-May	17-May	18-May	19-May	20-May	21-May	22-May
	24-hour TSP	1-hour TSP		Noise		24-hour TSP
23-May	24-May	25-May	26-May	27-May	28-May	29-May
	1-hour TSP	Noise			24-hour TSP	1-hour TSP
30-May	31-May					
	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 June 2021**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Jun	2-Jun	3-Jun	4-Jun	5-Jun
				24-hour TSP	1-hour TSP	
6-Jun	7-Jun	8-Jun	9-Jun	10-Jun	11-Jun	12-Jun
	Noise		24-hour TSP	1-hour TSP		
13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun
		24-hour TSP	1-hour TSP	Noise		
20-Jun	21-Jun	22-Jun	23-Jun	24-Jun	25-Jun	26-Jun
	24-hour TSP	1-hour TSP	Noise			24-hour TSP
27-Jun	28-Jun	29-Jun	30-Jun			
	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 July 2021**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1-Jul	2-Jul	3-Jul
					24-hour TSP Noise	1-hour TSP
4-Jul	5-Jul	6-Jul	7-Jul	8-Jul	9-Jul	10-Jul
			Noise	24-hour TSP	1-hour TSP	
11-Jul	12-Jul	13-Jul	14-Jul	15-Jul	16-Jul	17-Jul
			24-hour TSP	1-hour TSP	Noise	
18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul	24-Jul
		24-hour TSP	1-hour TSP	Noise		
25-Jul	26-Jul	27-Jul	28-Jul	29-Jul	30-Jul	31-Jul
	24-hour TSP	1-hour TSP	Noise			24-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 August 2021**

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

APPENDIX G

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

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		
5-May-21	0:00	6-May-21	0:00	Sunny	26.6	1015.4	1.34	1.34	1.34	1928.2	2.6862	2.8123	0.1261	26831.01	26855.01	24.00	65.4
11-May-21	0:00	12-May-21	0:00	Sunny	29.2	1008.4	1.34	1.34	1.34	1928.2	2.6641	2.7614	0.0973	26855.01	26879.01	24.00	50.5
17-May-21	0:00	18-May-21	0:00	Sunny	30.4	1009.8	1.34	1.34	1.34	1928.2	2.6647	2.7373	0.0726	26879.01	26903.01	24.00	37.7
22-May-21	0:00	23-May-21	0:00	Sunny	30.5	1007.0	1.34	1.34	1.34	1928.2	2.6527	2.7079	0.0552	26903.01	26927.01	24.00	28.6
28-May-21	0:00	29-May-21	0:00	Sunny	30.6	1009.6	1.34	1.34	1.34	1928.2	2.7077	2.7613	0.0536	26927.01	26951.01	24.00	27.8
Average																42.0	
Minimum																27.8	
Maximum																65.4	

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		
5-May-21	0:00	6-May-21	0:00	Sunny	26.6	1015.4	1.33	1.33	1.33	1921.0	2.6936	2.7776	0.0840	9576.39	9600.39	24.00	43.7
11-May-21	0:00	12-May-21	0:00	Sunny	29.2	1008.4	1.33	1.33	1.33	1921.0	2.6900	2.7339	0.0439	9600.39	9624.39	24.00	22.9
17-May-21	0:00	18-May-21	0:00	Sunny	30.4	1009.8	1.33	1.33	1.33	1921.0	2.6643	2.7023	0.0380	9624.39	9648.39	24.00	19.8
22-May-21	0:00	23-May-21	0:00	Sunny	30.5	1007.0	1.33	1.33	1.33	1921.0	2.6655	2.7001	0.0346	9648.39	9672.39	24.00	18.0
28-May-21	0:00	29-May-21	0:00	Sunny	30.6	1009.6	1.33	1.33	1.33	1921.0	2.7200	2.7503	0.0303	9672.39	9696.39	24.00	15.8
Average																24.0	
Minimum																15.8	
Maximum																43.7	

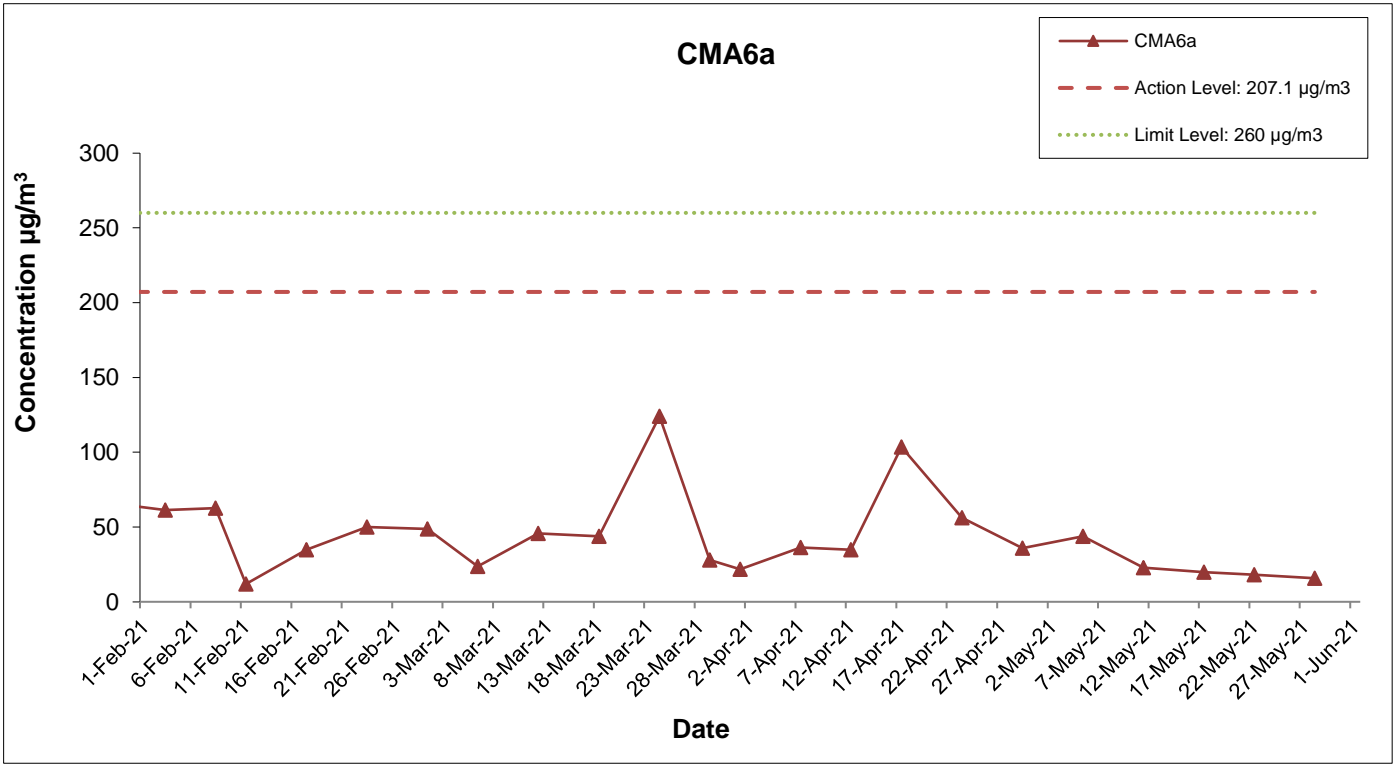
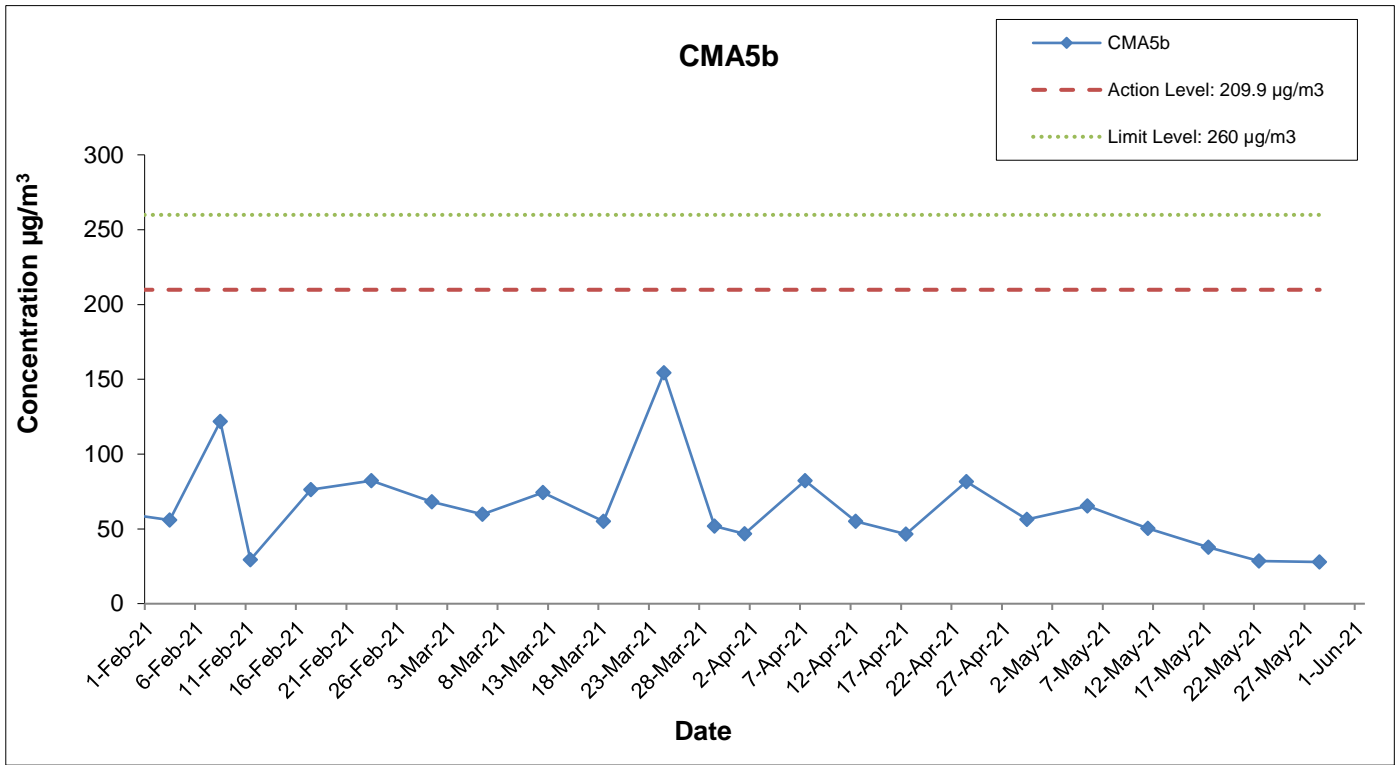
Appendix G
Air Quality Monitoring Results

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. ($\mu\text{g}/\text{m}^3$)
6-May-21	13:35	Fine	66.5	66.1	65.0
12-May-21	13:15	Sunny	60.4	62.7	64.6
18-May-21	13:50	Sunny	68.2	66.9	68.8
24-May-21	14:30	Fine	52.7	53.2	54.9
29-May-21	14:10	Sunny	65.2	64.7	64.4
				Average	63.0
				Min	52.7
				Max	68.8

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. ($\mu\text{g}/\text{m}^3$)
6-May-21	14:00	Fine	61.9	62.7	63.4
12-May-21	13:05	Sunny	60.1	57.5	56.2
18-May-21	14:00	Sunny	64.0	62.0	61.7
24-May-21	14:00	Fine	52.4	51.9	50.0
29-May-21	13:50	Sunny	64.0	64.4	64.5
				Average	59.8
				Min	50.0
				Max	64.5



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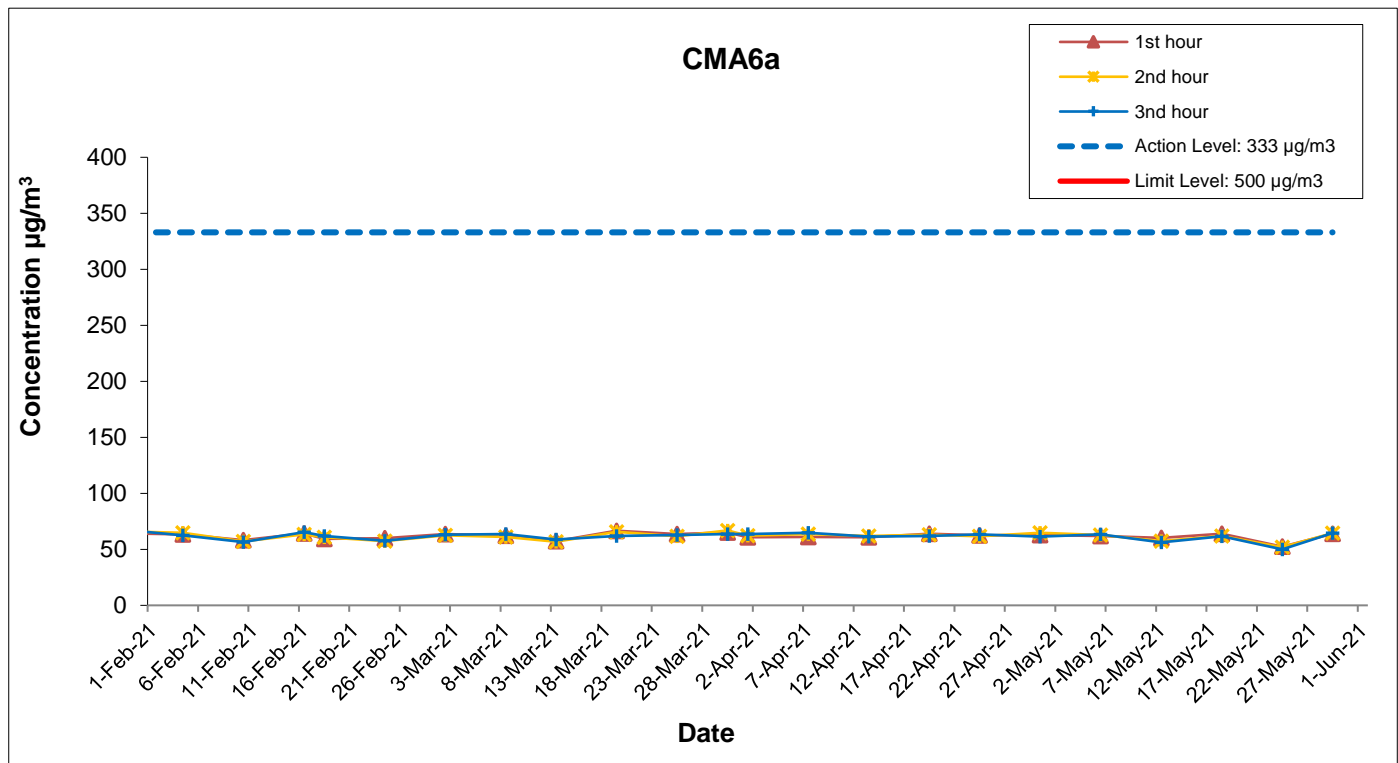
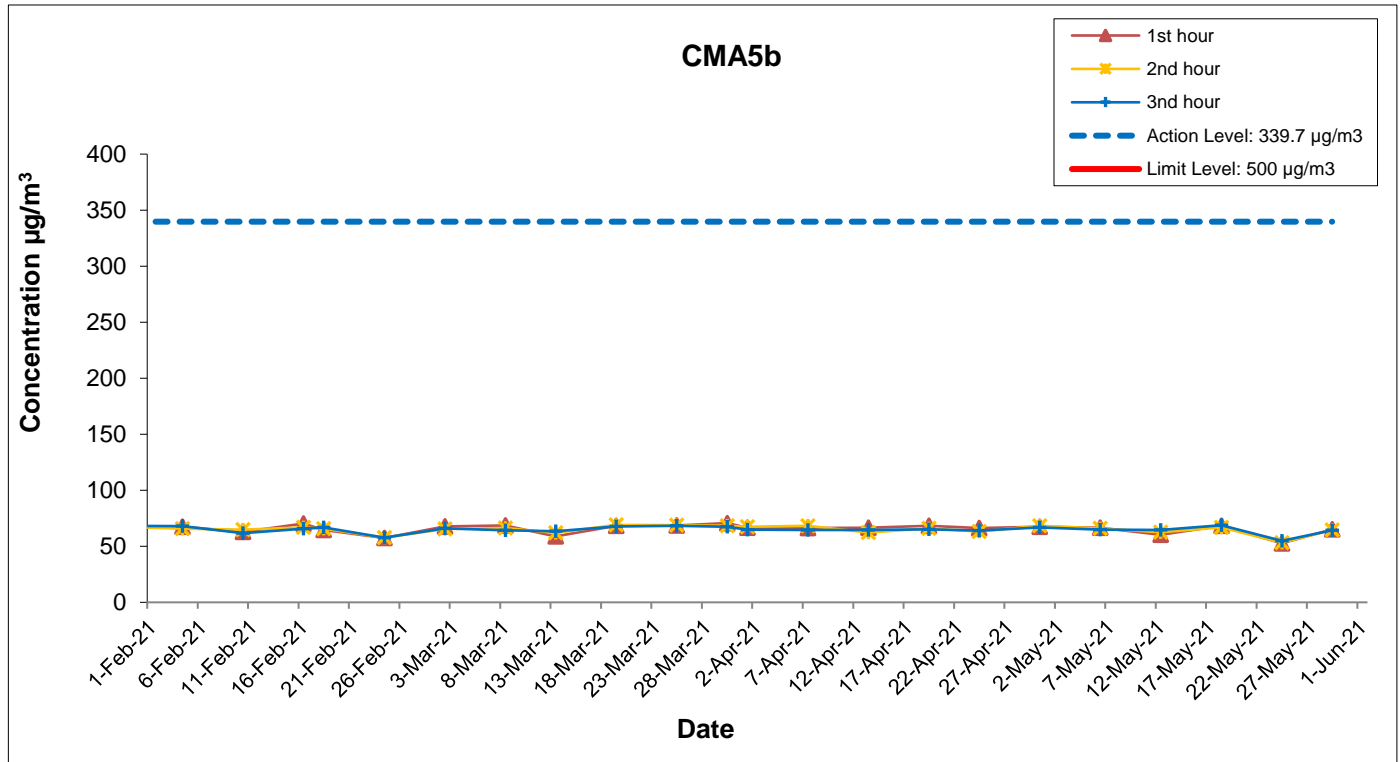
Shatin Central Link Contract No. 1123
 Entrusted Work for Road P2 & other roads and Slip Road 3



Graphical Presentation of Impact 24-hr TSP Monitoring Results

Date: June 2021

Appendix G



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

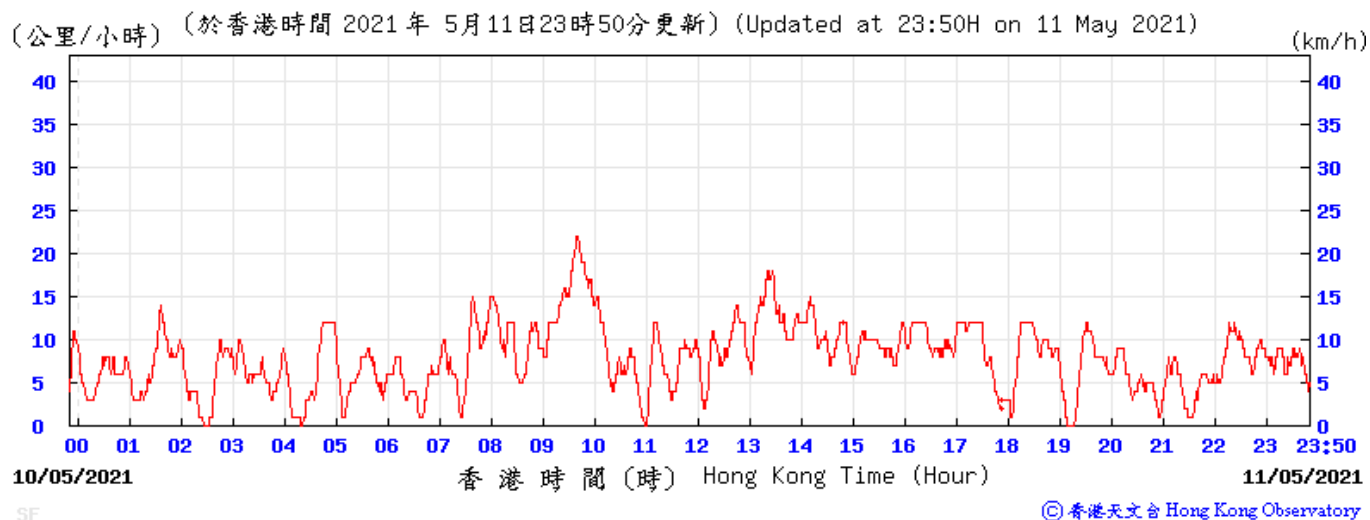


Graphical Presentation of Impact 1-hr TSP Monitoring Results

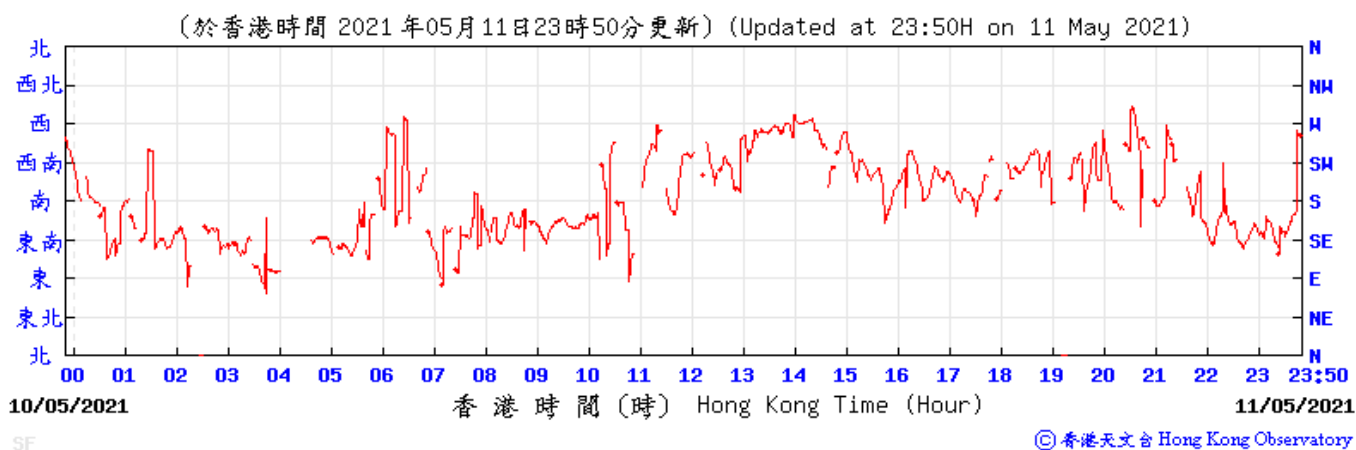
Date: June 2021

Appendix G

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

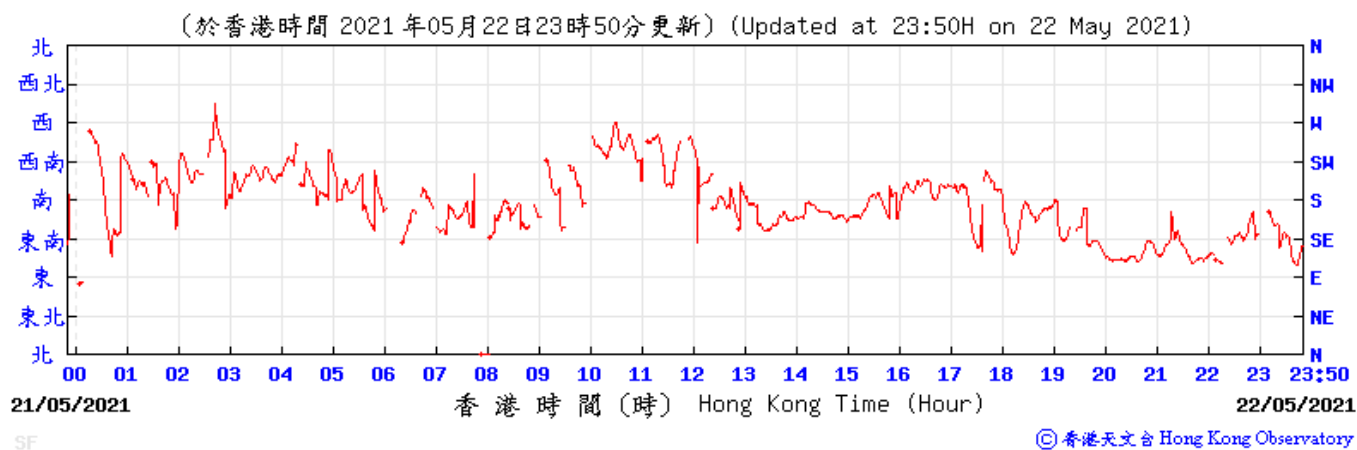
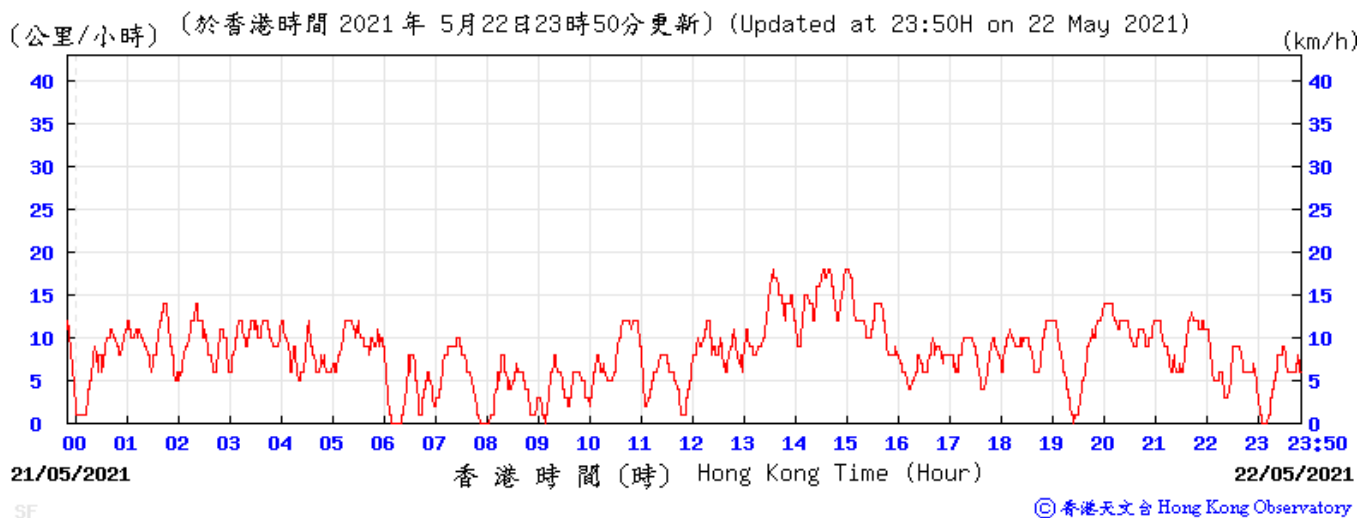


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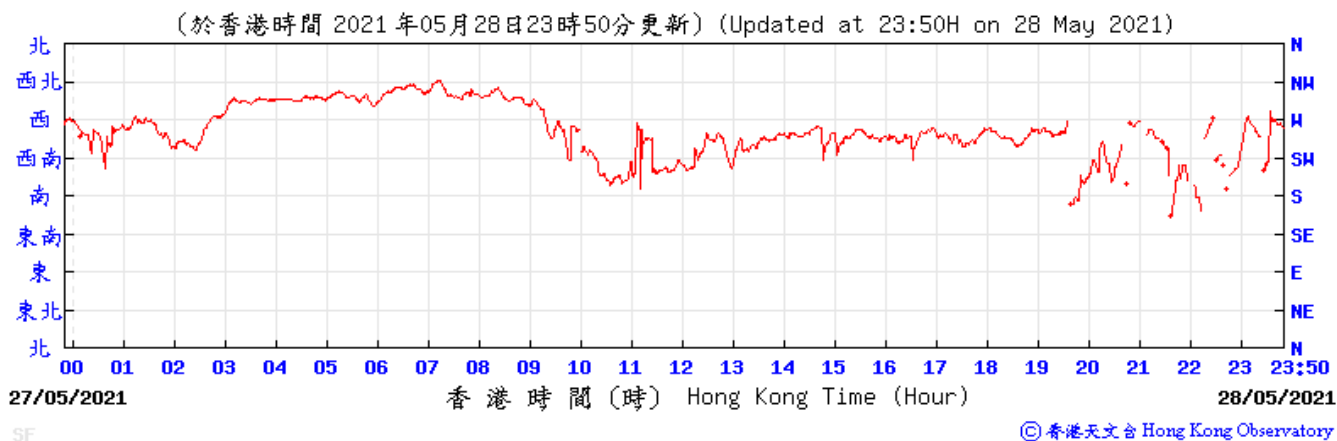
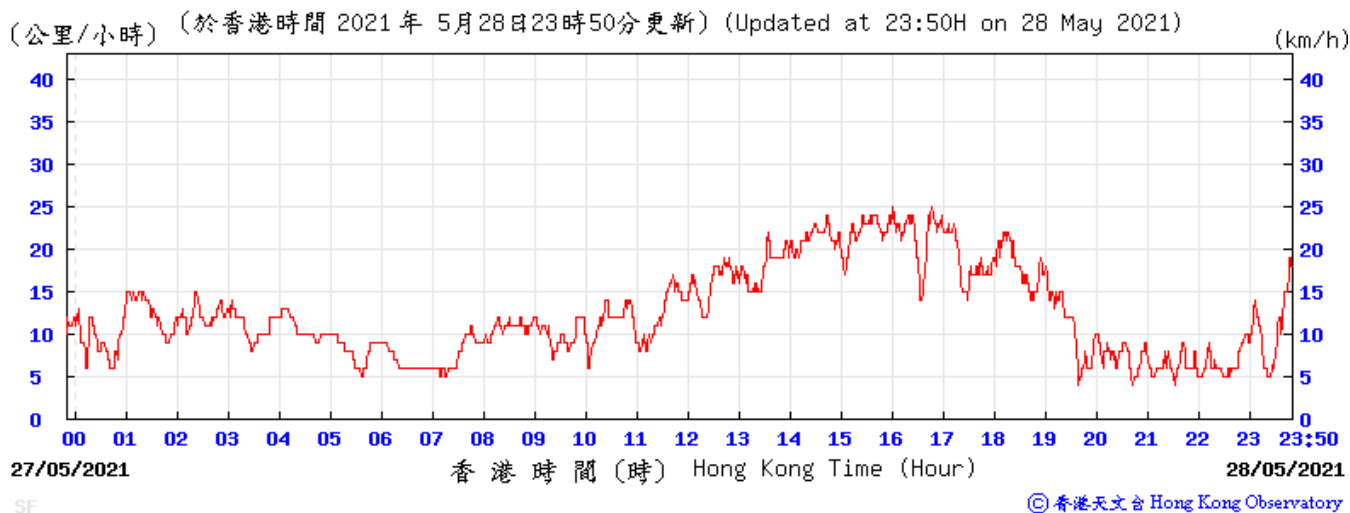


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Appendix G – Extract of Meteorological Observations for Star Ferry Automatic Weather Station, May 2021



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



APPENDIX H

**Noise Monitoring Results and
their Graphical Presentations**

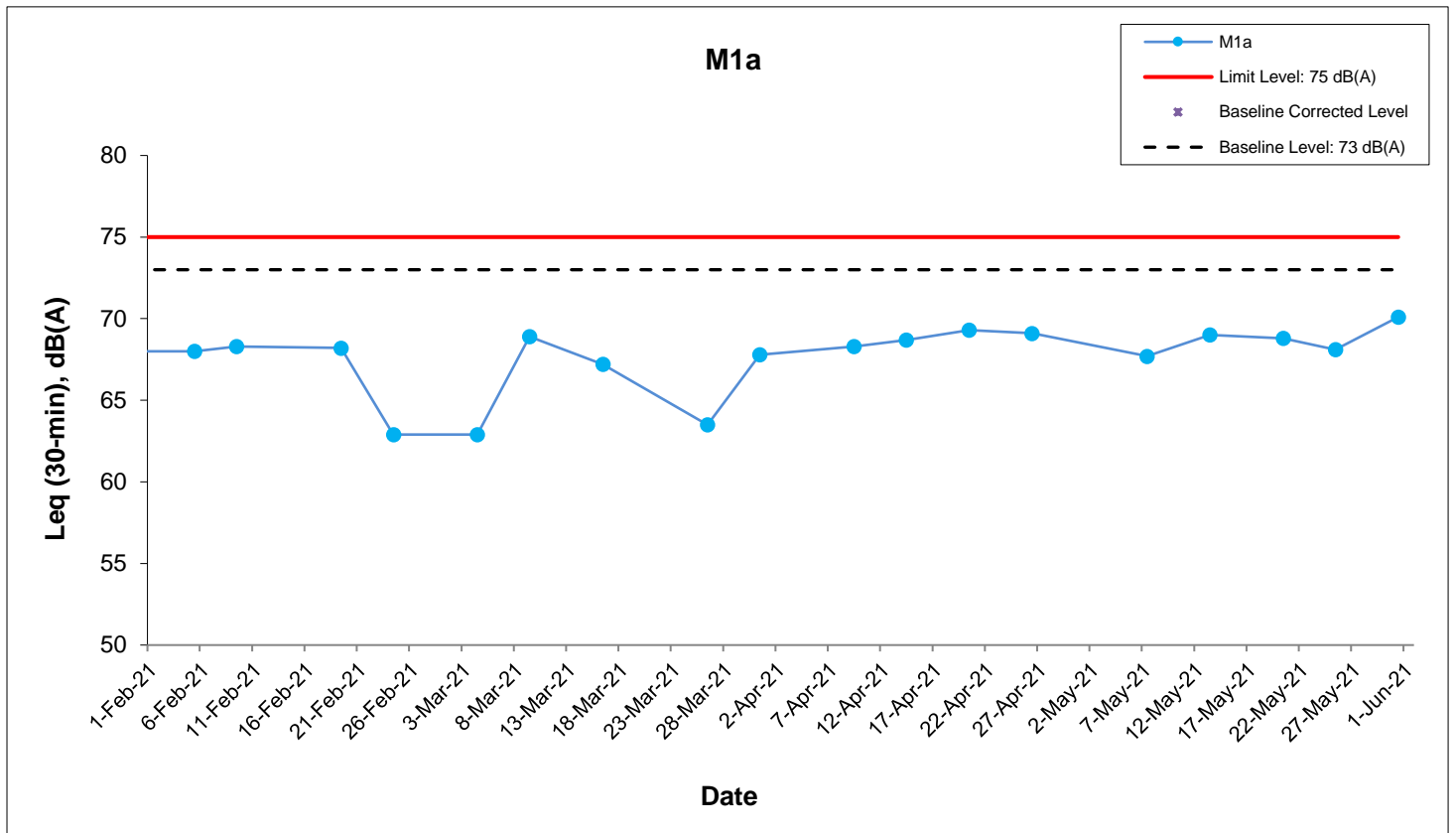
Appendix H Regular Construction Noise Monitoring Results

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				
7-May-21	Sunny	14:25	65.0	69.5	67.7	<Baseline	73.0	75	N
13-May-21	Fine	13:10	66.8	71.4	69.0	<Baseline	73.0	75	N
20-May-21	Sunny	14:00	66.5	71.0	68.8	<Baseline	73.0	75	N
25-May-21	Sunny	13:10	66.0	69.5	68.1	<Baseline	73.0	75	N
31-May-21	Fine	10:00	68.4	70.9	70.1	<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

Date: June 2021

Appendix H

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 J

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: May 2021

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)	
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													
Sub-total	3.173	0.000	0.000	0.000	3.173	0.148	0.000	0.000	0.000	0.000	0.000	0.000	0.000
July													
August													
September													
October													
November													
December													
Total	3.173	0.000	0.000	0.000	3.173	0.148	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Comments:

- 1) Assumption: The densities of Rock, Soil, Mixed Rock and Soil, and Regular Spoil are 2.0 ton/m³; the density of general refuse is 1.0 ton/m³; the density of waste oil is 1.0 kg/L.
- 2) The cut-off date of waste amount in April is 31/5/2021 for Public Fill Facilities and Landfill.
- 3) The amounts of waste in May is 0 ton for Landfill and 351.69 tons for Public Fill.
- 4) The amount of import fill in May is 0 ton, for cut-off date as 31/5/2021.
- 5) The amount of metal waste generated in May is 0 kg, for cut-off date as 31/5/2021.
- 6) The amount of paper waste generated in May is 0 kg, for cut-off date as 31/5/2021.
- 7) The amount of plastic waste generated in May is 0 kg, for cut-off date as 31/5/2021.