China State Construction Engineering (Hong Kong) Ltd.

Contract No. CV/2007/03

Development at Anderson Road – Site Formation and Associated Infrastructure Works

Monthly EM&A Report for August 2018

September 2018

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Version: 0	Date: 27 September 2018

Disclaimer

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RAMBOLL

Ref.: OAPANDSNEM00_0_2071L.18

19 September 2018

Engineer's Representative
Ove Arup & Partners
Level 5, Festival Walk
80 Tat Chee Avenue
Kowloon Tong, Kowloon
Hong Kong

By Post and Fax: 2407 8382

Attention: Mr. YK Cheung

Dear Sir,

Re: Contract No. CV/2007/03 (Environmental Permit No. EP -140/2002)
Development at Anderson Road
Site Formation and Associated Infrastructure Works
Monthly EM&A Report for August 2018

Reference is made to the Environmental Team's submission of the draft Monthly EM&A Report for August 2018 received by e-mail on 19 September 2018 for our review and comment.

Please be informed that we have no adverse comment on the captioned submission. We write to verify the captioned submission in accordance with Condition 3.3 of the Environmental Permit No. EP-140/2002.

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

Yours faithfully,

David Yeung
Independent Environmental Checker

c.c.	AECOM	Attn.: Mr. Y. W. Fung	By Fax: 3922 9797
	CSCEC	Attn.: Mr. Holmes Wong	By Email

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Table of Content

Page

List of Tables

List of Figures

List of Appendices

EXECUTIVE SUMMARY

The Project "Development at Anderson Road – Site Formation and Associated Infrastructure Works" (hereafter called "the Project") is proposed to form platforms for housing development and associated uses in area of about 20 hectares, and to carry out necessary infrastructural upgrading or improvement works to cater for the proposed development.

China State Construction Engineering (Hong Kong) Limited (CSCE) was commissioned as the Contractor of the Project. AECOM Asia Co. Ltd. (AECOM) was employed by CSCE as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) works for the Project.

The impact EM&A for the Project includes air quality and noise monitoring. The EM&A programme for Sau Ming Primary School (ID 4) and Sau Mau Ping Catholic Primary School (ID 5) commenced on 1 May 2008, while for Kwun Tong Government Secondary School (ID 1A), On Yat House (ID 2) and Sau Nga House (ID 3) commenced on 1 June 2008.

The monitoring stations ID 4 & ID 5 will serve both the entire Development of Anderson Road (Schedule 3 Designated Project (DP)) project as well as the Widening of Po Lam Road (Schedule 2 DP) project.

The construction for the Widening of Po Lam Road (Schedule 2 DP) project was commenced on 21 September 2011.

This report documents the findings of EM&A works for ID 1A, ID 2, ID 3, ID 4 and ID 5 conducted in the period between 1 and 31 August 2018. According to the Contractor, construction activities in the reporting period were:

- Site clearance works
- Defect rectification works
- Construction of planter
- Construction of handrail
- Sprayed concrete for slope
- Rock mesh installation
- Construction of surface channel

Breaches of Action and Limit Levels for Air Quality

All 1-hour TSP and 24-hour TSP results were below the Action and Limit Levels in the reporting month.

Breaches of Action and Limit Levels for Noise

According to the information provided by the Contractor, no Action Level exceedance of noise 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

According to the information provided by the Contractor, no environmental complaint and no 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 coming month included:-

- Properly store and label oil drums and chemical containers placed on site;
- Proper chemicals, chemical wastes and wastes management;
- Maintenance works should be carried out within roofed, paved areas with proper drainage system to handle run-off from maintenance works;
- Collection and segregation of construction waste and general refuse should be carried out properly and regularly;
- Site runoff should be properly collected and treated prior to discharge;
- Regular review and maintenance of drainage systems and desilting facilities;
- Exposed slopes/soil stockpiles should be properly treated to avoid generation of silty surface run-off during rainstorm;
- Proper mitigation measures should be provided to avoid relocation of treated contaminated soil;
- Regular review and maintenance of wheel washing facilities provided at all site entrances/exits;
- Suppress dust generated from work processes with use of bagged cements, earth movements, drilling works, breaking works, excavation activities, exposed areas/slopes/soil stockpiles and haul road traffic;
- Conduct regular inspection of the working machineries within works area to avoid any dark smoke emission and oil leakage;
- Quieter powered mechanical equipment should be used;
- Provision of proper and effective noise control measures, such as erection of movable noise barriers during blasting, breaking and drilling works and at crushing plant works area and provision of acoustic material wrapping to breaking tips of breakers; and
- Proper protection and regular inspection of existing trees, transplanted/retained trees.

1 INTRODUCTION

1.1 Background

1.1.1 The Project site is located in the East Kowloon District. It is bounded by Anderson Road to the north, the realigned Sau Mau Ping Road to the south, Po Lam Road to the east, and Lee On Road and Shun On Road to the west.

1.1.2 The objective of the Project "Development at Anderson Road Site Formation and Associated Infrastructure Works" under Contract CV/2007/03 (hereafter called "the Project") is to provide land for constructing public housing and government and public facilities. The development will provide 16,100 public housing units for 48,000 people in phases between 2015 and 2016.

1.1.3 The scope of works of this Project includes construction of site formation, roads, drains and upgrading of existing infrastructure to provide usable land of about 20 hectares for housing and associated government, institution or community uses at the site between existing Anderson Road Quarry and Sau Mau Ping Road in Kwun Tong District.

1.1.4 The Project was anticipated to be completed in the fourth quarter of 2016.

1.1.5 Part of the Project involving widening of existing Po Lam Road is a designated project and is governed by an Environmental Permit (EP) EP-140/2002, while the rest of the Project is non-designated. Baseline monitoring covering the entire Project site was undertaken and baseline monitoring report was prepared prior to commencement of construction of the Project in accordance with Conditions 3.2 and 3.4 of the EP (EP-140/2002) and the Environmental Monitoring and Audit (EM&A) Manual. The construction for the Widening of Po Lam Road was commenced on 21 September 2011.

1.1.6 According to the EP and the EM&A Manual of the Project, there is a need of an EM&A programme including air quality and noise monitoring.

1.1.7 The EM&A programme for Sau Ming Primary School (ID 4) and Sau Mau Ping Catholic Primary School (ID 5) commenced on 1 May 2008, while for Kwun Tong Government Secondary School (ID 1A), On Yat House (ID 2) and Sau Nga House (ID 3) commenced on 1 June 2008.

1.1.8 The monitoring stations ID 4 & ID 5 will serve both the entire Development of Anderson Road (Schedule 3 Designated Project (DP)) project as well as the Widening of Po Lam Road. (Schedule 2 DP) project.

1.1.9 AECOM Asia Co. Ltd. (AECOM) was employed by the Contractor, China State Construction Engineering (Hong Kong) Limited (CSCE), as the Environmental Team (ET) to undertake the EM&A works for the Project. In accordance with the EM&A Manual of the Project, environmental monitoring of air quality, noise and environmental site inspections would be required for this Project.

1.2 Scope of Report

1.2.1 This is the 132nd monthly EM&A Report under the Contract CV/2007/03 - Development at Anderson Road – Site Formation and Associated Infrastructure Works. This report presents a summary of the environmental monitoring and audit works, list of activities and mitigation measures proposed by the ET for the Project in August 2018 for ID 1A, ID 2, ID 3, ID 4 and ID 5.

1.3 Project Organization

1.3.1 The project organization structure is shown in Appendix A. The key personnel contact names and numbers are summarized in Table 1.1.

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone	Fax
ER (Ove Arup)	Senior Resident Engineer	Cliff Ko	2407 0300	2407 8382
	Assistant Resident Engineer (Civil)	Brian Wan	2407 0300	2407 8382
IEC (Ramboll)	Independent Environmental Checker	David Yeung	3465 2888	3465 2899
Contractor (CSCE)	Site Agent	Holmes Wong	2704 2095	2702 6553
	Safety and Environmental Officer	Raymond Ma	6221 9331	2702 6553
ET (AECOM)	ET Leader	Yiu Wah Fung	3922 9366	2317 7609

1.4 Summary of Construction Works

1.4.1 According to the Contractor, the Contactor has carried out the following major activities in the reporting month:

- Site clearance works
- Defect rectification works
- Construction of planter
- Construction of handrail
- Sprayed concrete for slope
- Rock mesh installation
- Construction of surface channel

1.4.2 The general layout plan of the Project site showing the contract area is shown in Figure 1.1.

1.4.3 The environmental mitigation measures implementation schedule are presented in Appendix B.

1.5 Summary of EM&A Programme Requirements

1.5.1 The EM&A programme required environmental monitoring for air quality, noise and environmental site inspections for air quality, noise, water quality, chemical and waste management. The EM&A requirements for each parameter described in the following sections include:-

- All monitoring parameters;
- Monitoring schedules for the reporting month and forthcoming months;
- Action and Limit levels for all environmental parameters;
- Event / Action Plan;
- Environmental mitigation measures, as recommended in the Project EIA study final report; and
- Environmental requirement in contract documents.

2 AIR QUALITY MONITORING

2.1 Monitoring Requirements

2.1.1 In accordance with the EM&A Manual, 1-hour and 24-hour TSP levels at 5 air quality monitoring stations were established. Impact 1-hour TSP monitoring was conducted for at least three times every 6 days, while impact 24-hour TSP monitoring was carried out for at least once every 6 days. The Action and Limit level of the air quality monitoring is provided in Appendix C.

2.2 Monitoring Equipment

2.2.1 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) located at each designated monitoring station. The HVS meets all the requirements of the EM&A Manual. Portable direct reading dust meters were used to carry out the 1-hour TSP monitoring. Brand and model of the equipment is given in Table 2.1.

Table 2.1 Air Quality Monitoring Equipment

Equipment	Brand and Model
Portable direct reading dust meter (1-hour TSP)	Sibata Digital Dust Monitor (Model No. LD-3 and LD-3B)
High Volume Sampler (24-hour TSP)	Tisch Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. TE-5170) & Graseby High Volume TSP Sampler (Model No. GMW 2310)
Calibration Kit for High Volume Sampler	Orifice (Model No. TE-5025A)

2.3 Monitoring Locations

2.3.1 Monitoring stations, ID 2, ID 3, ID 4 and ID 5, were set up at the proposed locations in accordance with EM&A Manual, while monitoring station, ID 1A, was set up at a location agreed by the ER and IEC. Figure 2.1 shows the locations of the monitoring stations. Table 2.2 describes the details of the monitoring stations.

Table 2.2 Locations of Air Quality Monitoring Stations

ID	Location	Monitoring Station
1A	Kwun Tong Government Secondary School	Roof top of the premises facing Anderson Road
2	On Yat House	Roof top of the premises facing Lee On Road
3	Sau Nga House	Roof top of the premises facing Sau Mau Ping Road
4	Sau Ming Primary School	Roof top of the premises
5	Sau Mau Ping Catholic Primary School	Roof top of the premises

2.4 Monitoring Parameters, Frequency and Duration

2.4.1 Table 2.3 summarizes the monitoring parameters, frequency and duration of impact TSP monitoring.

Table 2.3 Air Quality Monitoring Parameters, Frequency and Duration

Monitoring Station	Parameter	Frequency and Duration
ID 1A, ID 2, ID 3, ID 4 & ID5	1-hour TSP	At least 3 times every 6 days
	24-hour TSP	At least once every 6 days

2.5 Monitoring Methodology

2.5.1 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:-

(i) A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
(ii) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
(iii) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
(iv) A minimum of 2 meters separation from any supporting structure, measured horizontally is required.
(v) No furnace or incinerator flues nearby.
(vi) Airflow around the sampler was unrestricted.
(vii) Permission was obtained to set up the samplers and access to the monitoring stations.
(viii) A secured supply of electricity was obtained to operate the samplers.
(ix) The sampler was located more than 20 meters from any dripline.
(x) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.
(xi) Flow control accuracy was kept within ±2.5% deviation over 24-hour sampling period.

(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 ±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 m^3/min, and complied with the range specified in the EM&A Manual (i.e. 0.6-1.7 m^3/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 plastic 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 D.

2.5.2 1-hour TSP Monitoring

(a) Measuring Procedures

The measuring procedures of the 1-hour dust meter were 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 D.

2.6 Monitoring Schedule for the Reporting Month

2.6.1 The schedule for environmental monitoring in August 2018 is provided in Appendix E.

2.7 Monitoring Results

2.7.1 The monitoring results for 1-hour TSP and 24-hour TSP are summarized in Tables 2.4 and 2.5 respectively. Detailed air quality monitoring results are presented in Appendix F.

Table 2.4 Summary of 1-hour TSP Monitoring Results in the Reporting Period

	Average (μg/m³)	Range (μg/m³)	Action Level (μg/m³)	Limit Level (μg/m³)
ID 1A	67.7	64.2 – 71.3	201.5	500
ID 2	68.2	64.8 – 72.2	197.0	500
ID 3	68.9	65.5 – 71.8	203.7	500
ID 4	69.2	64.2 – 72.9	264.6	500
ID 5	67.9	61.9 – 72.3	267.4	500

Table 2.5 Summary of 24-hour TSP Monitoring Results in the Reporting Period

	Average (μg/m³)	Range (μg/m³)	Action Level (μg/m³)	Limit Level (μg/m³)
ID 1A	25.1	10.5 – 52.6	170.2	260
ID 2	33.9	16.9 – 75.5	200.0	260
ID 3	33.6	10.7 – 89.6	200.0	260
ID 4	34.2	17.8 – 78.7	181.3	260
ID 5	19.6	8.5 – 29.6	180.8	260

2.7.2 All 1-hour TSP and 24-hour TSP results were below the Action and Limit Levels in the reporting month.

2.7.3 The event action plan is annexed in Appendix I.

2.7.4 Major dust sources during the dust monitoring included construction dust from the Project site, construction dust from other construction sites nearby and nearby traffic emission.

2.7.5 Weather information including wind speed and wind direction is annexed in Appendix H. The information was obtained from Hong Kong Observatory Tseung Kwan O Automatic Weather Station and Anemometer Station.

3 NOISE MONITORING

3.1 Monitoring Requirements

3.1.1 In accordance with the EM&A Manual, impact noise levels should be obtained at 5 noise monitoring stations. Impact noise monitoring was conducted for at least once per week during the construction phase of the Project. The Action and Limit level of the noise monitoring is provided in Appendix C.

3.2 Monitoring Equipment

3.2.1 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 3.1.

Table 3.1 Noise Monitoring Equipment

Equipment	Brand and Model
Integrated Sound Level Meter	B&K (Model No. 2238 and 2250-L)
Acoustic Calibrator	Rion (Model No. NC-74)

3.3 Monitoring Locations

3.3.1 Monitoring stations, ID 2, ID3, ID 4 and ID 5, were set up at the proposed locations in accordance with EM&A Manual, while monitoring station, ID 1A, was set up at a location agreed by the ER and IEC. Figure 2.1 shows the locations of the monitoring stations. Table 3.2 describes the details of the monitoring stations.

Table 3.2 Locations of Impact Noise Monitoring Stations

ID	Location	Monitoring Station
1A	Kwun Tong Government Secondary School	1m from the exterior of the roof top façade of the premises facing Anderson Road
2	On Yat House	1m from the exterior of the roof top façade of the premises facing Lee On Road
3	Sau Nga House	1m from the exterior of the roof top façade of the premises facing Sau Mau Ping Road
4	Sau Ming Primary School	1m from the exterior of the roof top façade of the premises facing Sau Mau Ping Road
5	Sau Mau Ping Catholic Primary School	1m from the exterior of the roof top façade of the premises facing Po Lam Road

3.4 Monitoring Parameters, Frequency and Duration

3.4.1 Table 3.3 summarizes the monitoring parameters, frequency and duration of impact noise monitoring.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Monitoring Station	Parameter and Duration	Frequency
ID 1A, ID 2, ID 3, ID 4 & ID5	30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays. L_{eq}, L_{10} and L_{90} would be recorded.	At least once per week

3.5 Monitoring Methodology

3.5.1 Monitoring Procedure

(a) The sound level meter was set on a tripod at a height of 1.2 m above the ground.

(b) Façade measurements were made at all monitoring locations.

(c) The battery condition was checked to ensure the correct functioning of the meter.

(d) 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. 07:00 – 1900 on normal weekdays; $L_{eq(5\text{-}minutes)}$ during restricted hours i.e. 19:00 – 23:00 and 23:00 – 07:00 of normal weekdays, whole day of Sundays and Public Holidays

(e) Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94dB(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.

(f) 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.

(g) 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.

(h) 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.

3.5.2 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 D.

3.6 Monitoring Schedule for the Reporting Month

3.6.1 The schedule for environmental monitoring in August 2018 is provided in Appendix E.

3.7 Monitoring Results

3.7.1 The monitoring results for noise are summarized in Table 3.4 and the monitoring data is provided in Appendix G.

Table 3.4 Summary of Impact Noise Monitoring Results in the Reporting Period

	Average, dB(A), $L_{eq\ (30\ mins)}$	Range, dB(A), $L_{eq\ (30\ mins)}$	Limit Level, dB(A), $L_{eq\ (30\ mins)}$
ID 1A	60.5	60.2 – 61.0	*65/70
ID 2	58.5	52.9 – 61.8	75
ID 3	59.1	58.2 – 60.9	75
ID 4	60.9	54.2 – 65.1	*65/70
ID 5	61.8	53.2 – 64.2	*65/70

Note: *Daytime noise Limit Level of 70dB (A) applies to education institutions while 65dB (A) applies during school examination period.

3.7.2 According to the information provided by the Contractor, no Action Level exceedance of noise was recorded since no noise related complaint was received in the reporting month.

3.7.3 No Limit Level exceedance of noise was recorded at all monitoring stations in the reporting month.

3.7.4 The event action plan is annexed in Appendix I.

3.7.5 Major noise sources during the noise monitoring included construction noise from the Project site, construction noise from other construction sites nearby, nearby traffic noise and noise from school activities and community noise.

4 ENVIRONMENTAL SITE INSPECTION AND AUDIT

4.1 Site Inspection

4.1.1 Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. In the reporting month, 5 site inspections were carried out on 2, 9, 16, 23 and 30 August2018. Particular observations and status of non-compliance are described below.

4.1.2 The Contractor rectified most of the observations as identified during the environmental site inspections in the reporting month within the agreed time frame. Rectification of the remaining identified items are being carried out by the Contractor. Most of identified items were rectified within one week, except for two outstanding observations recorded on 29 July 2018 and 16 August 2018. Follow-up inspections on the status of implementation of mitigation measures were conducted to ensure all the identified items were mitigated properly.

4.1.3 One outstanding item recorded on 19 July 2018 was rectified in this reporting month. The U-channel was blocked by soil and the Contractor was advised to remove the soil. The items was rectified on 23 August 2018.

4.1.4 Another outstanding item regarding the accumulation of general refuse was recorded on 16 August 2018. The Contractor was advised to keep the working area tidy. The item was rectified on 30 August 2018.

4.1.5 Air Quality Impact

- No specific observation was identified in the reporting month.

4.1.6 Construction Noise Impact

- No specific observation was identified in the reporting month.

4.1.7 Water Quality Impact

- Drainage system was blocked by C&D waste. The Contractor was advised to removed the C&D waste and keep the drainage system clean.

4.1.8 Chemical and Waste Management

- Improper storage of chemical container was observed. The Contractor was advised to store the chemical container in drip tray.
- Drainage system was blocked by C&D waste. The Contractor was advised to removed the C&D waste and keep the drainage system clean.

4.1.9 Landscape and Visual Impact

- No specific observation was identified in the reporting month.

4.1.10 Miscellaneous

- Different types of waste were cumulated in construction site. The Contractor was advised to improve the site housekeeping and keep the construction site tidy up.

4.2 Advice on the Solid and Liquid Waste Management Status

4.2.1 The Contractor is registered as a chemical waste producer for this Project. C&D materials and wastes sorting were carried out on site. Receptacles were available for C&D wastes and general refuse collection.

4.2.2 As advised by the Contractor, 0 tonnes of C&D materials were generated on site in the reporting month.

For C&D waste, 0 kg of metals was generated and collected by registered recycling collector. 0 kg of paper cardboard packaging and 0 kg of plastics were generated on site and collected by registered recycling collector. No chemical waste was collected by licensed chemical waste collectors. 0 kg of other types of wastes (e.g. general refuse and tree debris) were generated on site and disposed of at North East New Territories (NENT) Landfill.

4.2.3 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.

4.2.4 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.

4.3 Environmental Licenses and Permits

4.3.1 The environmental licenses and permits for this Project and valid in the reporting month is summarized in Table 4.1.

Table 4.1 Summary of Environmental Licensing and Permit Status

Statutory Reference	Description	Permit No.	Valid Period		Remarks
			From	To	
EIAO	Environmental Permit	EP-140/2002	--	--	- Widening of a section of Po Lam Road
APCO	NA notification	--	16/04/09	--	- Whole Construction Site
WPCO	Discharge Licence	WT00023593-2016	20/01/16	19/01/21	- Discharge of Construction Runoff
WDO	Chemical Waste Producer Registration	5213-292-C3249-32	19/03/08	--	- Whole Construction Site
	Waste Charges Account	7006839	12/03/08	--	- Whole Construction Site

4.4 Implementation Status of Environmental Mitigation Measures

4.4.1 In response to the site audit findings, the Contractor carried out corrective actions promptly for particular items recorded. Most of the identified items were rectified within one week, except for two outstanding observations recorded on 19 July 2018 and 16 August 2018.

4.4.2 One outstanding item recorded on 19 July 2018 was rectified in this reporting month. The U-channel was blocked by soil and the Contractor was advised to remove the soil. The items was rectified on 23 August 2018.

4.4.3 Another outstanding item regarding the accumulation of general refuse was recorded on 16 August 2018. The Contractor was advised to keep the working area tidy. The item was rectified on 30 August 2018.

4.4.4 A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in Appendix B. Many necessary mitigation measures were implemented properly.

4.5 Summary of Exceedances of the Environmental Quality Performance Limit

4.5.1 All 1-hour TSP and 24-hour TSP results were below the Action and Limit Levels in the reporting month.

4.5.2 According to the information provided by the Contractor, no Action Level exceedance of noise was recorded since no noise related complaint was received in the reporting month.

4.5.3 No Limit Level exceedance of noise was recorded at all monitoring stations in the reporting month.

4.5.4 Cumulative statistics on exceedances is provided in Appendix J.

4.6 Summary of Complaints, Notification of Summons and Successful Prosecutions

4.6.1 Complaints shall be referred to the ET Leader for action. The ET Leader shall undertake the following procedures upon receipt of any complaint:-

- Log complaint and date of receipt onto the complaint database and inform the IC(E) immediately;
- Investigate the complaint to determine its validity, and assess whether the source of the problem is due to works activities;
- Identify mitigation measures in consultation with the IC(E) if a complaint is valid and due to works;
- Advise the Contractor if additional mitigation measures are required;
- Review the Contractor's response to identified mitigation measures, and the updated situation;
- If the complaint is transferred from EPD, submit interim report to EPD on status of the complaint investigation and follow-up action within the time frame assigned by EPD;
- Undertake additional monitoring and audit to verify the situation if necessary, and review that circumstances leading to the complaint to not recur;
- Report investigation results and subsequent actions to complainant (if the source of complaint is EPD, the results should be reported within the time frame assigned by EPD); and
- Record the complaint, investigation, the subsequent actions and the results in the monthly EM&A reports.

4.6.2 During any complaint investigation work, the Contractor and the ER shall cooperate with the ET Leader in providing all necessary information and assistance for completion of the investigation. If mitigation measures are identified in the investigation, the Contractor shall promptly carry out the mitigation. The ER shall ensure that all necessary measures have been carried out by the Contractor.

4.6.3 Referring to the information provided by the Contractor, no environmental complaint and no notification of summons and successful prosecution were received in the reporting month.

4.6.4 Cumulative statistics on complaints, notification of summons and successful prosecutions is provided in Appendix J.

5 FUTURE KEY ISSUES

5.1 Construction Programme for the Coming Two Months

5.1.1 The major construction works in September and October 2018 will be:

- Site clearance works
- Defect rectification works
- Installation of ID tag in Manhole / Chamber / Catchpit
- Construction of planter
- Construction of handrail
- Construction of surface channel
- Sprayed concrete for slope
- Rock mesh installation

5.2 Key Issues for the Coming Two Months

5.2.1 Key issues to be considered in the coming months included:

- Properly store and label oil drums and chemical containers placed on site;
- Proper chemicals, chemical wastes and wastes management;
- Maintenance works should be carried out within roofed, paved areas with proper drainage system to handle run-off from maintenance works;
- Collection and segregation of construction waste and general refuse should be carried out properly and regularly;
- Site runoff should be properly collected and treated prior to discharge;
- Regular review and maintenance of drainage systems and desilting facilities;
- Exposed slopes/soil stockpiles should be properly treated to avoid generation of silty surface run-off during rainstorm;
- Proper mitigation measures should be provided to avoid relocation of treated contaminated soil;
- Regular review and maintenance of wheel washing facilities provided at all site entrances/exits;
- Suppress dust generated from work processes with use of bagged cements, earth movements, drilling works, breaking works, excavation activities, exposed areas/slopes/soil stockpiles and haul road traffic;
- Conduct regular inspection of the working machineries within works area to avoid any dark smoke emission and oil leakage;
- Quieter powered mechanical equipment should be used;
- Provision of proper and effective noise control measures, such as erection of movable noise barriers during blasting, breaking and drilling works and at crushing plant works area and provision of acoustic material wrapping to breaking tips of breakers; and
- Proper protection and regular inspection of existing trees, transplanted/retained trees.

5.3 Monitoring Schedule for the Coming Month

5.3.1 The tentative schedule for environmental monitoring in September 2018 is provided in Appendix E.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

6.1.1 The construction phase of the project commenced in May 2008.

6.1.2 1-hour TSP, 24-hour TSP and noise monitoring were carried out in the reporting month.

6.1.3 All 1-hour TSP and 24-hour TSP results were below the Action and Limit Levels in the reporting month.

6.1.4 No Action Level exceedance of noise was recorded at all monitoring stations in the reporting month.

6.1.5 No Limit Level exceedance of noise was recorded at all monitoring stations in the reporting month.

6.1.6 Environmental site inspections were carried out 5 times in August 2018. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audit. Most of the identified items were rectified within one week, except for two outstanding observations recorded on 19 July 2018 and 16 August 2018.

6.1.7 According to the information provided by the Contractor, no environmental complaint and no notification of summons and successful prosecution were received in the reporting month.

6.2 Recommendations

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

Air Quality Impact

- No specific observation was identified in the reporting month.

Construction Noise Impact

- No specific observation was identified in the reporting month.

Water Quality Impact

- The Contractor was advised to removed the C&D waste and make sure the drainage system was unblocked.

Chemical and Waste Management

- The Contractor was advised to store the chemical container in drip tray.
- The Contractor was advised to removed the C&D waste and make sure the drainage system was unblocked.

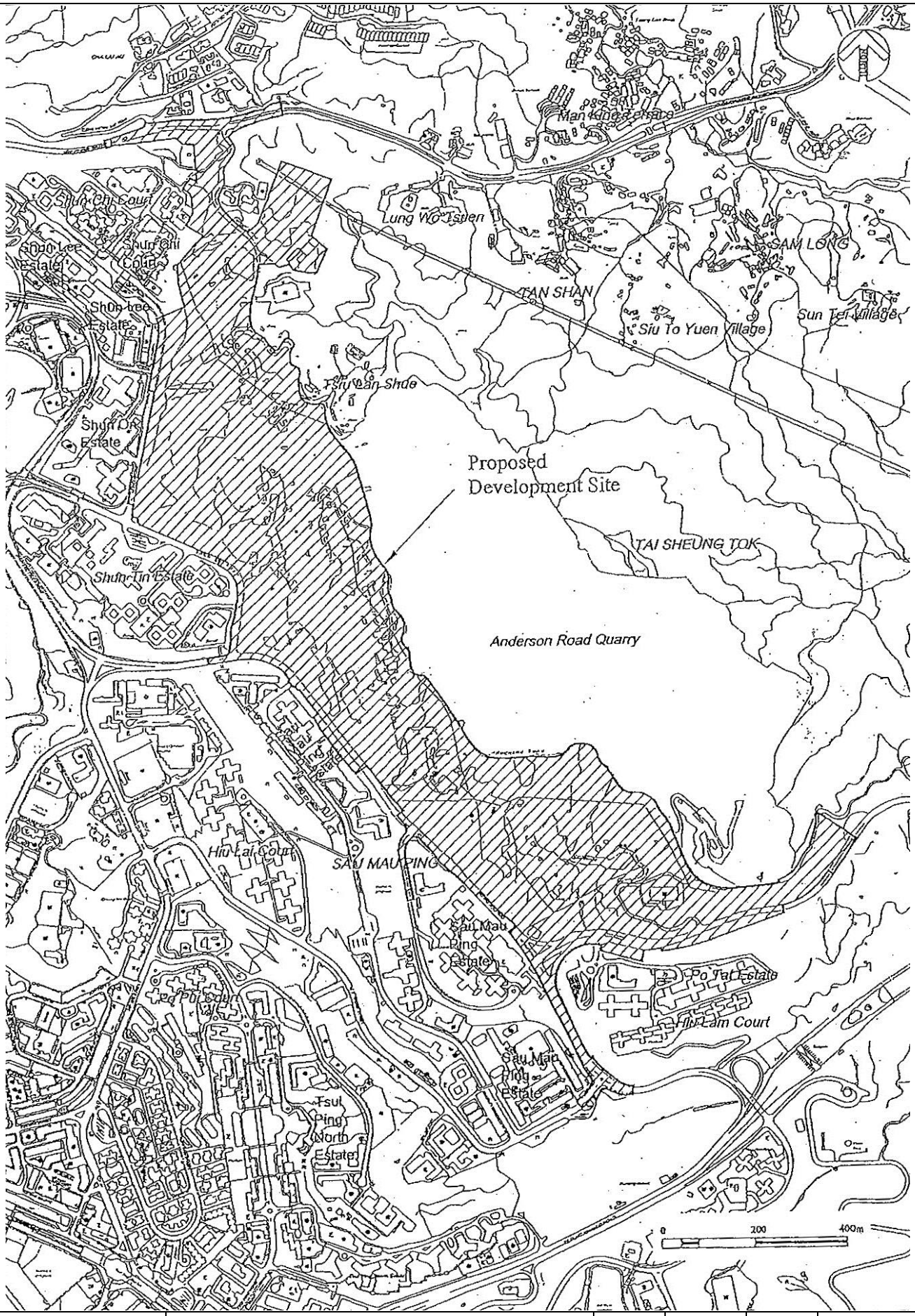
Landscape and Visual Impact

- No specific observation was identified in the reporting month.

Miscellaneous

- The Contractor was advised to keep the construction site tidy up and improve the site housekeeping.

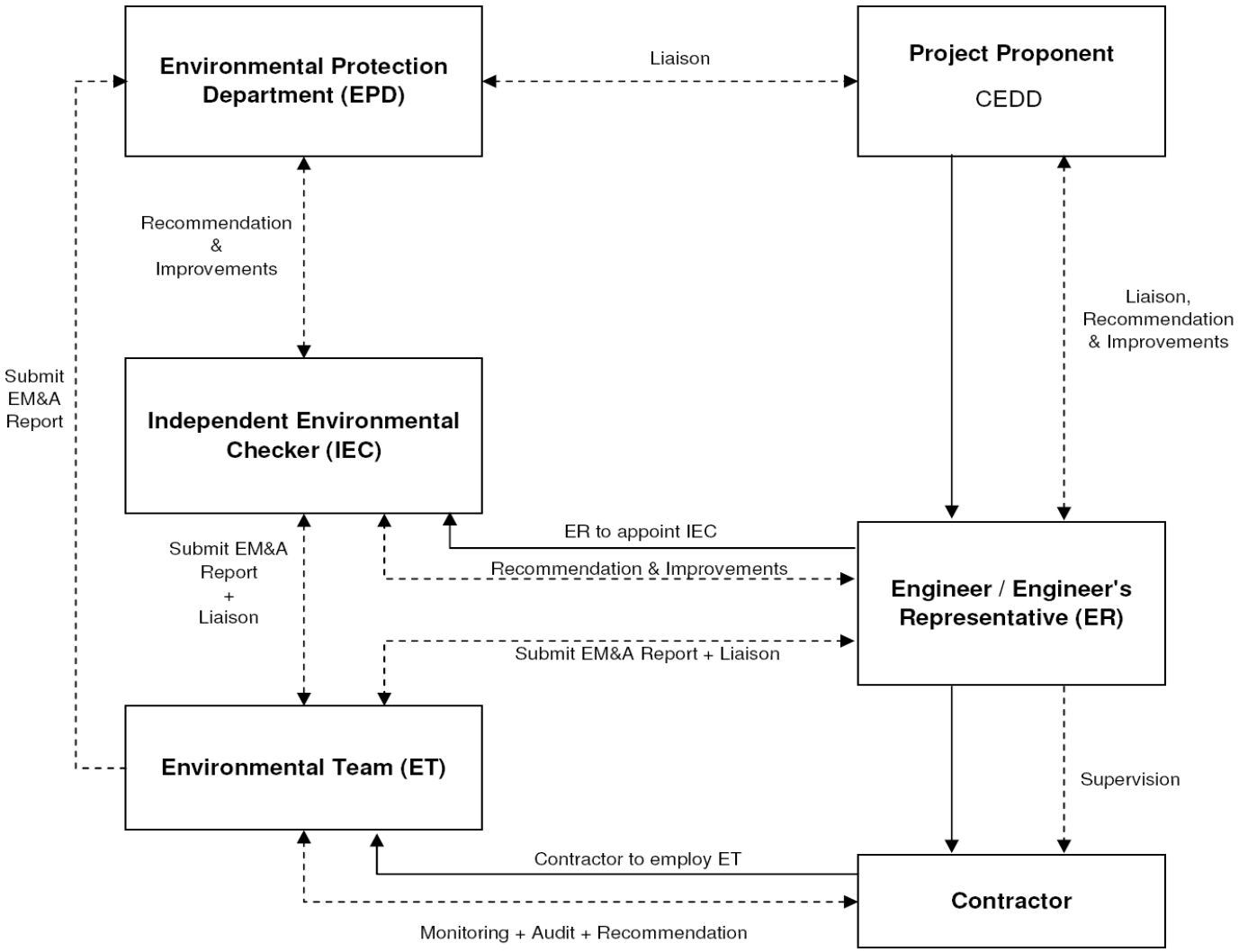
FIGURES



AECOM	**Development at Anderson Road - Site Formation and Associated Infrastructure Works**	SCALE	N.T.S.	DATE	Nov-09
		CHECK	ENFL	DRAWN	LCHC
	GENERAL LAYOUT PLAN	JOB NO.	60043155	**DRAWING No.** FIG 1.1	**Rev.** -

APPENDIX A

Project Organization Structure



Employment Relationship

Working Relationship

AECOM	Contract No. CV/2007/03 Development at Anderson Road – Site Formation and Associated Infrastructure Works **Project Organization Structure**	SCALE	N.T.S.	DATE	2009
		CHECK	ENFL	DRAWN	LCHC
		JOB NO.	60043155	APPENDIX A	Rev -

APPENDIX B

Implementation Schedule of Environmental Mitigation Measures

Appendix B - Implementation Schedule of Environmental Mitigation Measures

Environmental Mitigation Measures		Location	Implementation Status
Construction Noise Impact			
Site Formation	Silenced powered mechanical equipment (PME) for most equipment (including drill rig, backhoe, dump truck, breaker and crane) and the decrease of percentage on time usage of drill rig among the Central Area from 50% to 40% is proposed.	All construction sites	V
	Temporary movable noise barrier shall be used to shield the noise emanating from the drilling rig in order to provide adequate shielding for the affected NSRs.	All construction sites	V
Construction Air Quality Impact			
General Site Practice	Mean vehicle speed of haulage trucks at 10km/hr.	All construction sites	V
	Twice daily watering of all open site areas.	All construction sites	V
	Regular watering (once every 1 hour) of all site roads and access roads with frequent truck movement.	All construction sites	V
	During road transportation of excavated spoil, vehicles should be covered to avoid dust impact. Wheel washing facilities should be installed at all site exits together with regular watering of the site access roads.	All construction sites	V
	Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.	All construction sites	V
	Establishment and use of vehicle wheel and body washing facilities at the exit points of the site, combined with cleaning of public roads were necessary.	Site exits	V

General Site Practice	Suitable side and tailboards on haulage vehicles.	All construction sites	V
	Watering of temporary stockpiles.	All construction sites	V
Blasting	Use of select aggregate and fines to stem the charge with drill holes and watering of blast face.	All construction sites	N/A
	Use of vacuum extraction drilling methods.	All construction sites	N/A
	Carefully sequenced blasting.	All construction sites	N/A
Crushing	Fabric filters installed for the crushing plant.	All construction sites	N/A
	Water sprays on the crusher.	All construction sites	N/A
Loading and Unloading Points, and conveyor Belt System	Water sprays at all fixed loading and unloading points (at the crusher and conveyor belts).	All construction sites	N/A
	The loading point at the crusher is enclosed with dust collection system installed.	All construction sites	N/A
	When transferring materials from conveyor belt or crusher to the dump trucks or chutes, dust curtains are used for controlling dust.	All construction sites	N/A
	Cover the conveyor belts with steel roof and canvas sides.	All construction sites	N/A
Construction Water Quality Impact			
Construction Phase	All active working areas should be bounded to retain storm water with sufficient retention time to ensure that suspended solids are not discharged from the site in concentrations above those specified in the TM for the Victoria Harbour (Phase I) WCZ. All fuel storage areas should be bounded with drainage directed to an oil interceptor.	Site drainage system	@

	Separate treatment facilities may be required for effluent from site offices, toilets (unless chemical toilets are used) and canteens.	Site drainage system	V
	Discharged wastewater from the construction sites to surface water and/or public drainage systems should be controlled through licensing. Discharge should follow fully the terms and conditions in the licenses.	All works area	V
	Relevant practice for dealing with various type of construction discharges provided in EPD's ProPECC Note PN 1/94 should be adopted.	All works area	V
Waste Management			
Waste Disposal	Different types of wastes should be segregated, stored, transported and disposed of separately in accordance with the relevant legislative requirements and guidelines as proper practice of waste management.	All construction sites	@
	Sorting of wastes should be done on-site. Different types of wastes should be segregated and stored in different stockpiles, containers or skips to enhance recycling of materials and proper disposal of spoil.	All construction sites	V
	Excavated spoil should be used as much as possible to minimize off-side fill material requirements and disposal of spoil.	All construction sites	V
	Chemical waste should be recycled on-site or removed by licenced companies. It should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical wastes. When off-site	All construction sites	V

	disposal is required, it should be collected and delivered by licenced contractors to Tsing Yi Chemical Waste Treatment Facility and disposed of in accordance with the Chemical Waste (General) Regulation.		
	Necessary mitigation measures should be adopted to prevent the uncontrolled disposal of chemical and hazardous waste into air, soil, surface waters and ground waters.	All construction sites	V
Waste Storage	Chemical material storage areas should be bounded, constructed of impervious materials and have the capacity to contain 120 percent of the total volume of the containers. Indoor storage areas must have sufficient ventilation to prevent the build-up of fumes, and must be capable of evacuating the space in the event of an accidental release. Outdoor storage areas must be covered with a canopy or contain provisions for the safe removal of rainwater. In both cases, storage areas must not be connected to the foul or stormwater sewer system.	All construction sites	@
	Dangerous materials as defined under the DGO, including fuel, oil and lubricants, should be stored and properly labelled on site in accordance with the requirements in the DGO. If transportation of hazardous materials is necessary, hazardous materials, chemical wastes and fuel should be packed or stored in containers or vessels of suitable design and construction to prevent leakage, spillage or escape.	All construction sites	V
	Human waste should be discharged into septic tanks provided by the contractors and removed regularly by a hygiene services company. Refuse containers such as open skips should be provided at every work site for use	All construction sites	V

	by the workforce. On-site refuse collection points must also be provided.		
Landscape and Visual			
Additional Measures	Planting and vegetation restoration (including transplanted trees) on soil slopes including restoration of grassland, scrub and woodland on slopes around the development platforms and access road. Restoration would be undertaken using predominantly native species.	Whole development	V
Additional Measures	Screen planting along the access roads, to limit impacts of elevated structures and rock slopes.	Whole development	V
	Colouring of shotcrete slopes.	Whole development	V
	Limited planting on shotcrete slopes.	Whole development	V
	Landscape buffers and planting in and around the development itself to screen partially close views of the site.	Whole development	V
	Screen planting in front of retaining walls / granite cladding to those walls to reduce glare and visual impacts.	Whole development	V
	Careful design of road elevated structure and abutments, to limit visual impacts.	Whole development	V
	Roadside landscape features / hardworks to limit visual impacts.	Whole development	V
	Conservation of CDG or CDV recovered from the site for re-use in the landscape restoration.	Whole development	V
	Preservation (by transplanting if necessary) of any trees identified as being of particular landscape value.	Whole development	V
Ecology			

	Woodland planting on soft cut slopes available (about 13.4ha) within the development site. Native species, preferably with documented ecological utility, should be used.	Soft cut slopes	V
	Seeds of the native species when possible should be added into the hydroseeding mix. Seedings should be pit planted with placement of slow release fertilizer.	Soft cut slopes	N/A
	Maintenance and service, including weeding, fertilizing, replacement of dead plants, etc. should be performed during the first 1 years of planting to enhance the survival rate of the plants.	Soft cut slopes	N/A
Contaminated Land			
	In accordance with the approved Contamination Assessment Report (CAR) and Remediation Action Plan (RAP) in Nov 2006, it is recommended that cement solidification / stabilization prior to on-site backfill for heavy metal contaminated soil and excavation followed by disposal at designated landfill for organic contaminated soil. Upon the completion of the proposed remediation exercise as outlined in CAR & RAP, a Remediation Report will be complied for submission to EPD to demonstrate that the proposed soil remediation has been carried out properly and satisfactorily. Results from the confirmation tests will also be included in the Remediation Report. Photos showing the area of excavation, the solidification process, and remediated soil and site shall also be included in the report for reference.	Locations specified in CAR	V
Landfill Gas Hazard			
	Further site investigation should be carried out during the detailed design	The whole development site	V

	stage in order to measure landfill gas around the perimeter of the site, to re-confirm that there is no preferential pathway for landfill gas migration and to assess the potential for landfill gas hazards on the future development. If a landfill gas hazard is identified, mitigation measures should be proposed and implemented to address the hazard.		

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

APPENDIX C

Summary of Action and Limit Levels

Appendix C - Summary of Action and Limit Levels

Table 1 – Action and Limit Levels for 1-hour TSP

Location	Action Level	Limit Level
ID 1A	201.5	500
ID 2	197.0	500
ID 3	203.7	500
ID 4	264.6	500
ID 5	267.4	500

Table 2 – Action and Limit Levels for 24-hour TSP

Location	Action Level	Limit Level
ID 1A	170.2	260
ID 2	200.0	260
ID 3	200.0	260
ID 4	181.3	260
ID 5	180.8	260

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

Location	Action Level	Limit Level
ID 1A	When one documented complaint is received from any one of the sensitive receivers	*65 / 70 dB(A)
ID 2		75 dB(A)
ID 3		75 dB(A)
ID 4		*65 / 70 dB(A)
ID 5		*65 / 70 dB(A)

*Daytime noise Limit Level of 70 dB(A) applies to education institutions, while 65dB(A) applies during school examination period

APPENDIX D

Calibration Certificates of Equipments

TISCH Environmental

RECALIBRATION DUE DATE:
December 26, 2018

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	December 26, 2017	**Rootsmeter S/N:** 438320	**Ta:** 291	°K
Operator:	Jim Tisch		**Pa:** 763.3	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **0843**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4140	3.2	2.00
2	3	4	1	1.0010	6.4	4.00
3	5	6	1	0.8910	7.9	5.00
4	7	8	1	0.8480	8.8	5.50
5	9	10	1	0.7030	12.7	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
1.0241	0.7243	1.4342	0.9958	0.7042	0.8732
1.0198	1.0188	2.0283	0.9916	0.9906	1.2349
1.0178	1.1423	2.2677	0.9896	1.1107	1.3807
1.0166	1.1988	2.3783	0.9885	1.1656	1.4481
1.0113	1.4386	2.8684	0.9834	1.3988	1.7464
QSTD	**m=**	**2.00314**	**QA**	**m=**	**1.25433**
	b=	**-0.01725**		**b=**	**-0.01050**
	r=	**0.99996**		**r=**	**0.99996**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

For subsequent flow rate calculations:

Qstd= $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

Qa= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg

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

RECALIBRATION

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

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

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

AECOM Asia Company Limited

Tisch TSP Mass Flow Controlled High Volume Air Sampler
Field Calibration Report

Station: Kwun Tong Government Secondary School (ID1A)
Operator: Shum Kam Yuen
Date: 6-Jul-18
Next Due Date: 6-Sep-18
Pump No.: 846
Verified Against: O.T.S -- 843
Equipment No.: A-001-64T
Expiration Date: 26-Dec-2018
Model: TE-5170

Ambient Condition					
Temperature, Ta	301	Kelvin	Pressure, Pa	761.5	mmHg

Orifice Transfer Standard Information					
Equipment No.:	843	Slope, mc	2.00314	Intercept, bc	-0.01725
Last Calibration Date:	26-Dec-17	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	26-Dec-18				

Calibration of TSP Sampler

Calibration Point	H in. of water	$[H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X - axis**	W in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	7.1	2.65	1.33	5.5	2.34
2	6.4	2.52	1.27	4.7	2.16
3	5.5	2.34	1.18	3.8	1.94
4	4.2	2.04	1.03	2.5	1.57
5	3.6	1.89	0.95	1.7	1.30

By Linear Regression of Y on X

Slope , mw = 2.6605 **Intercept, bw =** -1.2029

Correlation Coefficient* = 0.9987

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.21 m^3/min (43 CFM)

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

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

Therefore, Set Point $W = (m \times Qstd + b)^2 \times (760 / Pa) \times (Ta / 298) =$ **4.10**

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

Remarks:

QC Reviewer: WS CHAN Signature: Date: 06/07/18

AECOM Asia Company Limited

Graseby TSP Mass Flow Controlled High Volume Air Sampler
Field Calibration Report

Station: On Yat House (ID2)
Date: 20-Jul-18
Pump No.: 10373
Equipment No.: A-001-12T
Model: GMW 2310

Operator: Shum Kam Yuen
Next Due Date: 20-Sep-18
Verified Against: O.T.S -- 843
Expiration Date: 26-Dec-2018

Ambient Condition					
Temperature, Ta	305	Kelvin	Pressure, Pa	757.1	mmHg

Orifice Transfer Standard Information					
Equipment No.:	843	Slope, mc	2.00314	Intercept, bc	-0.01725
Last Calibration Date:	26-Dec-17	**mc x Qstd + bc = [H x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	26-Dec-18				

Calibration of TSP Sampler

Calibration Point	H in. of water	[H x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (m^3/min) **X - axis**	W in. of oil	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	7.1	2.63	1.32	5.4	2.29
2	6.2	2.46	1.24	4.5	2.09
3	5.1	2.23	1.12	3.1	1.74
4	4.1	2.00	1.01	2.3	1.50
5	3.0	1.71	0.86	1.3	1.12

By Linear Regression of Y on X

Slope , mw = 2.5449 **Intercept, bw =** -1.0769

Correlation Coefficient* = 0.9992

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.21 m^3/min (43 CFM)

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

m x Qstd + b = [W x (Pa/760) x (298/Ta)]$^{1/2}$

Therefore, Set Point W = (m x Qstd + b)^2 x (760 / Pa) x (Ta / 298) = **4.12**

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

Remarks:

QC Reviewer: WS CHAN Signature: Date: 20/07/18

AECOM Asia Company Limited

Tisch TSP Mass Flow Controlled High Volume Air Sampler Field Calibration Report

Station: Sau Nga House (ID3)
Date: 20-Jul-18
Pump No.: 3261
Equipment No.: A-001-77T
Model: TE-5170

Operator: Shum Kam Yuen
Next Due Date: 20-Sep-18
Verified Against: O.T.S -- 843
Expiration Date: 26-Dec-2018

Ambient Condition					
Temperature, Ta	305	Kelvin	Pressure, Pa	757.1	mmHg

Orifice Transfer Standard Information					
Equipment No.:	843	Slope, mc	2.00314	Intercept, bc	-0.01725
Last Calibration Date:	26-Dec-17	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	26-Dec-18				

Calibration of TSP Sampler

Calibration Point	H in. of water	$[H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X - axis**	W in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	7.2	2.65	1.33	5.1	2.23
2	6.2	2.46	1.24	4.3	2.05
3	5.5	2.31	1.16	3.6	1.87
4	4.2	2.02	1.02	2.4	1.53
5	3.0	1.71	0.86	1.5	1.21

By Linear Regression of Y on X

Slope , mw = **2.2060** **Intercept, bw =** **-0.6971**

Correlation Coefficient* = **0.9993**

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.21 m^3/min (43 CFM)

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

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

Therefore, Set Point W = $(m \times Qstd + b)^2 \times (760 / Pa) \times (Ta / 298)$ = **4.00**

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

Remarks:

QC Reviewer: LKS CHAN Signature: Date: 20/07/18

AECOM Asia Company Limited

Graseby TSP Mass Flow Controlled High Volume Air Sampler Field Calibration Report

Station: Sau Ming Primary School (ID4)
Date: 20-Jul-18
Pump No.: 1275
Equipment No.: A-001-28T
Model: GMW 2310

Operator: Shum Kam Yuen
Next Due Date: 20-Sep-18
Verified Against: O.T.S -- 843
Expiration Date: 26-Dec-2018

Ambient Condition					
Temperature, Ta	305	Kelvin	Pressure, Pa	757.1	mmHg

Orifice Transfer Standard Information					
Equipment No.:	843	Slope, mc	2.00314	Intercept, bc	-0.01725
Last Calibration Date:	26-Dec-17	$mc \times Qstd + bc = [H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	26-Dec-18				

Calibration of TSP Sampler

Calibration Point	H in. of water	$[H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (m^3/min) **X - axis**	W in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	7.1	2.63	1.32	5.2	2.25
2	6.1	2.44	1.23	4.2	2.02
3	5.0	2.21	1.11	3.4	1.82
4	3.9	1.95	0.98	2.4	1.53
5	3.0	1.71	0.86	1.6	1.25

By Linear Regression of Y on X

Slope , mw = 2.1266 **Intercept, bw =** -0.5653

Correlation Coefficient* = 0.9985

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.21 m^3/min (43 CFM)

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

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

Therefore, Set Point $W = (m \times Qstd + b)^2 \times (760 / Pa) \times (Ta / 298) =$ **4.14**

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

Remarks:

QC Reviewer: WS CHAN Signature: Date: 20/07/18

AECOM Asia Company Limited

Graseby TSP Mass Flow Controlled High Volume Air Sampler Field Calibration Report

Station: Sau Mau Ping Catholic Primary School (ID5)
Date: 20-Jul-18
Pump No.: 10088
Equipment No.: A-001-13T
Model: GMW 2310

Operator: Shum Kam Yuen
Next Due Date: 20-Sep-18
Verified Against: O.T.S -- 843
Expiration Date: 26-Dec-2018

Ambient Condition					
Temperature, Ta	305	Kelvin	Pressure, Pa	757.1	mmHg

Orifice Transfer Standard Information					
Equipment No.:	843	Slope, mc	2.00314	Intercept, bc	-0.01725
Last Calibration Date:	26-Dec-17	**mc x Qstd + bc = [H x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	26-Dec-18				

Calibration of TSP Sampler

Calibration Point	H in. of water	[H x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (m^3/min) **X - axis**	W in. of oil	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	7.1	2.63	1.32	5.5	2.31
2	6.0	2.42	1.22	4.5	2.09
3	5.2	2.25	1.13	3.4	1.82
4	4.1	2.00	1.01	2.6	1.59
5	3.2	1.76	0.89	1.7	1.29

By Linear Regression of Y on X

Slope , mw = 2.3686 **Intercept, bw =** -0.8186

Correlation Coefficient* = 0.9984

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 1.21 m^3/min (43 CFM)

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

m x Qstd + b = [W x (Pa/760) x (298/Ta)]$^{1/2}$

Therefore, Set Point W = (m x Qstd + b)^2 x (760 / Pa) x (Ta / 298) = **4.31**

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

Remarks:

QC Reviewer: WS CHAN Signature: [signature] Date: 20/07/18

EQUIPMENT CALIBRATION RECORD

Type:	***Laser Dust Monitor***
Manufacturer/Brand:	***SIBATA***
Model No.:	***LD-3***
Equipment No.:	***A.005.07a***
Sensitivity Adjustment Scale Setting:	***557 CPM***
Operator:	*Mike Shek (MSKM)*

Standard Equipment

Equipment:	*Rupprecht & Patashnick TEOM®*
Venue:	*Cyberport (Pui Ying Secondary School)*
Model No.:	*Series 1400AB*
Serial No:	Control: *140AB219899803*
	Sensor: *1200C143659803* K_o: *12500*
Last Calibration Date*:	*3 May 2018*

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): *557* CPM
Sensitivity Adjustment Scale Setting (After Calibration): *557* 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	*05-05-18*	*09:15 - 10:15*	*27.6*	*79*	*0.05367*	*2151*	*35.85*
2	*05-05-18*	*10:15 - 11:15*	*27.6*	*80*	*0.05864*	*2347*	*39.12*
3	*05-05-18*	*11:15 - 12:15*	*27.7*	*80*	*0.06661*	*2679*	*44.65*
4	*05-05-18*	*12:15 - 13:15*	*27.7*	*79*	*0.06335*	*2546*	*42.43*

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
2. Total Count was logged by Laser Dust Monitor
3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X
Slope (K-factor): *0.0015*
Correlation coefficient: *0.9994*

Validity of Calibration Record: *5 May 2019*

Remarks:

QC Reviewer: *YW Fung* Signature: Date: 07 May 2018

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:	*Rupprecht & Patashnick TEOM®*		
Venue:	*Cyberport (Pui Ying Secondary School)*		
Model No.:	*Series 1400AB*		
Serial No:	Control: *140AB219899803*		
	Sensor: *1200C143659803*	K_o: *12500*	
Last Calibration Date*:	*3 May 2018*		

*Remarks: Recommended interval for hardware calibration is 1 year

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	*05-05-18*	*09:45 - 10:45*	*27.6*	*79*	*0.05483*	*2176*	*36.26*
2	*05-05-18*	*10:45 - 11:45*	*27.7*	*80*	*0.05813*	*2324*	*38.73*
3	*05-05-18*	*11:45 - 12:45*	*27.7*	*79*	*0.06734*	*2701*	*45.02*
4	*05-05-18*	*12:45 - 13:45*	*27.7*	*79*	*0.06375*	*2545*	*42.41*

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
2. Total Count was logged by Laser Dust Monitor
3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X
Slope (K-factor): *0.0015*
Correlation coefficient: *0.9977*

Validity of Calibration Record: *5 May 2019*

Remarks:

QC Reviewer: *YW Fung* Signature: Date: 07 May 2018

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:	*Rupprecht & Patashnick TEOM®*
Venue:	*Cyberport (Pui Ying Secondary School)*
Model No.:	*Series 1400AB*
Serial No:	Control: *140AB219899803*
	Sensor: *1200C143659803* K_o: *12500*
Last Calibration Date*:	*3 May 2018*

*Remarks: Recommended interval for hardware calibration is 1 year

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	*05-05-18*	*10:00 - 11:00*	*27.7*	*80*	*0.05415*	*2164*	*36.06*
2	*05-05-18*	*11:00 - 12:00*	*27.7*	*80*	*0.05973*	*2375*	*39.58*
3	*05-05-18*	*12:00 - 13:00*	*27.7*	*79*	*0.06718*	*2693*	*44.88*
4	*05-05-18*	*13:00 - 14:00*	*27.7*	*80*	*0.06486*	*2587*	*43.11*

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
2. Total Count was logged by Laser Dust Monitor
3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X
Slope (K-factor): *0.0015*
Correlation coefficient: *0.9986*

Validity of Calibration Record: *5 May 2019*

Remarks:

QC Reviewer: *YW Fung* Signature: Date: 07 May 2018

EQUIPMENT CALIBRATION RECORD

Type: ***Laser Dust Monitor***
Manufacturer/Brand: ***SIBATA***
Model No.: ***LD-3***
Equipment No.: ***A.005.11a***
Sensitivity Adjustment Scale Setting: ***799 CPM***

Operator: *Mike Shek (MSKM)*

Standard Equipment

Equipment: *Rupprecht & Patashnick TEOM®*
Venue: *Cyberport (Pui Ying Secondary School)*
Model No.: *Series 1400AB*
Serial No: Control: *140AB219899803*
Sensor: *1200C143659803* K_o: *12500*
Last Calibration Date*: *3 May 2018*

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): *799* CPM
Sensitivity Adjustment Scale Setting (After Calibration): *799* 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	*06-05-18*	*10:00 - 11:00*	*27.9*	*80*	*0.05121*	*2045*	*34.08*
2	*06-05-18*	*11:00 - 12:00*	*27.9*	*81*	*0.05413*	*2164*	*36.06*
3	*06-05-18*	*12:00 - 13:00*	*27.9*	*80*	*0.05616*	*2252*	*37.53*
4	*06-05-18*	*13:00 - 14:00*	*28.0*	*80*	*0.05824*	*2321*	*38.68*

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
2. Total Count was logged by Laser Dust Monitor
3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X
Slope (K-factor): *0.0015*
Correlation coefficient: *0.9976*

Validity of Calibration Record: *6 May 2019*

Remarks:

QC Reviewer: *YW Fung* Signature: Date: 07 May 2018

EQUIPMENT CALIBRATION RECORD

Type:	***Laser Dust Monitor***
Manufacturer/Brand:	***SIBATA***
Model No.:	***LD-3B***
Equipment No.:	***A.005.13a***
Sensitivity Adjustment Scale Setting:	***643 CPM***
Operator:	*Mike Shek (MSKM)*

Standard Equipment

Equipment:	*Rupprecht & Patashnick TEOM®*		
Venue:	*Cyberport (Pui Ying Secondary School)*		
Model No.:	*Series 1400AB*		
Serial No:	Control: *140AB219899803*		
	Sensor: *1200C143659803*	K_o:	*12500*
Last Calibration Date*:	*3 May 2018*		

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): *643* CPM
Sensitivity Adjustment Scale Setting (After Calibration): *643* 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	*06-05-18*	*10:15 - 11:15*	*27.9*	*80*	*0.05124*	*2057*	*34.28*
2	*06-05-18*	*11:15 - 12:15*	*27.9*	*81*	*0.05453*	*2179*	*36.32*
3	*06-05-18*	*12:15 - 13:15*	*28.0*	*81*	*0.05658*	*2273*	*37.88*
4	*06-05-18*	*13:15 - 14:15*	*28.0*	*80*	*0.05736*	*2307*	*38.45*

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
2. Total Count was logged by Laser Dust Monitor
3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X
Slope (K-factor): *0.0015*
Correlation coefficient: *0.9968*

Validity of Calibration Record: *6 May 2019*

Remarks:

QC Reviewer: *YW Fung* Signature: Date: 07 May 2018

EQUIPMENT CALIBRATION RECORD

Type:	***Laser Dust Monitor***
Manufacturer/Brand:	***SIBATA***
Model No.:	***LD-3B***
Equipment No.:	***A.005.16a***
Sensitivity Adjustment Scale Setting:	***521 CPM***
Operator:	*Mike Shek (MSKM)*

Standard Equipment

Equipment:	*Rupprecht & Patashnick TEOM®*		
Venue:	*Cyberport (Pui Ying Secondary School)*		
Model No.:	*Series 1400AB*		
Serial No:	Control: *140AB219899803*		
	Sensor: *1200C143659803*	K_o: *12500*	
Last Calibration Date*:	*3 May 2018*		

*Remarks: Recommended interval for hardware calibration is 1 year

Calibration Result

Sensitivity Adjustment Scale Setting (Before Calibration): *521* CPM
Sensitivity Adjustment Scale Setting (After Calibration): *521* 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	*14-07-18*	*10:15 - 11:15*	*29.1*	*79*	*0.04328*	*1742*	*29.03*
2	*14-07-18*	*11:15 - 12:15*	*29.1*	*78*	*0.04673*	*1874*	*31.23*
3	*14-07-18*	*12:15 - 13:15*	*29.2*	*79*	*0.04904*	*1961*	*32.68*
4	*14-07-18*	*13:15 - 14:15*	*29.2*	*79*	*0.04734*	*1897*	*31.62*

Note: 1. Monitoring data was measured by Rupprecht & Patashnick TEOM®
2. Total Count was logged by Laser Dust Monitor
3. Count/minute was calculated by (Total Count/60)

By Linear Regression of Y or X
Slope (K-factor): *0.0015*
Correlation coefficient: *0.9974*

Validity of Calibration Record: *14 July 2019*

Remarks:

QC Reviewer: *YW Fung* Signature: Date: 16 July 2018

綜合試驗有限公司
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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0901 01

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	B & K	,	B & K
Type/Model No.:	2238	,	4188
Serial/Equipment No.:	2800927	,	2791211
Adaptors used:	-	,	-

Item submitted by

Customer Name:	AECOM ASIA CO., LTD.
Address of Customer:	-
Request No.:	-
Date of receipt:	01-Sep-2017

Date of test: 09-Sep-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	08-Sep-2018	CIGISMEC
Signal generator	DS 360	33873	25-Apr-2018	CEPREI
Signal generator	DS 360	61227	01-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	50 ± 10 %
Air pressure:	1010 ± 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 ±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 responsess 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: Huang Jian Min/Feng Jun Qi **Date:** 09-Sep-2017 **Company Chop:** SOILS AND MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0901 01

1, Electrical Tests

The electrical tests were perfomed 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	
Frequency weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	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: Lai Sheng Jie Date: 09-Sep-2017

Checked by: Fung Chi Yip Date: 09-Sep-2017

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.

綜合試驗有限公司
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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 18CA0321 01-02 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	B & K	B & K	B & K
Type/Model No.:	2250-L	4950	ZC0032
Serial/Equipment No.:	2681366	2665582	17190
Adaptors used:	- (N 011.01)	-	-

Item submitted by

Customer Name:	AECOM ASIA CO LTD
Address of Customer:	-
Request No.:	-
Date of receipt:	21-Mar-2018

Date of test: 23-Mar-2018

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	08-Sep-2018	CIGISMEC
Signal generator	DS 360	33873	25-Apr-2018	CEPREI
Signal generator	DS 360	61227	01-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	50 ± 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 ±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 responsess 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 Jun Qi **Date:** 24-Mar-2018 **Company Chop:** SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

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.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
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HOKLAS 028
CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 18CA0321 01-02 Page 2 of 2

1, Electrical Tests

The electrical tests were perfomed 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 Uncertanity (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	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Time weightings	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
Peak response	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 Uncertanity (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: Fung Chi Yip Date: 23-Mar-2018

Checked by: Lam Tze Wai Date: 24-Mar-2018

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.

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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 17CA0922 03-02 **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

Curstomer:	AECOM ASIA CO LIMITED
Address of Customer:	-
Request No.:	-
Date of receipt:	22-Sep-2017

Date of test: 28-Sep-2017

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	11-Apr-2018	SCL
Preamplifier	B&K 2673	2743150	05-May-2018	CEPREI
Measuring amplifier	B&K 2610	2346941	03-May-2018	CEPREI
Signal generator	DS 360	61227	01-Apr-2018	CEPREI
Digital multi-meter	34401A	US36087050	25-Apr-2018	CEPREI
Audio analyzer	8903B	GB41300350	21-Apr-2018	CEPREI
Universal counter	53132A	MY40003662	22-Apr-2018	CEPREI

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1000 ± 5 hPa

Test specifications

1, 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.

2, The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.

3, 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: Huang Jian Min/Feng Jun Qi **Date:** 28-Sep-2017 **Company Chop:** SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Comments: The results reported in this certificate refer to the conditon of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.

綜合試驗有限公司
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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 17CA0922 03-02 Page: 2 of 2

1, Measured Sound Pressure Level

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

(Output level in dB re 20 μPa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.07	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

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

At 1000 Hz **STF = 0.011 dB**

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

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

At 1000 Hz **Actual Frequency = 1002.1 Hz**

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

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

At 1000 Hz **TND = 2.8 %**

Estimated expanded uncertainty 0.7 %

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

- End -

Calibrated by: Lai Sheng Jie **Date:** 28-Sep-2017

Checked by: Fung Chi Yip **Date:** 28-Sep-2017

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

APPENDIX E

EM&A Monitoring Schedules

CV/2007/03 - Development at Anderson Road
Impact Air Quality and Noise Monitoring Schedule for August 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1-Aug	2-Aug	3-Aug	4-Aug
			24-hour TSP 1-hour TSP Noise (ID1-5)			
5-Aug	6-Aug	7-Aug	8-Aug	9-Aug	10-Aug	11-Aug
		24-hour TSP 1-hour TSP Noise (ID1-5)				
12-Aug	13-Aug	14-Aug	15-Aug	16-Aug	17-Aug	18-Aug
	24-hour TSP 1-hour TSP Noise (ID1-5)					24-hour TSP 1-hour TSP (ID1-5)
19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug	25-Aug
					24-hour TSP 1-hour TSP Noise (ID1-5)	
26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug	
				24-hour TSP 1-hour TSP Noise (ID1-5)		

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

CV/2007/03 - Development at Anderson Road
Tentative Impact Air Quality and Noise Monitoring Schedule for September 2018

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Sep
2-Sep	3-Sep	4-Sep	5-Sep	6-Sep	7-Sep	8-Sep
			24-hour TSP 1-hour TSP Noise (ID1-5)			
9-Sep	10-Sep	11-Sep	12-Sep	13-Sep	14-Sep	15-Sep
		24-hour TSP 1-hour TSP Noise (ID1-5)				
16-Sep	17-Sep	18-Sep	19-Sep	20-Sep	21-Sep	22-Sep
	24-hour TSP 1-hour TSP Noise (ID1-5)					24-hour TSP 1-hour TSP (ID1-5)
23-Sep	24-Sep	25-Sep	26-Sep	27-Sep	28-Sep	29-Sep
					24-hour TSP 1-hour TSP Noise (ID1-5)	
30-Sep						

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

APPENDIX F

Air Quality Monitoring Results and their Graphical Presentations

Appendix F
Air Quality Monitoring Results

1-hour TSP Monitoring Results at Station ID 1A (Kwun Tong Government Secondary School)

Date	Start Time (hh:mm)	1st Hour Conc. (μg/m^3)	2nd Hour Conc. (μg/m^3)	3rd Hour Conc. (μg/m^3)
1-Aug-18	10:40	67.2	67.8	64.2
7-Aug-18	11:20	65.8	67.9	68.1
13-Aug-18	10:24	68.2	71.3	71.2
18-Aug-18	10:22	68.8	67.4	69.4
24-Aug-18	10:50	68.9	68.2	68.5
30-Aug-18	9:30	65.3	64.8	65.0
			Average	67.7
			Min	64.2
			Max	71.3

1-hour TSP Monitoring Results at Station ID 2 (On Yat House)

Date	Start Time (hh:mm)	1st Hour Conc. (μg/m^3)	2nd Hour Conc. (μg/m^3)	3rd Hour Conc. (μg/m^3)
1-Aug-18	10:53	69.7	72.2	70.6
7-Aug-18	10:59	69.6	70.5	67.3
13-Aug-18	10:40	65.6	67.6	67.5
18-Aug-18	10:40	66.5	70.1	68.1
24-Aug-18	10:20	69.3	68.9	69.3
30-Aug-18	9:50	65.1	64.8	65.3
			Average	68.2
			Min	64.8
			Max	72.2

1-hour TSP Monitoring Results at Station ID 3 (Sau Nga House)

Date	Start Time (hh:mm)	1st Hour Conc. (μg/m^3)	2nd Hour Conc. (μg/m^3)	3rd Hour Conc. (μg/m^3)
1-Aug-18	11:07	69.1	71.8	65.5
7-Aug-18	10:44	71.7	66.2	68.4
13-Aug-18	10:52	70.3	71.1	68.8
18-Aug-18	10:55	68.7	66.3	70.3
24-Aug-18	10:00	70.4	71.8	71.0
30-Aug-18	10:15	65.7	66.2	66.0
			Average	68.9
			Min	65.5
			Max	71.8

1-hour TSP Monitoring Results at Station ID 4 (Sau Ming Primary School)

Date	Start Time (hh:mm)	1st Hour Conc. (μg/m^3)	2nd Hour Conc. (μg/m^3)	3rd Hour Conc. (μg/m^3)
1-Aug-18	11:25	68.4	69.6	71.1
7-Aug-18	10:30	72.9	69.7	66.9
13-Aug-18	11:05	71.6	72.0	72.5
18-Aug-18	11:12	68.8	67.0	64.2
24-Aug-18	9:45	70.5	71.0	71.2
30-Aug-18	10:36	66.0	67.2	64.9
			Average	69.2
			Min	64.2
			Max	72.9

1-hour TSP Monitoring Results at Station ID 5 (Sau Mau Ping Catholic Primary School)

Date	Start Time (hh:mm)	1st Hour Conc. (μg/m^3)	2nd Hour Conc. (μg/m^3)	3rd Hour Conc. (μg/m^3)
1-Aug-18	11:45	68.5	70.0	66.3
7-Aug-18	10:12	71.4	68.7	70.2
13-Aug-18	11:30	67.3	69.7	70.9
18-Aug-18	11:30	64.9	65.7	67.3
24-Aug-18	9:30	71.0	72.1	72.3
30-Aug-18	11:00	62.4	61.9	62.0
			Average	67.9
			Min	61.9
			Max	72.3

Appendix F
Air Quality Monitoring Results

24-hour TSP Monitoring Results at Station ID 1A (Kwun Tong Government Secondary School)

Date	Weather Condition	Air Temp. (°C)	Atmospheric Pressure(hPa)	Flow Rate (m^3/min.) Initial	Flow Rate (m^3/min.) Final	Av. flow (m^3/min)	Total vol. (m^3)	Filter Weight (g) Initial	Filter Weight (g) Final	Particulate weight(g)	Elapse Time Initial	Elapse Time Final	Sampling Time(hrs.)	Conc. (μg/m^3)
1-Aug-18	Fine	30.2	1006.1	1.3277	1.3261	1.33	1910.7	2.6361	2.6620	0.0259	21228.39	21252.39	24.00	13.6
7-Aug-18	Sunny	33.8	1005.4	1.3312	1.3338	1.33	1918.8	2.6437	2.6760	0.0323	21252.39	21276.39	24.00	16.8
13-Aug-18	Sunny	32.6	996.3	1.2891	1.2912	1.29	1857.8	2.6095	2.6350	0.0255	21276.39	21300.39	24.00	13.7
18-Aug-18	Rainy	28.3	1002.5	1.3305	1.3324	1.33	1917.3	2.6735	2.6937	0.0202	21300.39	21324.39	24.00	10.5
24-Aug-18	Sunny	31.9	1001.6	1.3365	1.3249	1.33	1916.2	2.6588	2.7419	0.0831	21324.39	21348.39	24.00	43.4
30-Aug-18	Rainly	28.9	1002.5	1.3376	1.3367	1.34	1925.5	2.6360	2.7373	0.1013	21348.39	21372.39	24.00	52.6
													Average	25.1
													Min	10.5
													Max	52.6

24-hour TSP Monitoring Results at Station ID 2 (On Yat House)

Date	Weather Condition	Air Temp. (°C)	Atmospheric Pressure(hPa)	Flow Rate (m^3/min.) Initial	Flow Rate (m^3/min.) Final	Av. flow (m^3/min)	Total vol. (m^3)	Filter Weight (g) Initial	Filter Weight (g) Final	Particulate weight(g)	Elapse Time Initial	Elapse Time Final	Sampling Time(hrs.)	Conc. (μg/m^3)
1-Aug-18	Fine	30.2	1006.1	1.3195	1.3211	1.32	1901.2	2.6652	2.7034	0.0382	23497.12	23521.12	24.00	20.1
7-Aug-18	Sunny	33.8	1005.4	1.3246	1.3274	1.33	1909.4	2.6272	2.6660	0.0388	23521.12	23545.12	24.00	20.3
13-Aug-18	Sunny	32.6	996.3	1.2796	1.2817	1.28	1844.1	2.6187	2.6599	0.0412	23545.12	23569.12	24.00	22.3
18-Aug-18	Rainy	28.3	1002.5	1.3239	1.3260	1.32	1907.9	2.6063	2.6385	0.0322	23569.12	23593.12	24.00	16.9
24-Aug-18	Sunny	31.9	1001.6	1.3302	1.3182	1.32	1906.8	2.6159	2.7084	0.0925	23593.12	23617.12	24.00	48.5
30-Aug-18	Rainly	28.9	1002.5	1.3313	1.3304	1.33	1916.4	2.6478	2.7924	0.1446	23617.12	23641.12	24.00	75.5
													Average	33.9
													Min	16.9
													Max	75.5

24-hour TSP Monitoring Results at Station ID 3 (Sau Nga House)

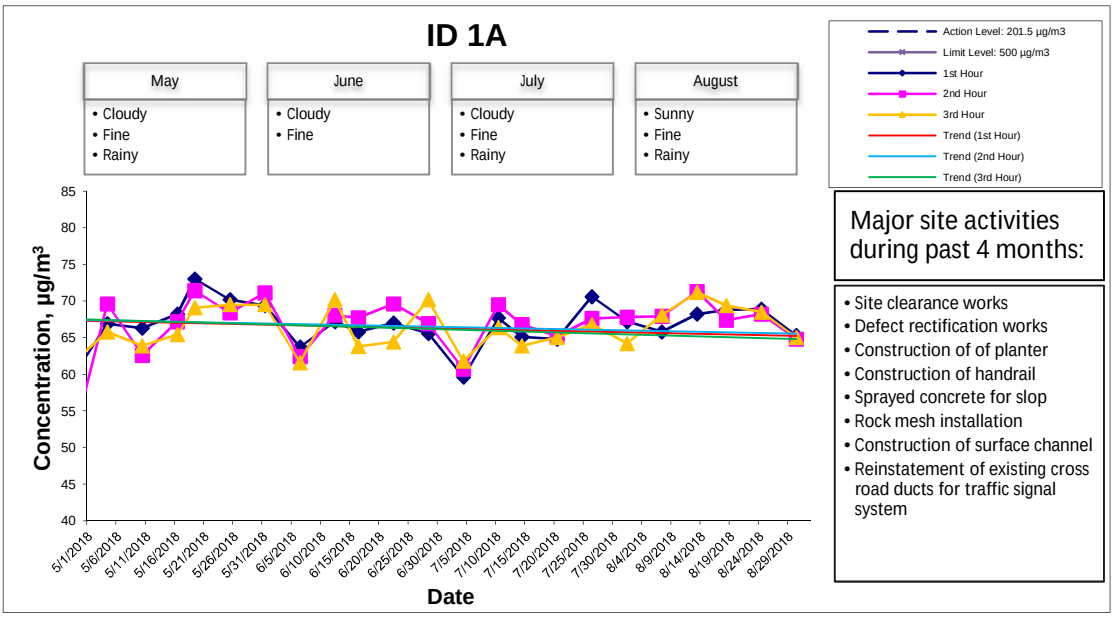
Date	Weather Condition	Air Temp. (°C)	Atmospheric Pressure(hPa)	Flow Rate (m^3/min.) Initial	Flow Rate (m^3/min.) Final	Av. flow (m^3/min)	Total vol. (m^3)	Filter Weight (g) Initial	Filter Weight (g) Final	Particulate weight(g)	Elapse Time Initial	Elapse Time Final	Sampling Time(hrs.)	Conc. (μg/m^3)
1-Aug-18	Fine	29.7	1002.5	1.3260	1.3277	1.33	1910.7	2.6335	2.6649	0.0314	25811.01	25835.01	24.00	16.4
7-Aug-18	Sunny	33.8	1005.4	1.3311	1.3339	1.33	1918.8	2.6329	2.6827	0.0498	25835.01	25859.01	24.00	26.0
13-Aug-18	Sunny	32.6	996.3	1.2898	1.2919	1.29	1858.8	2.6086	2.6375	0.0289	25859.01	25883.01	24.00	15.5
18-Aug-18	Rainy	28.3	1002.5	1.3304	1.3325	1.33	1917.3	2.6323	2.6528	0.0205	25883.01	25907.01	24.00	10.7
24-Aug-18	Sunny	31.9	1001.6	1.3366	1.3248	1.33	1916.2	2.6346	2.7177	0.0831	25907.01	25931.01	24.00	43.4
30-Aug-18	Rainly	28.9	1002.5	1.3377	1.3368	1.34	1925.6	2.6492	2.8218	0.1726	25931.01	25955.01	24.00	89.6
													Average	33.6
													Min	10.7
													Max	89.6

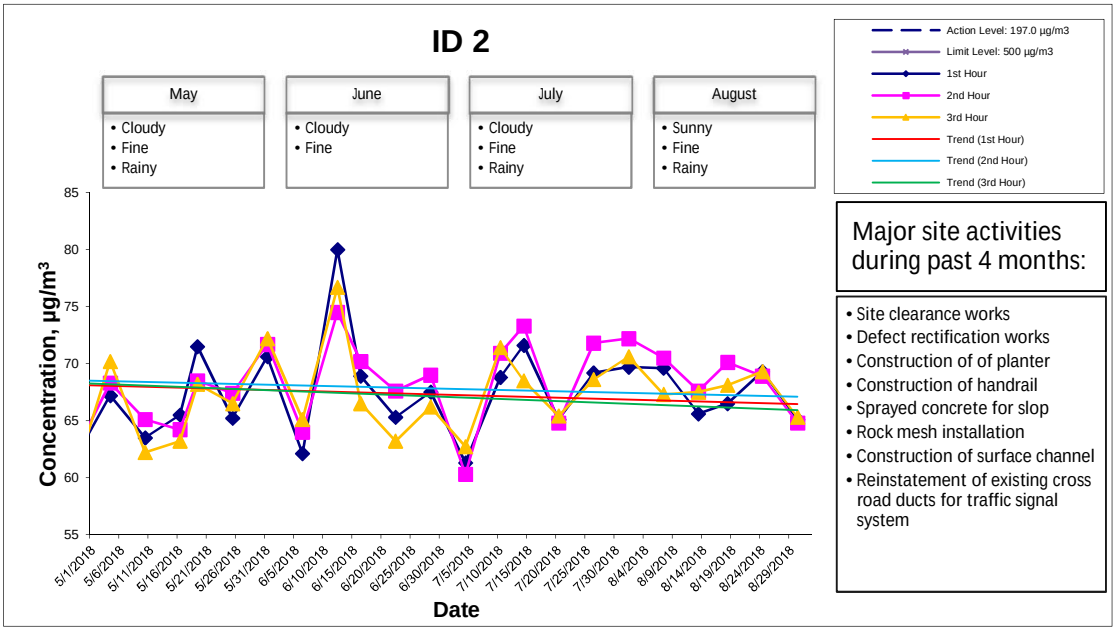
24-hour TSP Monitoring Results at Station ID 4 (Sau Ming Primary School)

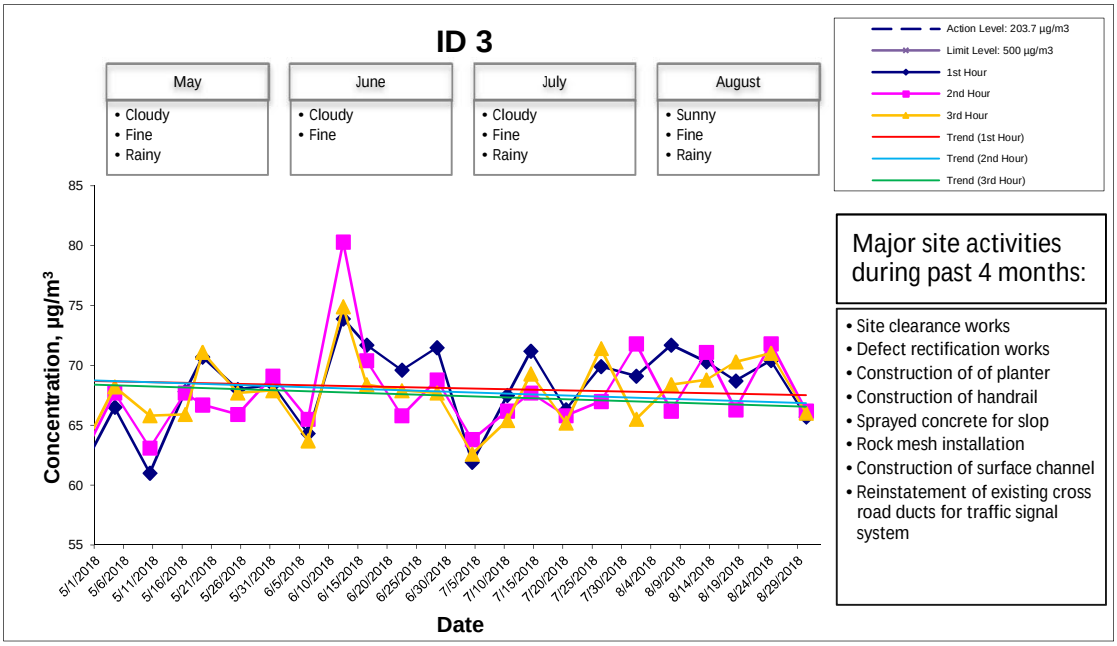
Date	Weather Condition	Air Temp. (°C)	Atmospheric Pressure(hPa)	Flow Rate (m^3/min.) Initial	Flow Rate (m^3/min.) Final	Av. flow (m^3/min)	Total vol. (m^3)	Filter Weight (g) Initial	Filter Weight (g) Final	Particulate weight(g)	Elapse Time Initial	Elapse Time Final	Sampling Time(hrs.)	Conc. (μg/m^3)
1-Aug-18	Fine	29.7	1002.5	1.3281	1.3299	1.33	1913.8	2.6397	2.6844	0.0447	26511.01	26535.01	24.00	23.4
7-Aug-18	Sunny	33.8	1005.4	1.3338	1.3369	1.34	1922.9	2.5997	2.6407	0.0410	26535.01	26559.01	24.00	21.3
13-Aug-18	Sunny	32.6	996.3	1.2867	1.2891	1.29	1854.6	2.6320	2.6686	0.0366	26659.01	26683.01	24.00	19.7
18-Aug-18	Rainy	28.3	1002.5	1.3330	1.3353	1.33	1921.2	2.6272	2.6614	0.0342	26683.01	26707.01	24.00	17.8
24-Aug-18	Sunny	31.9	1001.6	1.3400	1.3267	1.33	1920.0	2.6466	2.7312	0.0846	26707.01	26731.01	24.00	44.1
30-Aug-18	Rainly	28.9	1002.5	1.3413	1.3402	1.34	1930.7	2.6575	2.8094	0.1519	26731.01	26755.01	24.00	78.7
													Average	34.2
													Min	17.8
													Max	78.7

24-hour TSP Monitoring Results at Station ID 5 (Sau Mau Ping Catholic Primary School)

Date	Weather Condition	Air Temp. (°C)	Atmospheric Pressure(hPa)	Flow Rate (m^3/min.) Initial	Flow Rate (m^3/min.) Final	Av. flow (m^3/min)	Total vol. (m^3)	Filter Weight (g) Initial	Filter Weight (g) Final	Particulate weight(g)	Elapse Time Initial	Elapse Time Final	Sampling Time(hrs.)	Conc. (μg/m^3)
1-Aug-18	Fine	29.7	1002.5	1.3281	1.3299	1.33	1913.8	2.6574	2.6966	0.0392	23302.57	23326.57	24.00	20.5
7-Aug-18	Sunny	33.8	1005.4	1.3337	1.3366	1.34	1922.6	2.6298	2.6840	0.0542	23326.57	23350.57	24.00	28.2
13-Aug-18	Sunny	32.6	996.3	1.2830	1.2853	1.28	1849.2	2.6426	2.6755	0.0329	23350.57	23374.57	24.00	17.8
18-Aug-18	Rainy	28.3	1002.5	1.3329	1.3351	1.33	1921.0	2.6378	2.6627	0.0249	23374.57	23398.57	24.00	13.0
24-Aug-18	Sunny	31.9	1001.6	1.3397	1.3267	1.33	1919.8	2.6729	2.7297	0.0568	23398.57	23422.57	24.00	29.6
30-Aug-18	Rainly	28.9	1002.5	1.3409	1.3398	1.34	1930.1	2.6499	2.6663	0.0164	23422.57	23446.57	24.00	8.5
													Average	19.6
													Min	8.5
													Max	29.6







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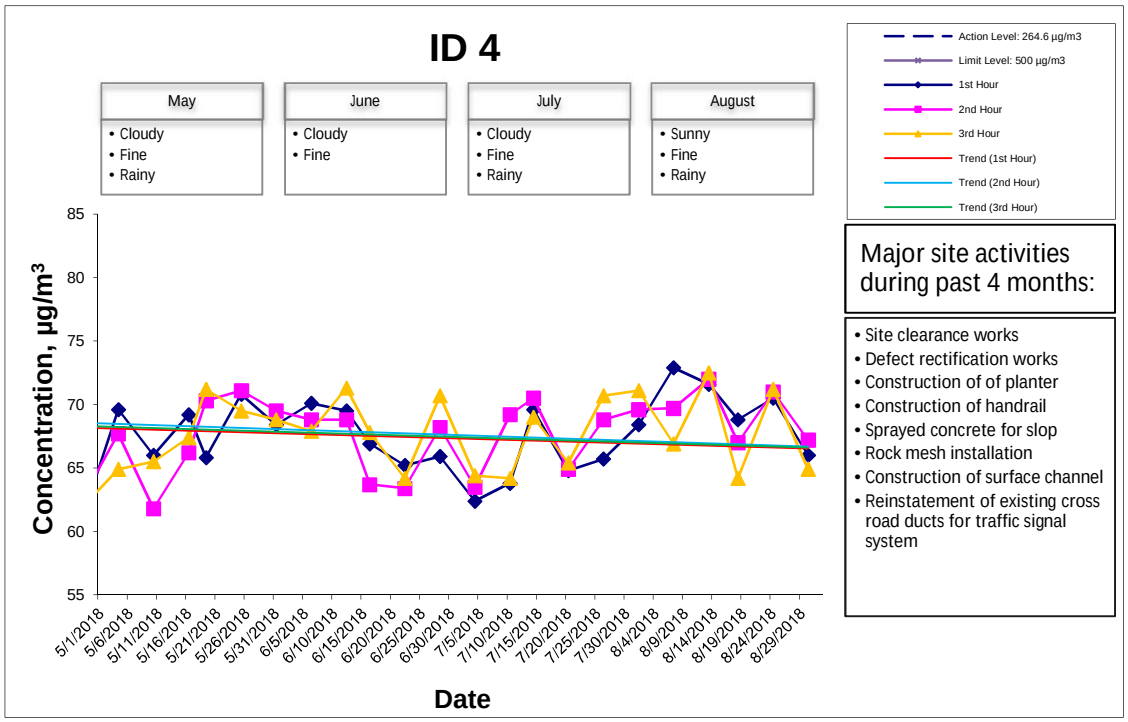
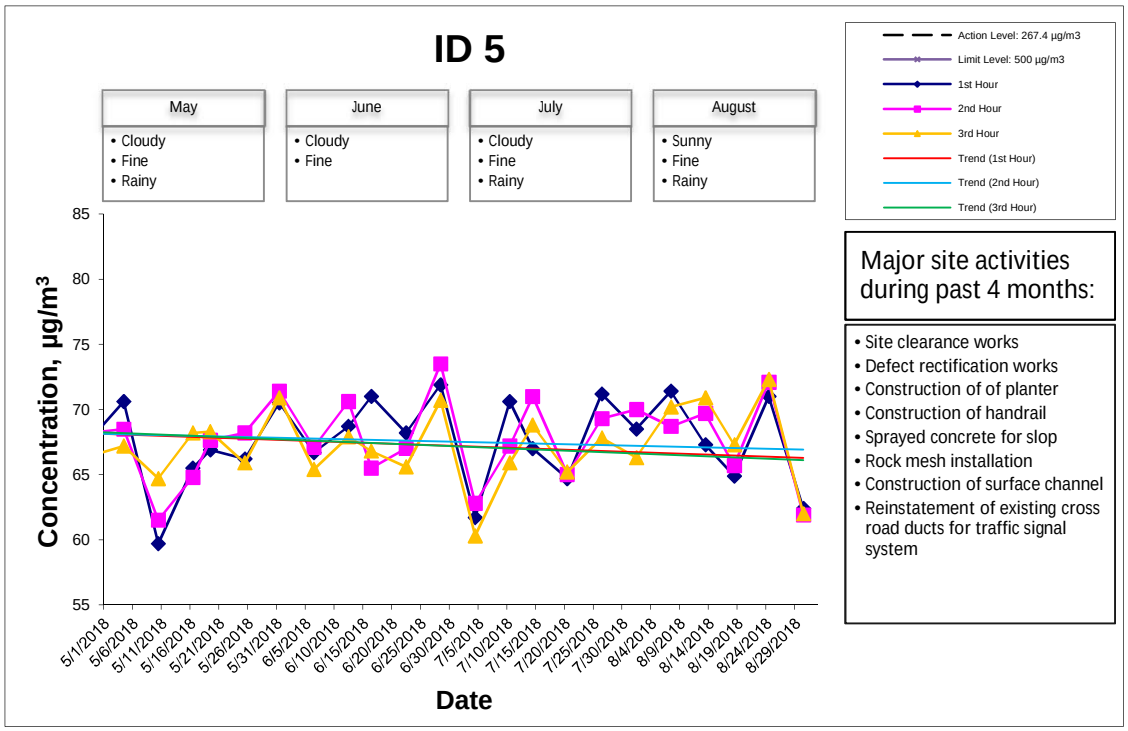
		CHECK	FYW	DRAWN	DTTW
	Graphical Presentations of Impact 1-hour TSP Monitoring Results	JOB NO.	60043155	**APPENDIX No.** F	**Rev.** -





AECOM	**Development at Anderson Road - Site Formation and Associated Infrastructure Works**	SCALE	N.T.S.	DATE	Sep-18
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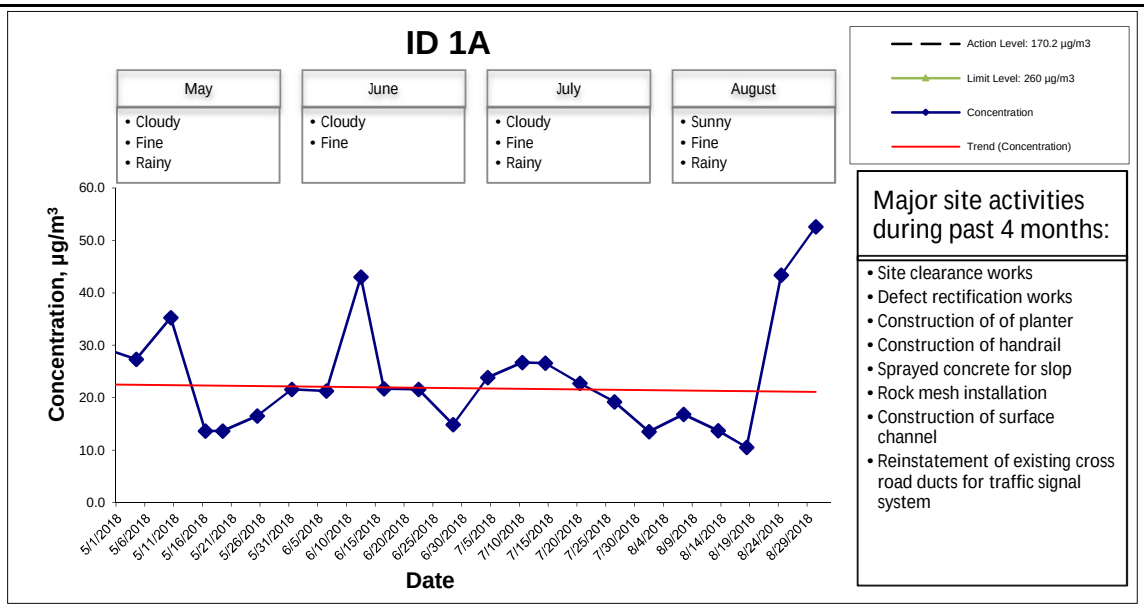
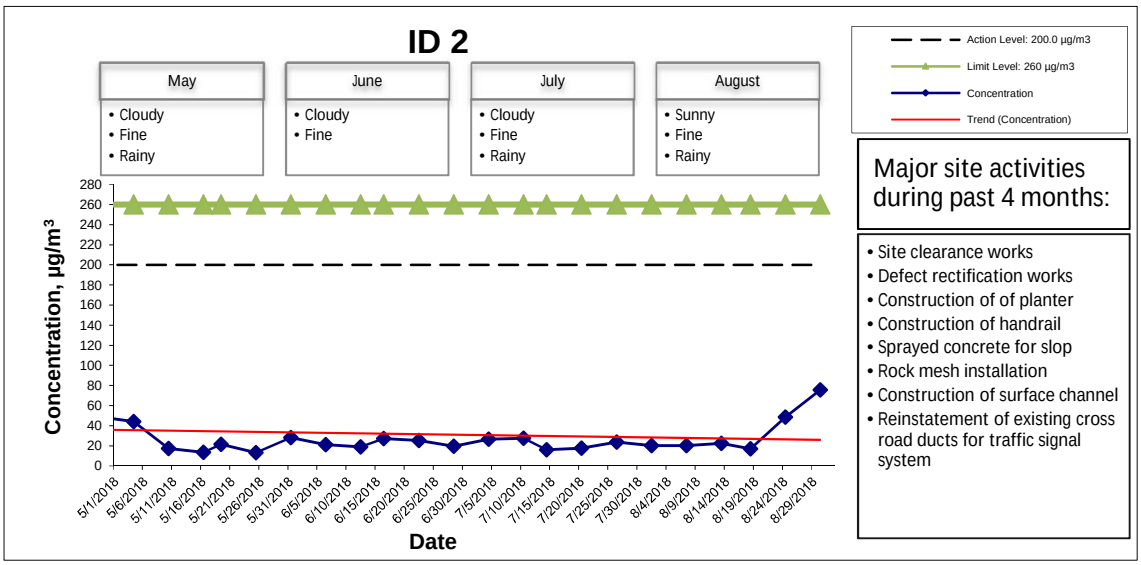
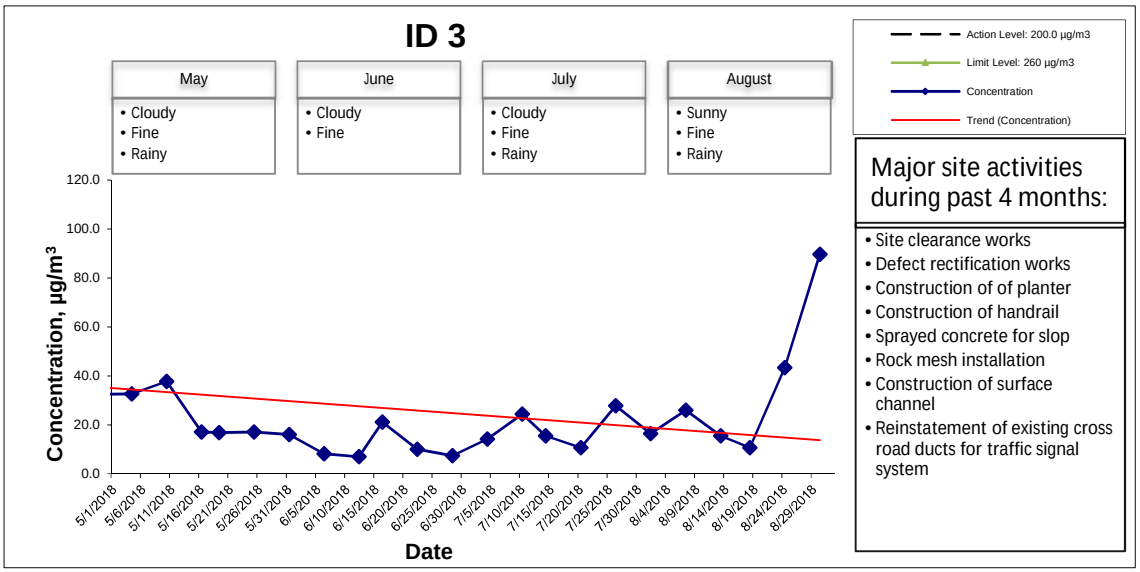
	Graphical Presentations of Impact 1-hour TSP Monitoring Results	JOB NO.	60043155	**APPENDIX No.** F	**Rev.** -







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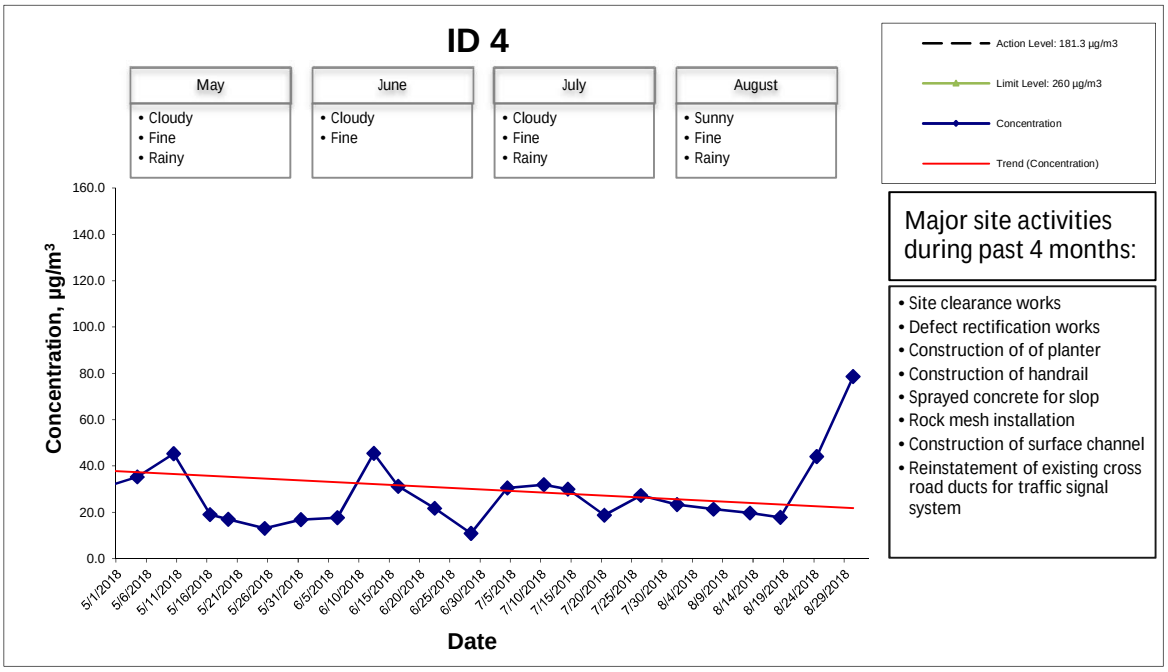
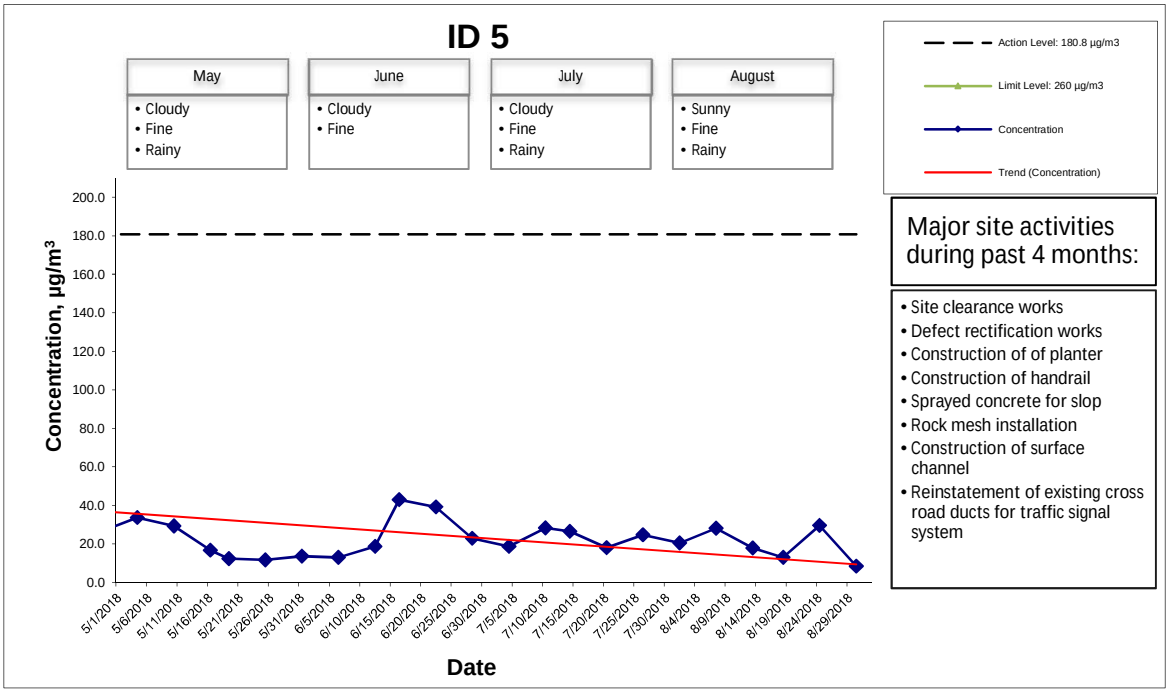




AECOM	**Development at Anderson Road - Site Formation and Associated Infrastructure Works** **Graphical Presentations of Impact 24-hour TSP Monitoring Results**	SCALE	N.T.S.	DATE	Sep-18
		CHECK	FYW	DRAWN	DTTW
		JOB NO.	60043155	**APPENDIX No.** F	**Rev.** -

APPENDIX G

Noise Monitoring Results and their Graphical Presentations

Appendix G Noise Monitoring Results

Daytime Noise Monitoring Results at Station ID 1A (Kwun Tong Government Secondary School)

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				
1-Aug-18	Sunny	10:40	60.6	64.2	62.7	61.0	57.8	70	N
7-Aug-18	Sunny	11:25	60.7	63.9	62.2	60.2	57.8	70	N
13-Aug-18	Fine	10:25	60.4	63.9	62.2	60.2	57.8	70	N
24-Aug-18	Sunny	10:50	60.4	63.4	62.3	60.4	57.8	70	N
30-Aug-18	Cloudy	16:10	61.9	63.7	62.3	60.4	57.8	70	N
		Min	60.4	63.4		60.2			
		Max	61.9	64.2		61.0			
		Average	--	--		60.5			

Daytime Noise Monitoring Results at Station ID 2 (On Yat House)

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				
1-Aug-18	Sunny	13:10	60.9	65.2	63.5	58.2	62.0	75	N
7-Aug-18	Sunny	13:18	61.2	65.2	63.5	58.2	62.0	75	N
13-Aug-18	Fine	13:40	61.1	65.0	63.3	57.4	62.0	75	N
24-Aug-18	Sunny	11:30	60.5	62.9	61.8	61.8	62.0	75	N
30-Aug-18	Cloudy	15:28	61.4	64.0	62.5	52.9	62.0	75	N
		Min	60.5	62.9		52.9			
		Max	61.4	65.2		61.8			
		Average	--	--		58.5			

Daytime Noise Monitoring Results at Station ID 3 (Sau Nga House)

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				
1-Aug-18	Sunny	14:02	62.7	66.9	65.1	58.2	64.1	75	N
7-Aug-18	Sunny	14:05	62.3	66.8	65.1	58.2	64.1	75	N
13-Aug-18	Fine	14:30	62.1	67.0	65.2	58.7	64.1	75	N
24-Aug-18	Sunny	13:30	63.6	66.1	65.2	58.7	64.1	75	N
30-Aug-18	Cloudy	14:42	63.7	66.9	65.8	60.9	64.1	75	N
		Min	62.1	66.1		58.2			
		Max	63.7	67.0		60.9			
		Average	--	--		59.1			

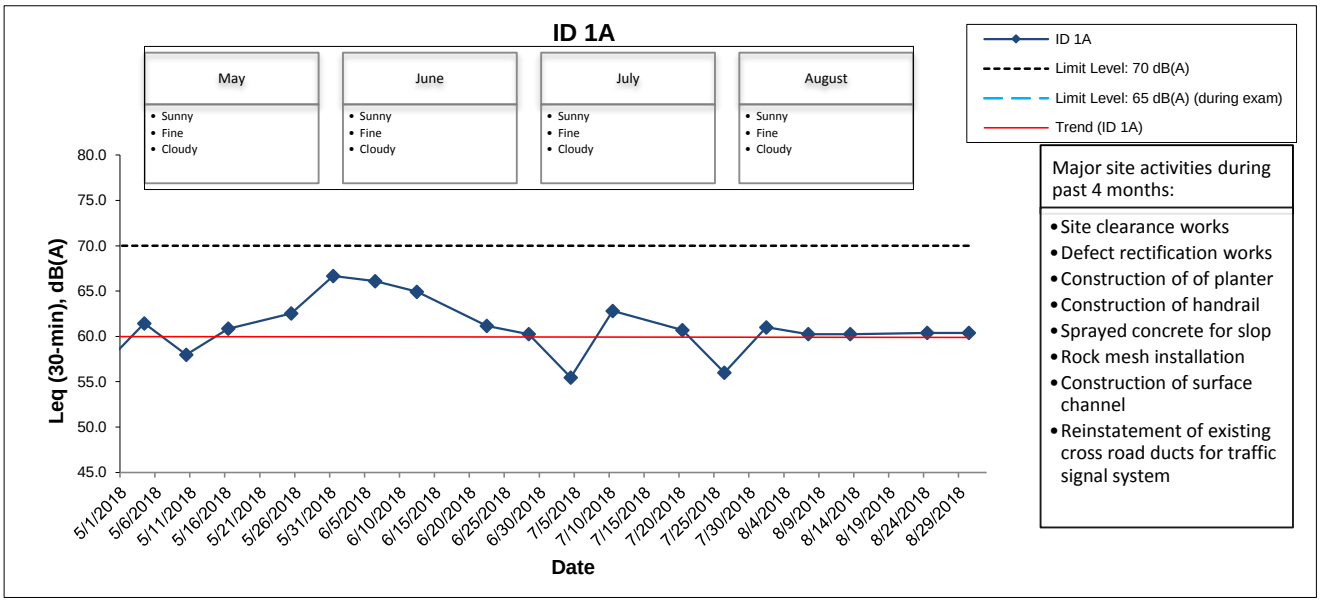
Daytime Noise Monitoring Results at Station ID 4 (Sau Ming Primary School)

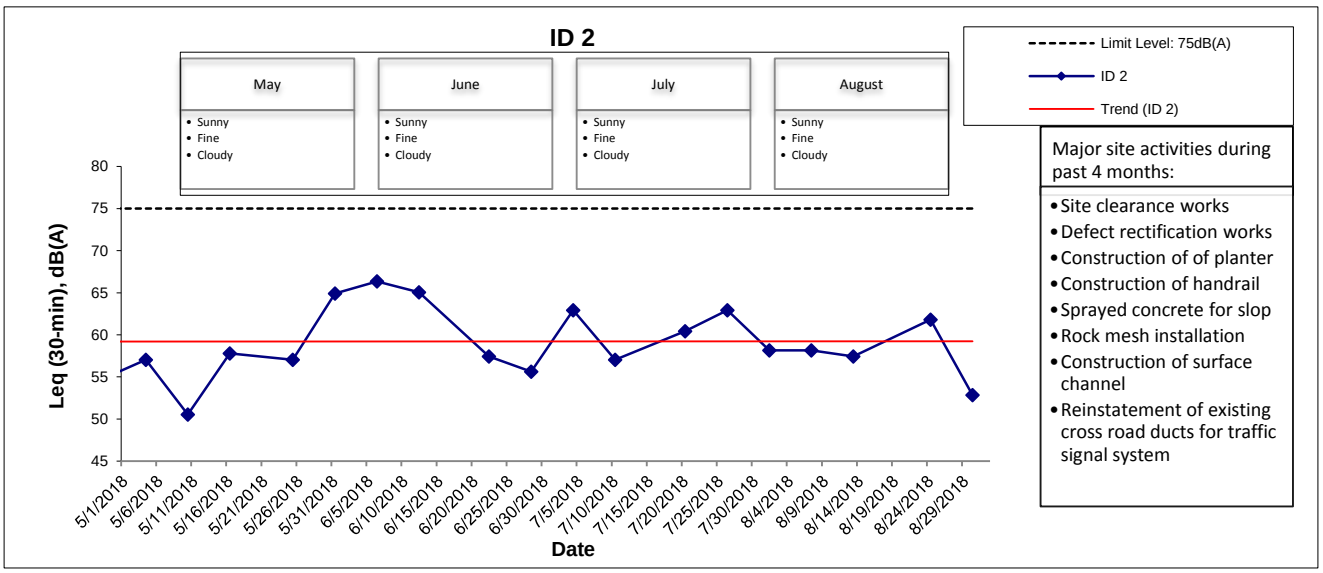
Date	Weather Condition	Noise Level for 30-min, dB(A)+				Baseline Corrected Level, dB(A)	Baseline Noise Level, dB(A)	Limit Level**, dB(A)	Exceedance (Y/N)
		Time	L90	L10	Leq				
1-Aug-18	Sunny	14:50	62.7	66.9	65.1	65.1	65.7	70	N
7-Aug-18	Sunny	15:00	63.3	68.5	66.8	60.3	65.7	70	N
13-Aug-18	Fine	15:20	63.5	68.4	66.8	60.3	65.7	70	N
24-Aug-18	Sunny	14:25	64.0	67.8	66.3	57.4	65.7	70	N
30-Aug-18	Cloudy	14:00	64.2	67.6	66.0	54.2	65.7	70	N
		Min	62.7	66.9		54.2			
		Max	64.2	68.5		65.1			
		Average	--	--		60.9			

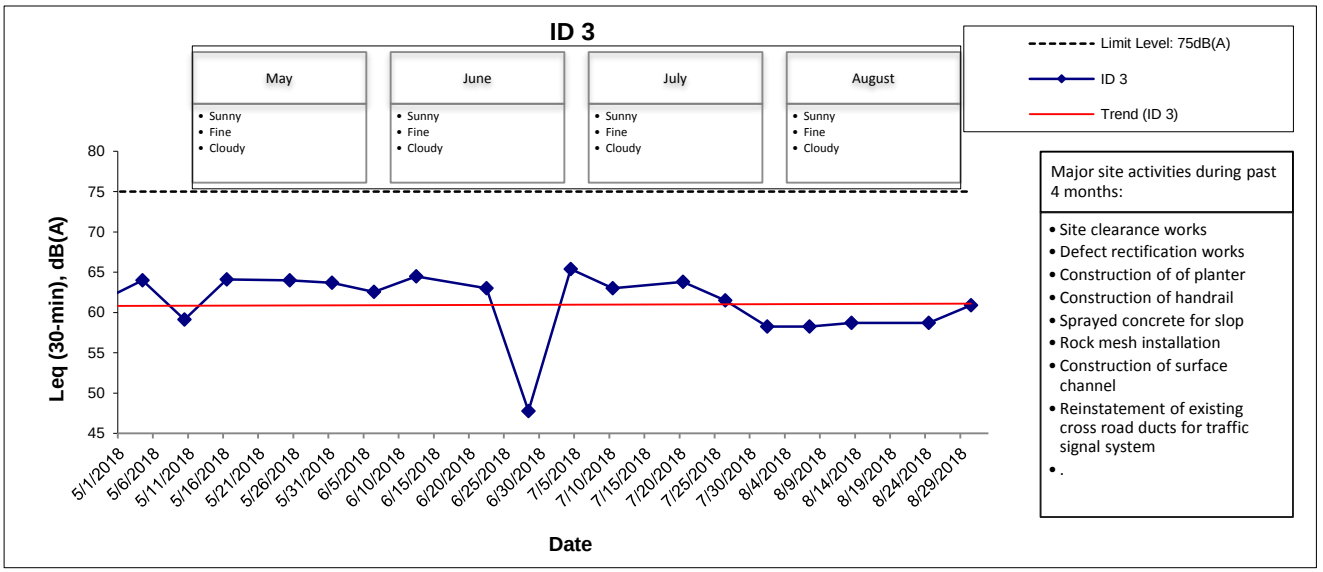
Daytime Noise Monitoring Results at Station ID 5 (Sau Mau Ping Catholic Primary School)

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				
1-Aug-18	Sunny	15:40	63.9	68.6	66.7	62.4	64.7	70	N
7-Aug-18	Sunny	15:50	63.5	67.6	65.7	58.8	64.7	70	N
13-Aug-18	Fine	11:26	64.7	68.5	67.1	63.4	64.7	70	N
24-Aug-18	Sunny	15:10	62.8	65.9	64.2	64.2	64.7	70	N
30-Aug-18	Cloudy	11:00	63.8	66.5	65.0	53.2	64.7	70	N
		Min	62.8	65.9		53.2			
		Max	64.7	68.6		64.2			
		Average	--	--		61.8			

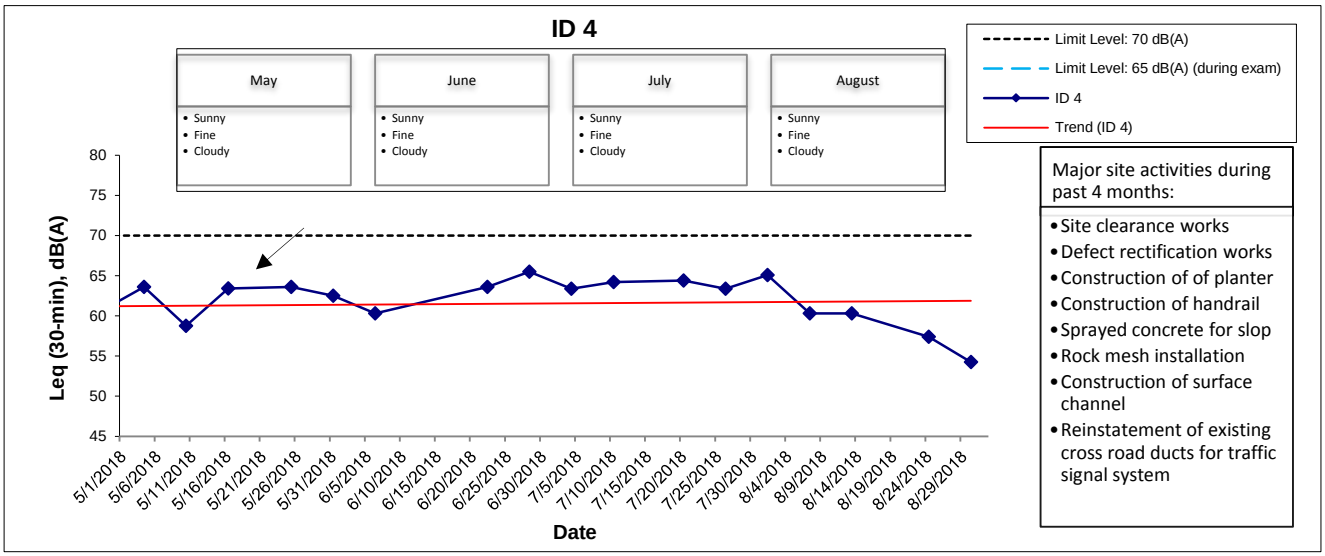
+ - Façade measurement
** - Limit Level of 70dB(A) applies to education institutes while 65dB(A) applies during school examination period.

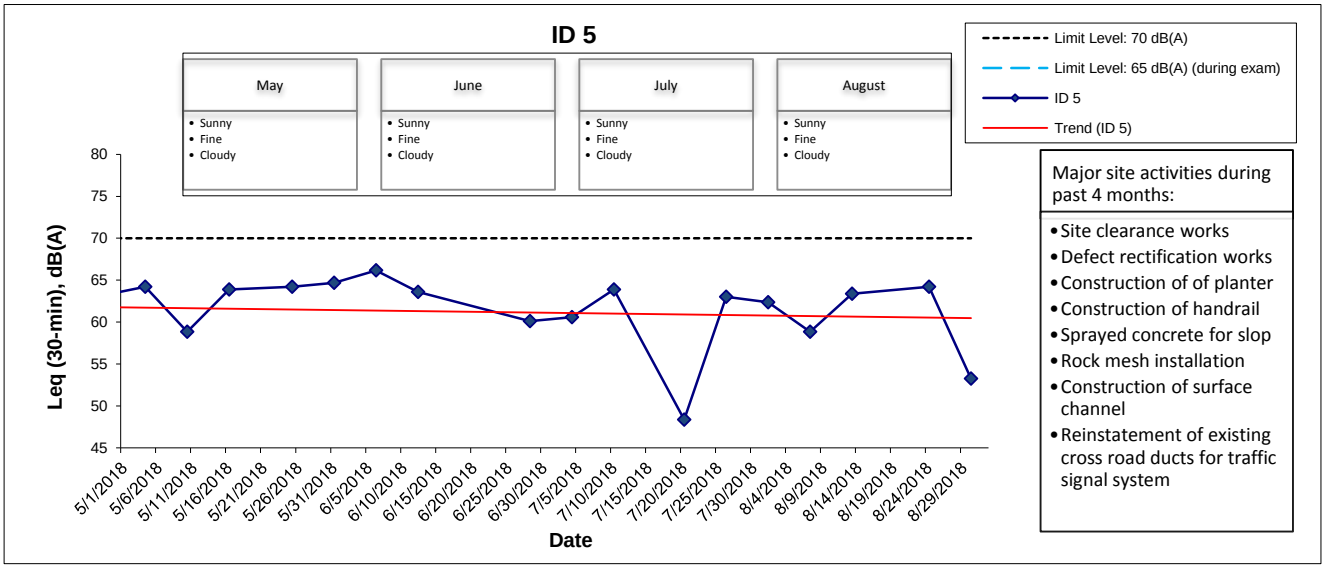






AECOM	**Development at Anderson Road - Site Formation and Associated Infrastructure Works**	SCALE	N.T.S.	DATE	Sep-18
		CHECK	FYW	DRAWN	DTTW
	Graphical Presentations of Noise Monitoring Results	JOB NO.	60043155	**APPENDIX** G	**Rev** -





AECOM	**Development at Anderson Road - Site Formation and Associated Infrastructure Works**	SCALE	N.T.S.	DATE	Sep-18
		CHECK	FYW	DRAWN	DTTW
	Graphical Presentations of Noise Monitoring Results	JOB NO.	60043155	**APPENDIX** G	**Rev** -

APPENDIX H

Meteorological Data for the Reporting Month

Home
What's new
About us
HKO Side Lights
Our Services
Visitors Figures
Press releases
Weather Note (Chinese)
Today's Weather Warnings
Local Weather Observations
Weather Forecast
Weather Monitoring Imagery
Computer Forecast Products
MyObservatory
Met on Map
Tropical Cyclones
Aviation Weather Services
Marine Meteorological Services
Weather Information for Sports
Weather Information for Communities
China Weather
World Weather
Climatological Information Services
> Climate Watch
> Climate Statistics
> Climate Prediction
> Climate Knowledge
> Need More Information?
> Global Climate Services
> Other Useful Links
Climate Forecast
Climate Change
El Nino and La Nina
Earthquakes and Tsunamis
Astronomy, Space Weather and Geomagnetism
Time and Calendar
Radiation Monitoring, Assessment and Protection
Educational Resources
Publications

Back

Daily Extract of Meteorological Observations , August 2018

Year 2018 ▼ Month 8 ▼ Go

Day	Hong Kong Observatory							
	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Mean Amount of Cloud (%)	Total Rainfall (mm)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)				
01	1004.6	32.4	29.9	27.9	25.7	78	76	2.7
02	1003.8	32.9	30.0	26.6	25.6	78	79	6.1
03	1003.4	31.8	30.1	29.1	25.6	77	86	Trace
04	1004.7	32.5	29.8	27.3	25.7	79	80	5.0
05	1005.9	33.1	30.3	28.9	25.8	77	84	0.5
06	1005.4	33.8	30.2	28.8	25.5	76	84	0.0
07	1004.4	34.2	30.0	28.4	25.6	78	78	0.0
08	1004.2	33.9	30.3	27.1	25.4	75	72	0.5
09	1003.3	33.6	30.4	29.2	25.1	74	79	Trace
10	1001.7	29.5	27.2	26.0	25.9	92	91	47.9
11	998.7	28.2	27.0	25.8	25.9	93	90	51.9
12	996.5	28.1	26.9	25.8	25.7	93	90	18.9
13	996.3	32.6	28.9	27.3	25.8	84	80	0.1
14	996.2	29.9	27.6	26.4	25.9	90	89	32.9
15	999.2	30.9	28.2	26.4	25.6	86	88	2.2
16	1000.1	29.0	27.8	26.7	25.9	89	88	3.2
17	1000.2	28.3	27.2	25.5	25.5	91	89	36.1
18	1001.4	30.9	28.4	25.9	25.3	84	88	21.8
19	1002.5	30.4	28.6	26.4	25.6	84	89	31.2
20	1002.3	30.5	27.8	26.1	25.7	88	91	61.1
21	1000.2	30.2	28.3	26.7	25.6	86	83	25.7
22	1000.1	31.8	28.5	24.7	25.2	83	71	26.4
23	1001.7	30.9	27.7	24.6	25.2	86	86	24.9
24	1001.6	31.9	29.1	25.6	25.6	82	83	0.1
25	999.8	32.9	30.3	27.8	24.8	73	66	0.0
26	999.5	31.4	28.9	25.5	24.4	77	86	80.2
27	1001.3	29.9	27.0	25.2	24.5	87	89	27.3
28	1002.2	29.2	26.3	25.2	24.9	93	93	71.6
29	1002.5	29.3	27.4	26.1	25.5	89	89	23.3
30	1005.5	28.9	28.0	26.9	25.6	87	90	6.3
31	1009.3	29.0	27.9	27.0	25.6	88	89	7.2
Mean/Total	1001.9	31.0	28.6	26.7	25.5	84	84	615.1
Normal§	1005.2	31.1	28.6	26.6	25.0	81	69	432.2

Trace means rainfall less than 0.05 mm

§ 1981-2010 Climatological Normal

Last revision date: <17 Jun 2016>

Media and Information Services
Audio/Video Webpage
Electronic services
World Meteorological Organization-Official City Weather Forecasts
World Meteorological Day
World Meteorological Organization-Global
Severe Weather
Public forms
Contact & Support
Access to information
Tender notices
Links
Important notices
Personalized Website
Mobile Version
RSS Feeds
Text Only Version
Back

APPENDIX I

Event Action Plan

Appendix I – Event Action Plan

Event and Action Plan for Air Quality

Event	ACTION			
	ET	**IC(E)**	**ER**	**Contractor**
ACTION LEVEL				
Exceedance for one sample	1. Identify source 2. Inform IC(E) and ER. 3. Repeat measurement to confirm finding. 4. Increase monitoring frequency to daily	1. Check monitoring data submitted by ET. 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice. 2. Amend working methods if appropriate.
Exceedance for two or more consecutive samples	1. Identify source. 2. Inform IC(E) and ER. 3. Repeat measurements to confirm findings. 4. Increase monitoring frequency to daily. 5. Discuss with IC(E) and Contractor for remedial actions required. 6. If exceedance continues, arrange meeting with IC(E) and ER. 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET. 2. Check Contractor's working method. 3. Discuss with ET and Contractor on possible remedial measures. 4. Advise ER on the effectiveness of proposed remedial measures. 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Ensure remedial actions properly implemented.	1. Submit proposal for remedial actions to IC(E) within 3 working days of notification. 2. Implement the agreed proposals. 3. Amend proposal if appropriate.

Event and Action Plan for Air Quality

Event	ACTION			
	ET	**IC(E)**	**ER**	**Contractor**
LIMIT LEVEL				
Exceedance for one sample	1. Identify source. 2. Inform ER and EPD. 3. Repeat measurement to confirm finding. 4. Increase monitoring frequency to daily. 5. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results.	1. Check monitoring data submitted by ET. 2. Check Contractor's working method. 3. Discuss with ET and Contractor on possible remedial measures. 4. Advise ER on the effectiveness of proposed remedial measures. 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Ensure remedial actions properly implemented.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IC(E) within 3 working days of notification. 3. Implement the agreed proposals 4. Amend proposal if appropriate.
Exceedance for two or more consecutive samples	1. Identify source. 2. Inform ER and EPD. 3. Repeat measurements to confirm finding. 4. Increase monitoring frequency to daily. 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to by implemented. 6. Arrange meeting with IC(E) and ER to discuss the remedial actions to be taken. 7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results. 8. If exceedance stops, cease additional monitoring.	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 ER accordingly. 3. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. In consultation with IC(E), agree with 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 Contractor to stop the portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IC(E) within 3 working days of notification. 3. Implement the agreed proposals. 4. Amend proposal if appropriate.

Event and Action Plan for Noise

Event	Action			
	ET	**IC(E)**	**ER**	**Contractor**
1.Exceedance for Action Level	1. Notify IC(E) and Contractor. 2. Carry out investigation. 3. Report the results of investigation to IC(E) and Contractor. 4. Discuss with Contractor and formulate remedial measures. 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by ET. 2. Review the proposed remedial measures by the Contractor and advise ER accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IC(E). 2. Implement noise mitigation proposals.
1.Exceedance for Limit Level	1. Notify IC(E), ER, EPD and Contractor. 2. Identify sources. 3. Repeat measurements to confirm finding. 4. Increase monitoring frequency. 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. 6. Inform IC(E), ER and EPD the causes and actions taken for the exceedance. 7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results. 8. If exceedance stops, cease additional monitoring.	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 ER accordingly. 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented 5. If exceedance continues, consider what portion of the work is responsible and instruct Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to IC(E) 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 ER until the exceedance is abated.

APPENDIX J

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

Appendix J - Cumulative Statistics on Exceedances, Complaints, Notification of Summons and Successful Prosecutions

Cumulative statistics on Exceedances

		Total no. recorded in this month	Total no. recorded since project commencement
1-Hour TSP	Action	-	-
	Limit	-	-
24-Hour TSP	Action	-	17
	Limit	-	1
Noise	Action	-	32
	Limit	-	1

Cumulative statistics on Complaints, Notifications of Summons and Successful Prosecutions

	Date Received	Subject	Status	Total no. recorded in this month	Total no. recorded since project commencement
Environmental complaints	-	-	-	-	75
Notification of summons	-	-	-	-	6
Successful Prosecutions	-	-	-	-	2