CONTRACT NO: HY/2019/14

NEW WANG TONG RIVER BRIDGE

UNDER ENVIRONMENTAL PERMIT NO. EP-555/2018/A

MONTHLY ENVIRONMENTAL MONITORING & AUDIT REPORT

SEPTEMBER 2021

CLIENTS:

Highways Department

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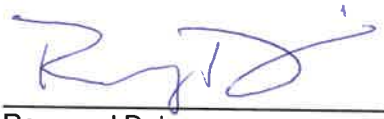

Raymond Dai
Environmental Team Leader

DATE:

18 October 2021

ANEWR

Highways Department
Works Division
7th Floor, Trade and Industry Tower
3 Concorde Road
Kowloon
Hong Kong

Your reference:

Our reference: HKHYD202/50/107589

Date: 18 October 2021

Attention: Mr Leo Poon

BY EMAIL & POST
(email: aek1-1.wd@hyd.gov.hk)

Dear Sirs

Agreement No. WD 23/2020
Environmental Monitoring and Audit for New Wang Tong River Bridge
Monthly Environmental Monitoring & Audit Report (September 2021)

We refer to emails of 12 and 15 October 2021 attaching a Monthly Environmental Monitoring & Audit Report (September 2021) prepared by the Environmental Team (ET) of the captioned.

We have no further comment and hereby verified the Monthly Environmental Monitoring & Audit Report (September 2021) in accordance with Clause 3.4 of the Environmental Permit no. EP-555/2018/A.

Should you have any queries, please do not hesitate to contact the undersigned or our Mr Frankie Yuen on 2618 2831.

Yours faithfully
ANEWR CONSULTING LIMITED

James Choi
Independent Environmental Checker

CPSJ/LCCR/YCFF/lsmt

cc Highways Department – Mr Lai Fu Keung (email: sephl1.wd@hyd.gov.hk)
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EXECUTIVE SUMMARY

i. This is the Environmental Monitoring and Audit (EM&A) Monthly Report – September 2021 of New Wang Tong River Bridge under Environmental Permit no. EP-555/2018/A (Hereafter as "the Project"). The construction works of the Project was commenced on 12 July 2021 and the tentative completion date is Q3 2024. This is the 3rd EM&A report presenting the environmental monitoring findings and information recorded during the period of 01 September 2021 to 30 September 2021. The cut-off date of reporting is at the end of each reporting month.

ii. In the reporting month, the principal work activities conducted are as follow:

- Pre-drilling Works

Air Quality Monitoring

iii. 1-hour and 24-hour Total Suspended Particulates (TSP) monitoring was conducted at two monitoring station. 24-hour TSP shall be sampled at least once in every 6 days, while sampling for 1-hour TSP shall be at least 3 times in every 6 day in the reporting month.

iv. No action or limit level exceedance was recorded in this reporting period.

Noise Monitoring

v. Noise monitoring was conducted at one noise monitoring station once per week in the reporting month.

vi. No action or limit level exceedance was recorded in this reporting period.

Water Quality Monitoring

vii. No water quality monitoring was conducted at seven monitoring stations three days per week in the reporting month due to no marine-based construction works.

viii. Owing to accessibility and safety issues, water quality monitoring at Station W3 was cancelled with verification from the IEC in November 2020 and approval from the EPD in December 2020.

Site Inspections and Audit

ix. The Environmental Team (ET) conducted weekly site inspections on 02, 09, 16 and 23 September 2021. IEC attended the joint site inspection on 23 September 2021. No non-compliance was found during the site inspection while reminders on environmental measures were recommended.

x. The Environmental Team (ET) conducted monthly landscape site inspections on 24 September 2021. No non-compliance was found during the site inspection.

Complaints, Notifications of Summons and Successful Prosecutions

xi. No environmental complaint, notification of summons and successful prosecution regarding the construction works was recorded in the reporting period.

Reporting Changes

xii. There are no particular reporting changes.

Future Key Issues

xiii. In coming reporting 3 months, the scheduled construction activities and the recommended mitigation measures are listed as follows:

Key Construction Works	Recommended Mitigation Measures
• Cofferdam construction • Construction plants mobilization • Preliminary piling	• Dust control during dust generating works; • Implementation of proper noise pollution control; • Provision of protection to ensure no runoff out of site area or direct discharge into Wang Tong River; and • Proper waste handling and storage;

1 Introduction

1.1 Scope of the Report

1.1.1. Lam Environmental Services Limited (LES) has been appointed to work as the Environmental Team (ET) under Environmental Permit (EP) no. EP-555/2018/A to implement the Environmental Monitoring and Audit (EM&A) programme as stipulated in the EM&A Manual of the approved Environmental Impact Assessment (EIA) Report for New Wang Tong River Bridge (Register No.: AEIAR-199/2016).

1.1.2. In accordance with Clause 3.4 stated in EP-522/2018/A, 1 hard copy and 1 electronic copy of Monthly EM&A Report shall be submitted to the Director within 10 working days after the end of each reporting month.

1.1.3. According to Section 10.3.1 of the Project EM&A Manual, the Monthly EM&A Report should be submitted within 10 working days of the end of each reporting month, with the first report due in the month after construction commences.

1.2 Structure of the Report

Section 1 ***Introduction*** – details the scope and structure of the report.

Section 2 ***Project Background*** – summarizes background and scope of the project, site description, project organization and contact details of key personnel during the reporting period.

Section 3 ***Status of Regulatory Compliance*** – summarizes the status of valid Environmental Permits / Licenses during the reporting period.

Section 4 ***Monitoring Requirements*** – summarizes all monitoring parameters, monitoring methodology and equipment, monitoring locations, monitoring frequency, criteria and respective event and action plan and monitoring programmes.

Section 5 ***Monitoring Results*** – summarizes the monitoring results obtained in the reporting period.

Section 6 ***Compliance Audit*** – summarizes the auditing of monitoring results, all exceedances environmental parameters.

Section 7 **Environmental Site Audit** – summarizes the findings of weekly site

inspections undertaken within the reporting period, with a review of any relevant follow-up actions within the reporting period.

Section 8 ***Complaints, Notification of summons and Prosecution*** – summarizes the cumulative statistics on complaints, notification of summons and prosecution

Section 9 ***Conclusion***

2 Project Background

2.1 Background

2.1.1. Silver Mine Bay is a popular bathing beach in Mui Wo, Lantau that attracted 4,550 visitors on a peak day and over 69,000 visitors utilized the beach in 2012.

2.1.2. In order to relieve the overcrowding problem and the road safety concern of Wang Tong Bridge (hereafter called "Old Bridge"), two bridges (pedestrian bridge and cycle bridge) are proposed to replace the Old Bridge. The new pedestrian bridge and the new cycle bridge (hereafter called "New Bridge") are also designed to align with the future amenity development on the northern side of the Old Bridge. The location of the project site is shown in ***Figure 2.1***.

2.1.3. The Project consists of a designated project under Part I, Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) which is Item C.12 – (a)…a dredging operation which is less than 500m from the nearest boundary of an existing…(iii) bathing beach…

2.1.4. The major components of the Project under Environmental Permit (EP) (EP No. EP-555/2018/A) comprises: (i) demolition of the existing Wang Tong River Bridge; and (ii) construction of a new twin bridge with segregation for pedestrians and cyclists.

2.2 Project Organization and Contact Personnel

2.2.1 Highways Department is the overall project controllers for the Project. For the construction phase of the Project, Contractor(s), Environmental Team and Independent Environmental Checker are appointed to manage and control environmental issues.

2.2.2 The project organization and lines of communication with respect to environmental protection works are shown in ***Figure 2.2***. Key personnel and contact particulars are summarized in ***Table 2.2***:

Table 2.2 Contact Details of Key Personnel

Party	Role	Post	Name	Contact No.	Contact Fax
Highways Department (HyD)	The Engineer for the Contract	Senior Engineer	Mr. Lai Fu Keung	3903 6792	3188 3418
	Engineer's Representative	Engineer	Mr. Yeung Sui Chung	3903 6813	3188 3418
Unison Construction Engineering Limited	Contractor	Site Agent	Mr. David Chiu	2690 2232	2363 3199
		Environmental Officer	Mr. Chiu Tse		
ANewR Consulting Limited	Independent Environmental Checker (IEC)	Independent Environmental Checker (IEC)	Mr. James Choi	2618 2831	3007 8648
Lam Environmental Services Limited	Environmental Team (ET)	Environmental Team Leader (ETL)	Mr. Raymond Dai	2882 3939	2882 3331

2.3 Construction Activities

2.3.1 In the reporting month, the principal work activities conducted are as follow.

- Pre-drilling Works

2.3.2 In coming reporting 3 months, the scheduled construction activities are listed as follows:

- Cofferdam construction
- Construction plants mobilization
- Preliminary piling

3 Status of Regulatory Compliance

3.1 Status of Environmental Licensing and Permitting under the Project

3.1.1. A summary of the current status on licences and/or permits on environmental protection pertinent to the Project is shown in ***Table 3.1***.

Table 3.1 Summary of the current status on licences and/or permits on environmental protection pertinent to the Project

Permits and/or Licences	Permit. No. / Account No.	Valid From	Expiry Date	Status
Notification pursuant to Air Pollution Control (Construction Dust) Regulation	Form NA submitted to EPD on 25 June 2021.			
Environmental Permit	EP-555/2018/A	16 Dec 2020	N/A	Valid
Billing Account for Disposal of Construction Waste	7038550	29 Mar 2021	End of the Project	Valid
Registration as a Chemical Waste Producer	5213-962-U2333-01	28 Jun 2021	N/A	Valid
Water Pollution Ordinance Licence	Under liaison with EPD Regional Office			
Construction Noise Permit	N/A			

3.2 Status of Submission under the EP-555/2018/A

3.2.1. A summary of the current status on submission under EP-555/2018/A is shown in ***Table 3.2***.

Table 3.2 Summary of submission status under EP-555/2018/A

EP Condition	Submission	Date of Latest Submission^ or Approval#
Condition 1.12	Notification of Commencement Date of Works	3 June 2021 ^
Condition 2.7	Submission of Management Organization of Main Construction Companies, the ET and the IEC	20 May 2021 ^
Condition 2.8	Submission of Construction Works Schedule and Location Plan	22 June 2021 #
Condition 2.9	Submission of Breeding Bird Survey Report	29 December 2020 #
Condition 3.3	Submission of Baseline Monitoring Report	24 June 2021 #
Condition 4.2	Setting up Dedicated Internet Website	28 April 2021 ^

4 Monitoring Requirements

4.1 Noise Monitoring

NOISE MONITORING STATIONS

4.1.1. The noise monitoring stations for the Project are listed and shown in ***Table 4.1*** and ***Figure 4.1.***

Table 4.1 Noise Monitoring Station

Monitoring Station ID	Monitoring Location	Measurement Type	Level (in terms of no. of floor)
NMS1 A	1 Tung Wan Tau Road	Free-field	G/F

Remarks A: As discussed with the lot owner, a fine adjustment of location at the boundary of 1 Tung Wan Tau Road was proposed and approved in the Baseline Monitoring Report, in order to prevent access obstruction.

NOISE MONITORING PARAMETERS, FREQUENCY AND DURATION

4.1.2. For daytime construction work on normal weekdays (0700-1900 Monday to Saturday), one set of 30-min measurement shall be carried out at each NMS every week. Measurement procedures shall be referred to the Noise Control Ordinance-TM. Construction noise level shall be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq\ 30min}$ shall be used as the monitoring parameter. As supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.

MONITORING EQUIPMENT

4.1.3. Noise monitoring was performed using sound level meter at the designated monitoring locations. The sound level meters shall comply with the International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator shall be deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in ***Table 4.2***.

Table 4.2 Noise Monitoring Equipment

Equipment	Brand and Model	Series Number
Integrated Sound Level Meter	Larson Davis LxT	3737
	Nti	A2A-15360-EO
Acoustic Calibrator	Larson Davis CAL200	13437

4.1.4. The calibration certificates of the noise monitoring equipment are attached in ***Appendix 4.2***.

SAMPLING PROCEDURE AND MONITORING EQUIPMENT

4.1.5. Monitoring Procedure

(a) The monitoring station shall normally be at a point 1m from the exterior of the sensitive receiver's building façade and be at a position 1.2m above the ground.

(b) Façade measurements were made at the monitoring locations. For free-field measurement, a correction factor of +3 dB (A) would be applied.

(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:

(e) Frequency weighting: A, Time weighting: Fast, Measurement time set: continuous 5 mins

(f) Prior and after to the noise measurement, the meter was checked 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.

4.1.6. Maintenance and Calibration

(a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.

(b) The sound level meter and calibrator were calibrated at yearly intervals.

EVENT AND ACTION PLAN

4.1.7. Noise Standards for Daytime Construction Activities are specified under EIAO-TM. The Action and Limit levels for construction noise are defined in ***Table 4.3*** and ***Appendix 4.1***. Should non-compliance of the criteria occurs, action in accordance with the Event and Action Plan in ***Appendix 6.1*** shall be carried out.

Table 4.3 Action and Limit Level for Noise Monitoring

Monitoring Station	Action Level	Limit Level
NMS1	When one documented complaint is received	75 dB(A)

4.2 Air Monitoring

AIR QUALITY MONITORING STATIONS

4.2.1. The air monitoring stations for the Project are listed and shown in ***Table 4.4*** and ***Figure 4.3***.

Table 4.4 Air Monitoring Station

Monitoring Station	Location	Level (in terms of no. of floor)
AMS1 [A]	Silvermine Beach Resort	G/F
AMS2 [B, C]	1 Tung Wan Tau Road	G/F

Remarks A: AMS1 recommended under EM&A manual is at the north of boundary wall of Silvermine Beach Resort. Positioning of HVS on a narrow road at the northern boundary wall would obstruct access of passengers. After liaison with the resort owner, HVS is located near the eastern boundary wall, which is representative and suitable for air quality monitoring. Thus, fine adjustment of location at the boundary of Silvermine Beach Resort was therefore proposed and approved in the Baseline Monitoring Report.

Remarks B: As discussed with the lot owner, a fine adjustment of location at the boundary of 1 Tung Wan Tau Road was proposed and approved in the Baseline Monitoring Report, in order to prevent access obstruction and to minimize noise nuisance induced from HVS operation.

Remarks C: As the agreement of ER and IEC, a fine adjustment of location at the boundary of 1 Tung Wan Tau Road was proposed and approved in the impact monitoring, in order to prevent the interruption of GI working area conducted by contractor.

AIR MONITORING PARAMETERS, FREQUENCY AND DURATION

4.2.2. One-hour and 24-hour TSP levels should be measured to indicate the impacts of construction dust on air quality.

4.2.3. 24-hour TSP shall be sampled at least once in every 6 days, while sampling for 1-hour TSP shall be at least 3 times in every 6 days when the highest dust impact takes place.

SAMPLING PROCEDURE AND MONITORING EQUIPMENT

4.2.4. 24-hour TSP Measuring Installation (HVS)

(a) The HVS was installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS.
(b) No furnace or incinerator flues were nearby.
(c) Airflow around the sampler was unrestricted
(d) 0.6 - 1.7 m^3 per minute adjustable flow range
(e) Equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operation;
(f) Installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation;
(g) Equipped with a shelter to protect the filter and sampler;
(h) Capable of operating continuously for a 24-hour period.

4.2.5. 24-hour Measuring Procedures

(a) The power supply was checked to ensure the HVS works properly.
(b) The filter holder and the area surrounding the filter were cleaned.
(c) 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.

(d) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.

(e) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges.

(f) Then the shelter lid was closed and was secured with the aluminum strip.

(g) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.

(h) A new flowrate record sheet was set into the flow recorder.

(i) The flow rate of the HVS was checked and adjusted at around 1.2 m^3 /min. The range specified in the EM&A Manual was between 0.6-1.7 m^3 /min.

(j) The programmable timer was set for a sampling period of 24 hrs + 1 hr, and the starting time, weather condition and the filter number were recorded.

(k) The initial elapsed time was recorded.

(l) At the end of sampling, the sampled filter was removed carefully and folded in half-length so that only surfaces with collected particulate matter were in contact.

(m) It was then placed in a clean plastic envelope and sealed.

(n) All monitoring information was recorded on a standard data sheet.

(o) Filters were sent to laboratory for further testing.

4.2.6. 1-hour Measuring Procedures

(a) Check the calibration period of portable direct reading dust meter prior to monitoring (The direct reading dust meter was calibrated at 2-years interval and checked with High Volume Sampler (HVS) yearly, details refer to Section 2.5.4)

(b) Record the site condition near / around the monitoring stations.

(c) Install the portable direct reading dust meter to the monitoring location.

(d) Slide the power switch to turn the power on.

(e) Check of portable direct reading dust meter to ensure the equipment operation in normal condition.

(f) Select the period of measurement to 60mins.

(g) Check and set the correct time.

(h) Select the appropriate unit display for the equipment.

(i) Slide the power switch to turn the power off when the monitoring period ended (3 times 1 hour TSP monitoring per day).

(j) Uninstall the portable direct reading dust meter

(k) Collected the sampled data for analysis.

Remark: Procedures (c) to (h) may be different subject to the brands and models of portable direct reading dust.

4.2.7. Maintenance and Calibration

(a) The direct reading dust meter was calibrated at 2-years interval and checked with High Volume Sampler (HVS) yearly to determine the accuracy and validity of the results measured.

(b) Checking of direct reading dust meter will be carried out in order to determine the conversion factor between the direct reading dust meter and the standard equipment,

HVS. The comparison check is to be considered valid based on correlation coefficient checked by HOKLAS laboratory

4.2.8. High Volume Sampler (HVS – Model TE-5170) completed with the appropriate sampling inlets were installed for the 24-hour TSP sampling. 1-hour TSP air quality monitoring was performed by using portable direct reading dust meters at each designated monitoring station, which was verified by IEC and approved by the Engineer's Representative (ER) on 4 December 2020 according to Section 3.4.5 and 3.3.2 of the Project EM&A Manual. The brand and model of the equipment are given in ***Table 4.5***.

Table 4.5 Air Quality Monitoring Equipment

Equipment	Brand and model	Series Number
Portable direct reading dust meter	Met One Aerocet 831	W15448 W15449 W16848 Y23153
High Volume Sampler	TE-5170	HVS019 HVS020

4.2.9. The calibration certificates of the air quality monitoring equipment are attached in ***Appendix 4.2***.

WIND DATA

4.2.10. Hong Kong Observatory (HKO) meteorological information is widely accepted to be used in various environmental monitoring practices within HKSAR due to its professional quality and precision. Therefore, the daily wind data including Prevailing Wind Direction (degrees) and Mean Wind Speed (km/h) were obtained from Peng Chau Automatic Weather Station to serve as the representative data for meteorological condition during monitoring. The method was agreed by the IEC and approved by the ER on 4 December 2020. The representative wind data from Peng Chau Station were obtained covering the 1-hour and 24-hour TSP monitoring periods. The wind data were extracted and shown in ***Appendix 4.3***.

EVENT AND ACTION PLAN

4.2.11. The Action and Limit levels for construction air quality are defined in ***Table 4.6*** and ***Appendix 4.1***. Should non-compliance of the air quality criteria occur, action in accordance with the Event and Action Plan in ***Appendix 6.1*** shall be carried out.

Table 4.6 Action and Limit Level for Air Quality Monitoring

Parameter	Monitoring Station	Action Level (μg/m^3)	Limit Level (μg/m^3)
24-hour TSP Level	AMS1	176.0	260.0
	AMS2	176.0	260.0
1-hour TSP Level	AMS1	276.5	500.0

	AMS2	283.7	500.0

4.3 Water Quality Monitoring

WATER QUALITY MONITORING STATIONS

4.3.1. Water quality monitoring was undertaken at 7 monitoring stations in the reporting month. The proposed water quality monitoring stations of the Project are shown in ***Table 4.7*** and ***Figure 4.3***.

Table 4.7 Marine Water Quality Stations for Water Quality Monitoring

Station	Description	Monitoring Period	Monitoring Station	Easting	Northing
W1	Wang Tong River (Major tributary)	Mid-Flood	Impact	817747	814519
		Mid-Ebb	Control		
W2	Wang Tong River (Major tributary)	Mid-Flood	Impact	817775	814471
		Mid-Ebb	Control		
W3 *	Wang Tong River (Minor tributary to Tai Wai Yuen)	Mid-Flood	Impact	817803	814537
		Mid-Ebb	Control		
W4	Wang Tong River (Minor tributary to Tai Wai Yuen)	Mid-Flood	Impact	817825	814481
		Mid-Ebb	Control		
W5	Silvermine Bay (Near Silvermine Bay Beach)	Mid-Flood	Control	817909	814452
		Mid-Ebb	Impact		
W6	Silvermine Bay (Near Silvermine Bay Beach)	Mid-Flood	Control	818024	814447
		Mid-Ebb	Impact		
W7	Silvermine Bay (Open Water)	Mid-Flood	Control	818061	814277
		Mid-Ebb	Impact		
W8	Silvermine Bay (Open Water)	Mid-Flood	Control	818224	814444
		Mid-Ebb	Impact		

Remark *: Water quality monitoring at Station W3 was cancelled with verification from the IEC and approval from the EPD.

WATER QUALITY PARAMETERS, FREQUENCY AND DURATION

4.3.2. The levels of dissolved oxygen (DO), turbidity, salinity and pH shall be measured in situ while suspended solids (SS) is determined by laboratory analysis at all the designated monitoring stations.

4.3.3. In association with the water quality parameters, other relevant data shall also be recorded, such as monitoring location / position, time, water temperature, DO saturation, weather conditions, and any special phenomena underway near the monitoring station.

4.3.4. Impact Monitoring shall be carried out 3 days per week, at mid-flood and mid-ebb tides (within ± 1.75 hour of the predicted time). The interval between two sets of monitoring shall not be less than 36 hours. The monitoring period should avoid concurrent marine project in the vicinity.

4.3.5. The sampling frequency of at least three days per week should be undertaken when the highest dust impact occurs. Upon completion of the construction works, the monitoring exercise at the designated monitoring locations should be continued for four weeks in the

same manner as the impact monitoring. In case exceedance of Action/Limit Level is recorded, the frequency shall be increased as per the Event and Action Plan.

4.3.6. To ensure the robustness of in-situ measurement, parameters shall be measured in duplicate. In case the difference between duplicates is larger than 25%, a third set of measurement shall be carried out.

SAMPLING PROCEDURES AND MONITORING EQUIPMENT

Dissolved Oxygen, pH And Temperature Measuring Equipment

4.3.7. The instrument should be a portable, weatherproof dissolved oxygen and pH measuring instrument complete with cable, sensor, comprehensive operation manuals, and use a DC power source. It should be capable of measuring:

- a dissolved oxygen level in the range of 0-20 mg/l and 0-200% saturation
- a pH level in the range of 0 to 14 units
- a temperature of 0-45 degree Celsius

4.3.8. It should have a membrane electrode with automatic temperature compensation complete with a cable. Sufficient stocks of spare electrodes and cables should be available for replacement where necessary. Salinity compensation shall be build-in in the DO equipment

Turbidity Measurement Instrument

4.3.9. Nephelometric method shall be used in measuring turbidity in-situ. The instrument shall be portable, weatherproof complete with a cable, sensor, comprehensive operation manuals and DC power source. It shall have a photoelectric sensor capable of measuring turbidity between 0-1000 NTU and complete with a cable with at least 25 m in length. The meter shall be calibrated in order to establish the relationship between NTU units and suspended solids level. Turbidity shall be measured on split water sample collected from the same depths of suspended solid samples.

Sampler

4.3.10. A water sampler, consisting of a transparent PVC or glass cylinder of a capacity of not less than two litres which can be effectively sealed with cups at both ends shall be used. The water sampler shall have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth.

Sampler Container and Storage

4.3.11. A water sampler, Water samples for suspended solids measurement should be collected in high-density polythene bottles, packed in ice (cooled to 4°C without being frozen), and delivered to ALS Technichem (HK) Pty Ltd. as soon as possible after collection for analysis.

Water Depth Detector

4.3.12. A portable, battery-operated echo sounder shall be used for the determination of water depth at each designated monitoring station. This unit can either be handheld or affixed to the bottom of the workboat, if the same vessel is to be used throughout the monitoring programme.

Salinity

4.3.13. A portable salinometer capable of measuring salinity in the range of 0-40% shall be provided for measuring salinity of the water at each of monitoring location.

Monitoring Position Equipment

4.3.14. A hand-held or boat-fixed type digital Global Positioning System (GPS) with waypoint bearing indication or other equivalent instrument of similar accuracy shall be provided and used during monitoring to ensure the monitoring vessel is at the correct location before taking measurements.

MONITORING METHODOLOGY

4.3.15. Monitoring Procedure

(a) The condition near the monitoring stations shall be observed and recorded on the data log sheet.
(b) Check of sensors and electrodes with certified standard solutions before each use.
(c) Wet bulb calibration for a DO meter should be carried out before measurement.
(d) Water depth should be recorded by detector before sampling.
(e) Sample would be taken using bucket sampler at surface level.
(f) Transfer the sampled water carefully into cleaned water bottles (2x 1000ml) provided by the laboratory at the spot after the collection of the water sample for the subsequent laboratory Suspended Solid testing.
(g) Transfer the sampled water from the bucket sampler to the rinsed water container for in-situ measurement (In case of the in-situ measurement cannot be carried at spot due to safety and adverse weather condition, sampled water from the bucket sampler will be transfer to cleaned water bottles provided by laboratory. Then, In-situ measurement will be conducted at a safe location which sampled water inside cleaned water bottle will be transfer to the rinsed water container for in-situ measurement) In-situ measurement shall be measured in duplicate.
(h) Parameters including Water Temperature (°C), pH (units), Salinity (ppt), DO (mg/L), DO saturation (%) will be measured by the Multifunctional Meter and Turbidity (NTU) will be measured by turbid meter. (Water Temperature and Salinity will be measured as reference parameters)
(i) Record the result on the data log sheet and record any special finding during / after in-situ measurement.
(j) The water sample bottles will be stored in a cool box (at cooled to 4℃ without being frozen), which shall be delivered to HOKLAS laboratory (ALS Technichem (HK) Pty Ltd) for further testing to determine the level of SS.

4.3.16. Maintenance and Calibration

(a) The responses of sensors and electrodes of the water quality monitoring equipment were cleaned and checked at regular intervals.

(b) DO meter (Multifunctional Meter) and turbid meter was certified by a laboratory accredited under HOKLAS or any other international accreditation scheme, and subsequently re-calibrated at three monthly intervals.

4.3.17. Brand and model of the equipment are given in ***Table 4.8***.

Table 4.8 Water Quality Monitoring Equipment

Equipment	Brand and model	Series Number
Multifunctional Meter	YSI Professional Plus	N/A
Turbid meter	Xin Rui WGZ-3B	N/A

4.3.18. Due to no marine-based construction works, water quality monitoring was not conducted. Calibration certificates of the water quality monitoring equipment to be attached in ***Appendix 4.2*** will be prepared in the upcoming reporting month during commencement of monitoring.

LABORATORY MEASUREMENT / ANALYSIS

4.3.19. Analysis of suspended solids will be carried out in a HOKLAS accredited laboratory, which is ALS Technichem (HK) Pty Ltd.

EVENT AND ACTION PLAN

4.3.20. The Action and Limit levels for construction water quality are defined in **Table 4.9** and ***Appendix 4.1***. Should the monitoring results of the water quality parameters at any designated monitoring station exceed the water quality criteria, action in accordance with the Event and Action Plan in ***Appendix 6.1*** shall be carried out.

Table 4.9 Action and Limit Level for Water Quality Monitoring

Monitoring Station	Depth	DO (mg/L) +		Turbidity (NTU) ~		SS (mg/L) ~	
		Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level
W1	Surface, Middle & Bottom	6.5	5.3	7.7 NTU or 120% of upstream control station's turbidity at the same	12.4 NTU or 130% of upstream control station's turbidity at the same	8.9 mg/L or 120% of upstream control station's SS at the same tide of the	11.3 mg/L or 130% of upstream control station's SS at the same tide of the
W2							

W4				tide of the same day, whichever is higher	tide of the same day, whichever is higher	same day, whichever is higher	same day, whichever is higher
W5	Surface, Middle & Bottom	5.9	5.5	9.8 NTU or 120% of upstream control station's turbidity at the same tide of the same day, whichever is higher	10.5 NTU or 130% of upstream control station's turbidity at the same tide of the same day, whichever is higher	12.6 mg/L or 120% of upstream control station's SS at the same tide of the same day, whichever is higher	15.0 mg/L or 130% of upstream control station's SS at the same tide of the same day, whichever is higher
W6							
W7							
W8	Surface & Middle						
	Bottom	5.9	5.5				

Remarks +: For DO, non-compliance occurs when monitoring results is lower than the limits.
Remarks ~: For SS and Turbidity, non-compliance occurs when monitoring results is larger than the limits

5 Monitoring Results

5.0.1 The environmental monitoring will be implemented based on the division of works areas of each designed projects. Overall layout showing work areas and monitoring stations is shown in ***Figure 2.1*** and ***Figure 4.1 – 4.3*** respectively**.**

5.0.2 The environment monitoring schedules for reporting month and coming month are presented in ***Appendix 5.1*****.**

5.1 Noise Monitoring Results

5.1.1 Noise monitoring results measured in this reporting period are reviewed and summarized. Details of noise monitoring results and graphical presentation can be referred in ***Appendix 5.2***.

5.1.2 No action or limit level exceedance was recorded in this reporting month.

5.2 Air Monitoring Results

5.2.1 Air quality monitoring results measured in this reporting period are reviewed and summarized. Details of air monitoring results and graphical presentation can be referred in ***Appendix 5.3***.

5.2.2 No action or limit level exceedance was recorded in this reporting month.

5.3 Water Quality Monitoring Results

5.3.1 Due to no marine-based construction works in the reporting period, no water quality monitoring was conducted. Water quality monitoring results to be measured in the upcoming reporting period will be reviewed and summarized. Details of water quality monitoring results and graphical presentation will be referred in ***Appendix 5.4***.

5.4 Waste Management

5.4.1 The quantities of waste for disposal in the Reporting Period are summarized in ***Table 5.1*** and ***Table 5.2***. The Monthly Summary Waste Flow Table is shown in ***Appendix 5.5***. Whenever possible, materials were reused on-site as far as practicable.

Table 5.1 Summary of Quantities of Inert C&D Materials

Waste Type	Quantity (this month)	Quantity (Project commencement to the end of last month)	Cumulative Quantity-to-Date
Hard Rock and Large Broken Concrete (Inert) (in '000m^3)	0	0.007	0.007
Reused in this Contract (Inert) (in '000m^3)	0	0	0
Reused in other Projects (Inert) (in '000m^3)	0	0	0
Disposal as Public Fill (Inert) (in '000m^3)	0	0	0

Table 5.2 Summary of Quantities of C&D Wastes

Waste Type	Quantity (this month)	Quantity (Project commencement to the end of last month)	Cumulative Quantity-to-Date
Metals (in '000kg)	0	0	0
Paper / Cardboard Packing (in '000kg)	0	0	0
Plastics (in '000kg)	0	0.03	0.03
Chemical Wastes (in '000kg)	0	0	0
General Refuses (in '000m^3)	0	0.014	0.014

6 Compliance Audit

6.1.1 The Event Action Plan for construction noise, air quality and water quality are presented in ***Appendix 6.1.***

6.1.2 The summary of exceedance is presented in ***Appendix 6.2.***

6.2 Noise Monitoring.

6.2.1 No action or limit level exceedance was recorded in this reporting period.

6.3 Air Quality Monitoring

6.3.1 No action or limit level exceedance was recorded in this reporting period.

6.4 Water Quality Monitoring

6.4.1 Due to no marine-based construction works in the reporting period, no water quality monitoring was conducted.

6.5 Review of the Reasons for and the Implications of Non-compliance

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

6.6 Summary of action taken in the event of and follow-up on non-compliance

6.6.1 There was no particular action taken since no non-compliance was recorded in the reporting period.

7 Environmental Site Audit

7.0.1. Within this reporting month, weekly environmental site audits were conducted on 2, 09, 16, 23 and 28 September 2021. IEC attended the joint site inspection on 23 September 2021.

7.0.2. No non-compliance was found during the site inspection while reminders on environmental measures were recommended. Results and findings of these inspections in this reporting month are listed below in ***Table 7.1***.

Table 7.1 Summary of Environmental Inspections

Item	Date	Reminder(s)/ Observation(s)	Action taken by Contractor	Outcome
20210916_1	16 Sep 2021	Overflow from the sedimentation tank should be avoided.	As observed on 23 Sep, sedimentation tank is well maintained to avoid overflow.	Completion as observed on 23 Sep 2021
20210916_2	16 Sep 2021	The drip tray of the drilling rig should be fixed.	As observed on 23 Sep, the drip tray has been replaced to avoid chemical leakage.	Completion as observed on 23 Sep 2021
20210923_1	23 Sep 2021	Sedimentation tank shall be desilted regularly to avoid overflow and to ensure sufficient capacity.	As observed on 23 Sep, Sedimentation tank	Completion as observed on 23 Sep 2021
20210923_2	23 Sep 2021	Bulk bentonite bags shall be relocated to a proper storage location to protect from damage or washout onto ground near river.	As observed on 23 Sep, bulk bentonite bags are relocated to proper storage area.	Completion as observed on 23 Sep 2021
20210923_3	23 Sep 2021	Chemical drum shall be returned to drip tray after use.	As observed on 23 Sep, the chemical is returned to drip tray.	Completion as observed on 23 Sep 2021
20210928_1	28 Sep 2021	The contractor shall remove general refuse onsite for better housekeeping.	As observed on 28 Sep, the site is cleaned up immediately.	Completion as observed on 28 Sep 2021

7.0.3. Within this reporting month, monthly landscape site audits were conducted on 24 September 2021.

7.0.4. No non-compliance was found during the landscape site inspection. Results and findings of these inspections in this reporting month are listed below in ***Table 7.2***.

Table 7.2 Summary of Landscape site inspections

Item	Date	Reminder(s)/ Observation(s)	Action taken by Contractor	Outcome
-	-	-	-	-

8. Complaints, Notification of Summons and Prosecution

8.0.1. No environmental complaint, notification of summons and successful prosecution regarding construction works was recorded in the reporting period.

8.0.2. The details of cumulative complaint log and updated summary of complaints are presented in ***Appendix 8.1.***

8.0.3. Cumulative statistic on complaints and successful prosecutions are summarized in ***Table 8.1*** and ***Table 8.2*** respectively.

Table 8.1 Cumulative Statistics on Complaints

Reporting Period	No. of Complaints
September 2021	0
Project commencement to the end of last reporting month	-
Total	**0**

Table 8.2 Cumulative Statistics on Successful Prosecutions

Environmental Parameters	Cumulative No. Brought Forward	No. of Successful Prosecutions this month (Offence Date)	Cumulative No. Project-to-Date
Air	-	0	0
Noise	-	0	0
Water	-	0	0
Waste	-	0	0
Total	**-**	**0**	**0**

9. Conclusion

9.0.1. The EM&A programme was carried out in accordance with the EM&A Manual requirements, minor alterations to the programme proposed were made in response to changing circumstances.

9.0.2. Mitigation measures according to the environmental mitigation implementation schedule and the EIA were generally implemented by the Contractor. Hence, the EM&A programme was considered effective and shall be maintained.

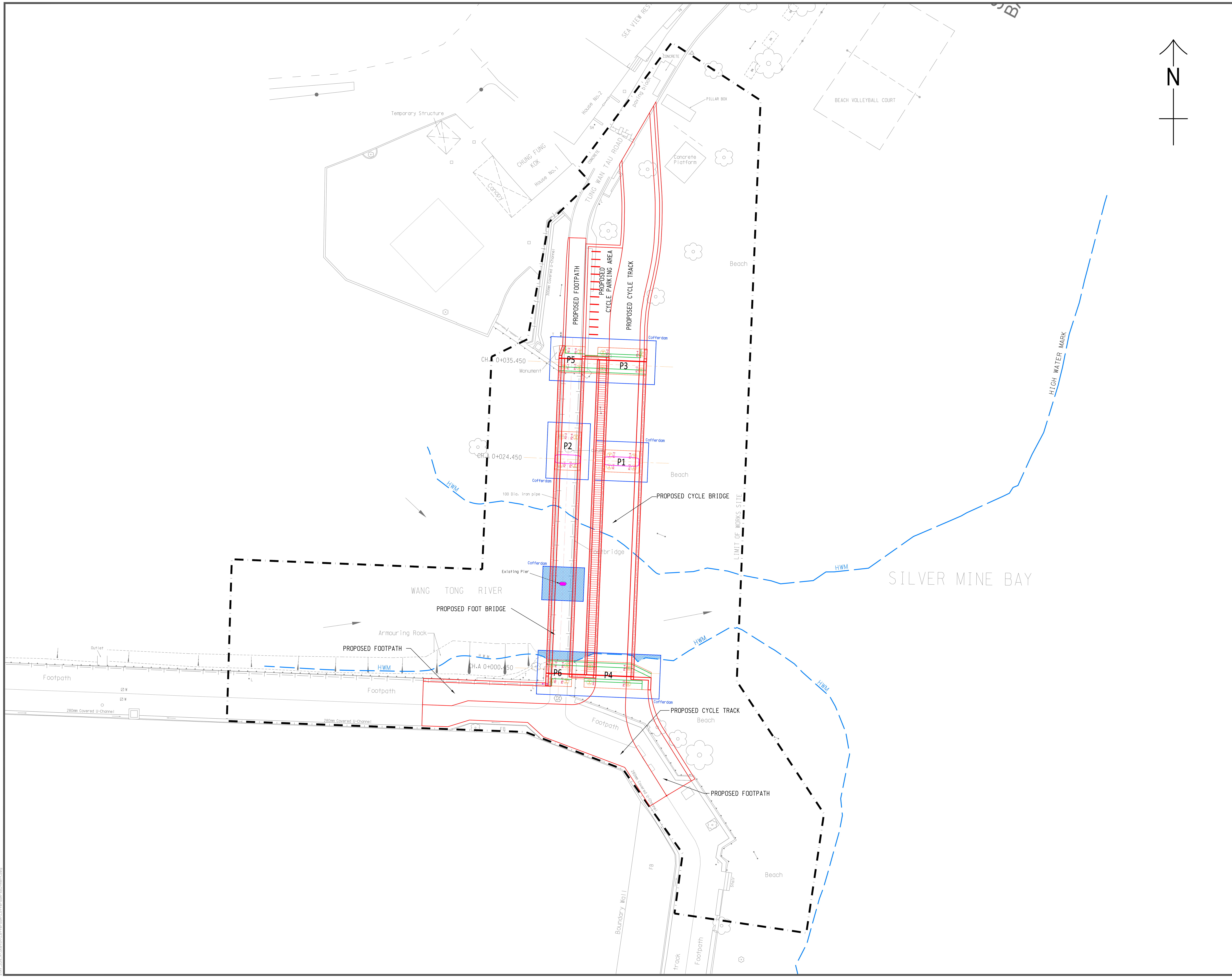
9.0.3. The scheduled construction activities and the recommended mitigation measures for the coming 3 months are listed in ***Table 9.1***. The construction programmes of the Project are provided in ***Appendix 9.1.***

Table 9.1 Construction Activities and Recommended Mitigation Measures in Coming Reporting 3 Months

Key Construction Works	Recommended Mitigation Measures
• Cofferdam construction • Construction plants mobilization • Preliminary piling	• Dust control during dust generating works; • Implementation of proper noise pollution control; • Covering noisy part of piling machine with proper sound insulation material. • Provision of protection to ensure no runoff out of site area or direct discharge into Wang Tong River; and • Proper waste handling and storage;

Figure 2.1

Project Layout



NOTES

1. ALL LEVELS ARE IN METRES ABOVE HONG KONG PRINCIPAL DATUM.
2. CO-ORDINATES ARE OF HONG KONG 1980 GRID SYSTEM.
3. ALL LEVELS ALONG KERB ARE KERB BOTTOM LEVEL.
4. CHANNELS ARE U SHAPED EXCEPT WHERE STATED, WIDTHS ARE GIVEN.
5. DATE OF SURVEY FOR HIGH WATER MARK : NOV 2020

LEGEND:

- LIMIT OF WORKS SITE
- HIGH WATER MARK (AS AT NOV.2020)
- PROPOSED PILECAP AND SOCKETED H PILES
- EXCAVATION AND PILING WORKS AREA WITHIN COFFERDAM
- EXCAVATION AREAS BELOW HIGH WATER MARK
- PROPOSED BRIDGE PIERS
- EXTENT OF ABUTMENTS
- WORKS LAYOUT

SOURCE

PROJECT

HY/2019/14

NEW WANG TONG RIVER BRIDGE

DRAWING TITLE

LOCATION PLAN

SCALE	1:200	A1 594X841
DRAWING NO.	CLP-EP-01	REV. -

Figure 2.2

Project Organization Chart

Project Organization Chart

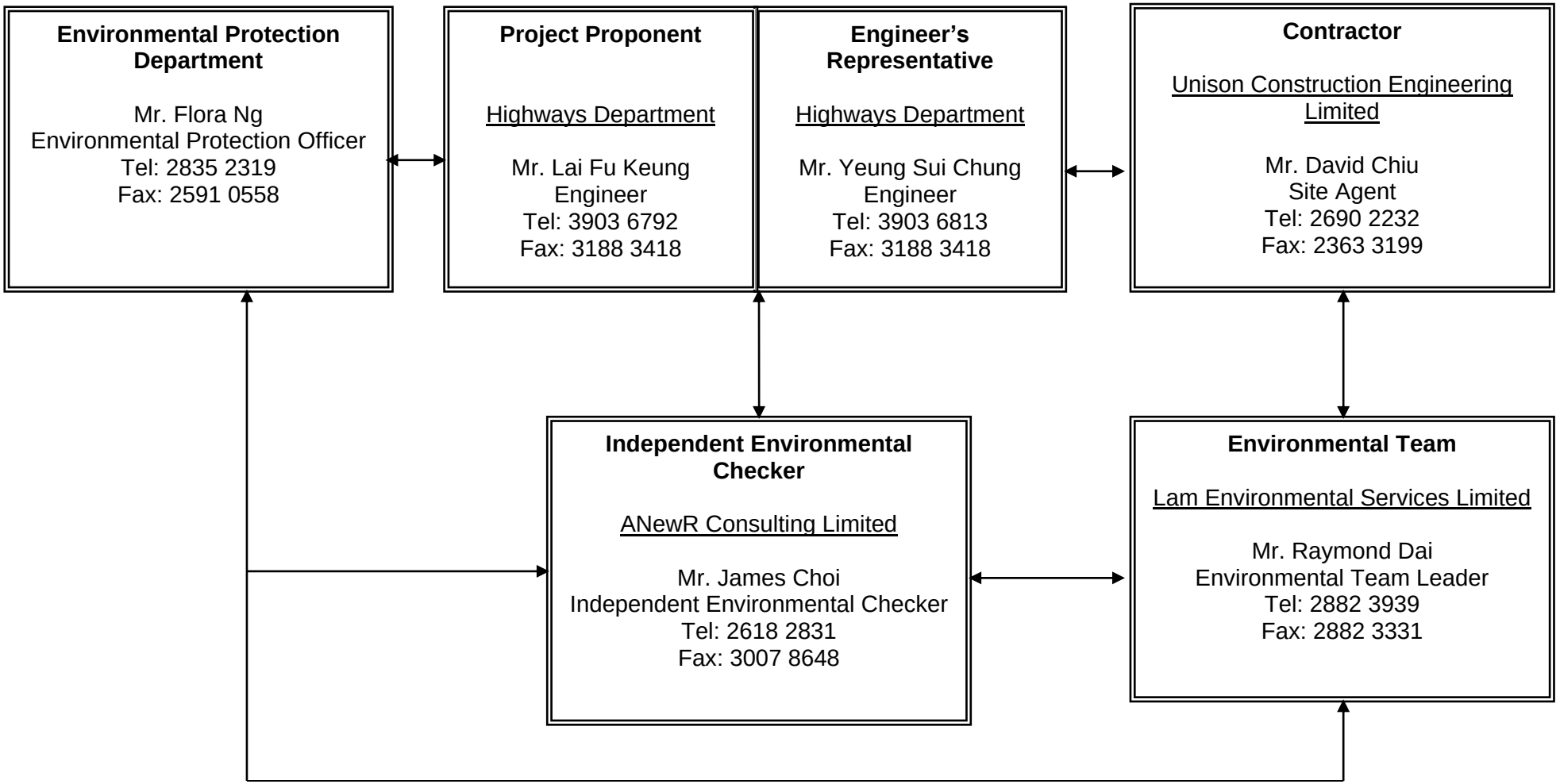
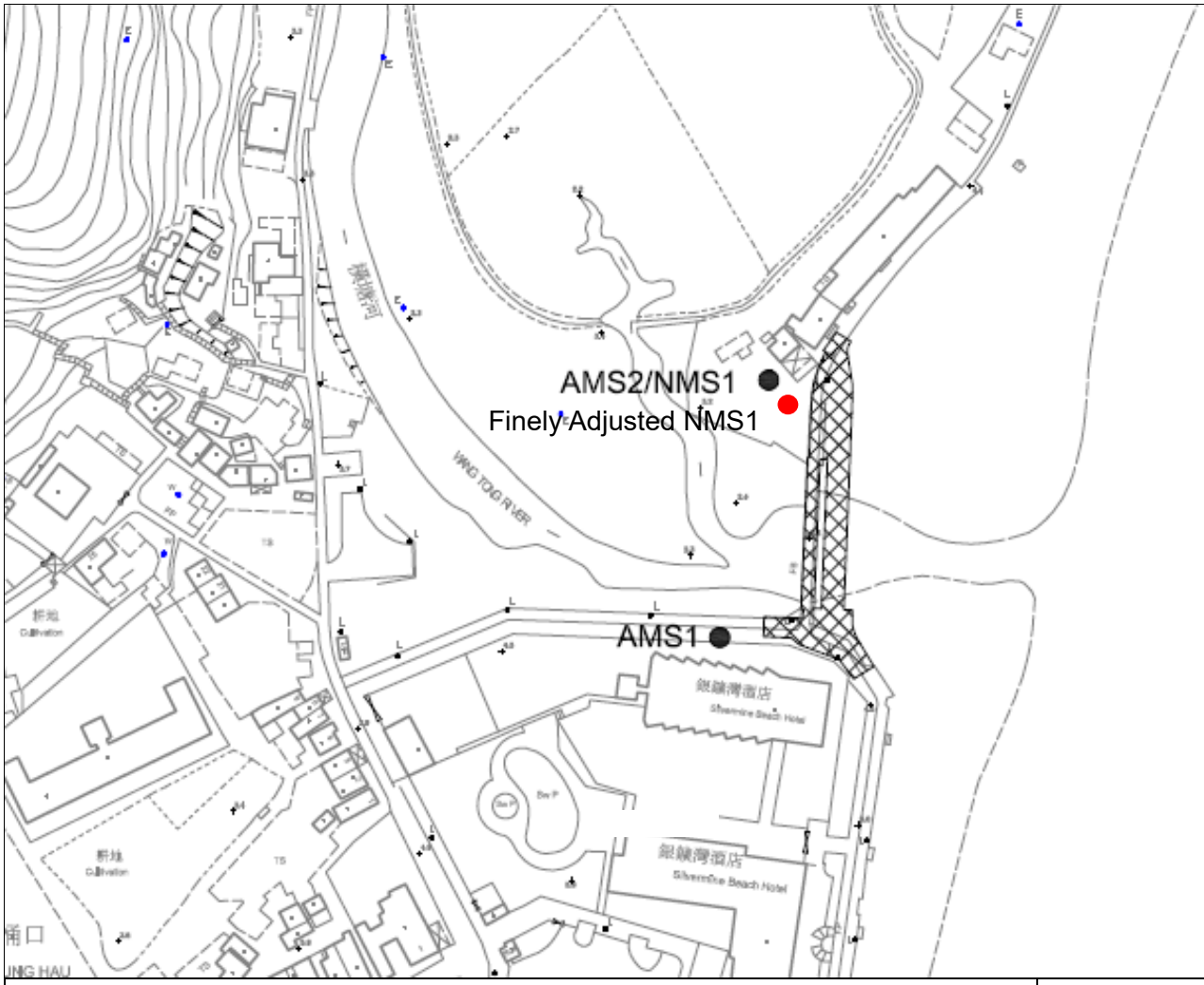


Figure 2.2

Figure 4.1 to Figure 4.3

Locations of Monitoring Stations



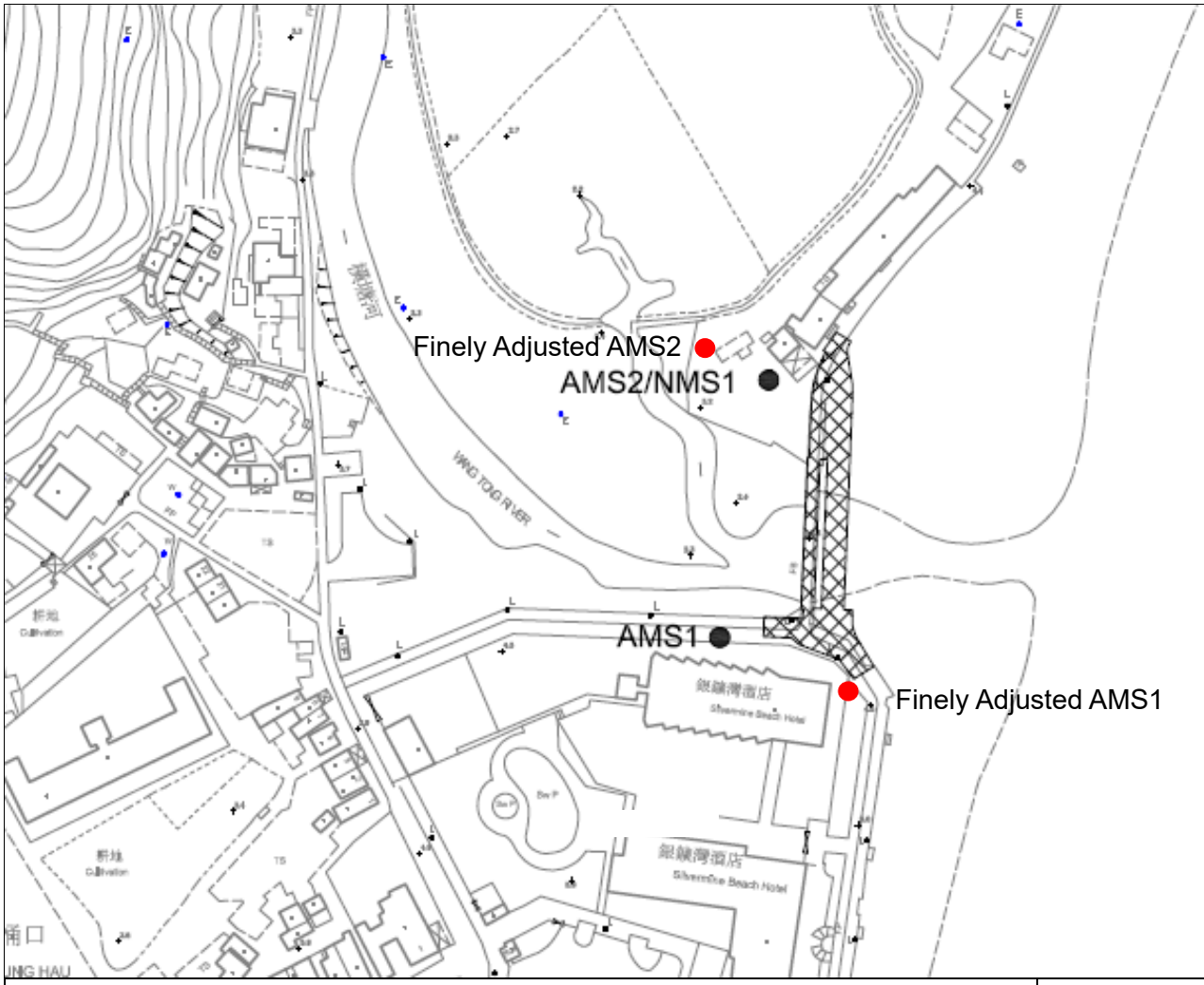
Station	Description
AMS2/NMS1	1 Tung Wan Tau Road

Legend:

- Finely Adjusted Location of Noise Monitoring Station
- Original Noise Monitoring Station stated in EM&A Manual

Figure 4.1

Location of Noise Monitoring Stations



Station	Description
AMS1	Silver Beach Resort
AMS2/NMS1	1 Tung Wan Tau Road

Legend:

- Finely Adjusted Location of Air Quality Monitoring Station
- Original Air Quality Monitoring Station stated in EM&A Manual

Figure 4.2

Location of Air Quality Monitoring Stations

Station	Description	Easting	Northing
W1	Wang Tong River (Major tributary)	817747	814519
W2	Wang Tong River (Major tributary)	817775	814471
W4	Wang Tong River (Minor tributary to Tai Wai Yuen)	817825	814481
W5	Silvermine Bay (Near Silvermine Bay Beach)	817909	814452
W6	Silvermine Bay (Near Silvermine Bay Beach)	818024	814447
W7	Silvermine Bay (Open Water)	818061	814277
W8	Silvermine Bay (Open Water)	818224	814444

Legend:

- Cancelled Water Quality Monitoring Station
- Original Water Quality Monitoring Station stated in EM&A Manual

Figure 4.3

Location of Water Quality Monitoring Stations

Appendix 3.1

Environmental Mitigation Implementation Schedule

Appendix 3.1 - Implementation Schedule of Recommended Mitigation Measures

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
Air Quality Impact						
Construction Phase						
A1	Good housekeeping to minimize dust generation, e.g. by properly handling and storing dusty materials	To minimize dust generation	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A2	Adopt dust control measures, such as dust suppression using water spray on exposed soil, in areas with dusty construction activities, and during material handling	To minimize dust generation due to erosion	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A3	Dust suppression shall be applied to the working area immediately before, during and immediately after site clearance, excavation or earth moving operation to keep the surface wet.	To minimize dust generation due to erosion	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A4	Use water spray to wet the remaining dusty materials on the floor after removing stockpile. The surface of roads or streets shall be free from dust	To minimize dust generation due to erosion	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A5	Storage of dusty materials and debris shall be either entirely covered by impervious sheeting or stored in a three-side and top enclosed area. Alternatively, it should be sprayed with water or a dust suppression chemical to maintain the entire surface wet	To minimize dust generation due to erosion	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A6	All demolished items (e.g. trees, vegetation, structures, debris and rubbish) that may dislodge dust particles shall be covered entirely by impervious sheeting or placed in a three-side and top enclosed area within a day of demolition.	To minimize dust generation	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A7	Store cement bags in shelter with 3 sides and the top covered by impervious materials if the stack exceeds 20 bags	To prevent leakage of cement	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A8	Cement bag shall be debagged, batched and mixed in a three-side and top enclosed area	To minimize dust generation	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A9	Maintain a reasonable height when dropping excavated materials to limit dust generation	To minimize dust generation during movement of excavated materials	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A10	Minimize exposed earth after completion of work in a certain area by hydroseeding, vegetating, soil compacting or paving	To minimize dust generation due to erosion	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
A11	Cover materials on trolleys and trucks before leaving the site to prevent debris from dropping during traffic movement or being blown away by wind	To prevent falling of debris during traffic movement and by wind	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A12	Water or a dust suppression chemical shall be continuously sprayed on the surface where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation is carried out, unless the process is accompanied by the operation of an effective dust extraction and filtering device	To minimize dust emission	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A13	Regular maintenance of plant equipment to prevent black smoke emission	To minimize black smoke emission	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A14	Throttle down or switch off unused machines or machine in intermittent use	To minimize unncessary emission	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A15	Minimize excavation area as far as possible	To minimize dust emission and potential release of odour from exposed ground	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A16	Cover open stockpiles of construction materials (e.g. aggregates, sand and fill materials) with impermeable materials such as tarpaulin during rainstorms.	To prevent soil erosion under rainstorm	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A17	Hoarding of not less than 2.4 m high shall be erected from ground level to surround the work area except for a site entrance or exit	To minimize dust emission	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A18	Carry out air quality monitoring throughout the construction period	To monitor construction dust level	HyD's Contractor	At representative ASRs	Prior to and throughout construction phase	EIAO-TM
A19	Carry out regular site inspection to audit the implementation of mitigation measures	To check the implemenation status and effectiveness of mitigation measures	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
Noise Impact						
Construction Phase						
N1	Schedule noisy activities to minimise exposure of nearby NSRs to high levels of construction noise	To minimize construction noise level	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N2	Use hand-held plant equipment or manual equipment as far as possible	To minimize construction noise level	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N3	Use Quality Powered Mechanical Equipment (QPME) which produces lower noise level	To minimize construction noise level	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N4	In the direction of noise sensitive receivers, erect mobile barriers with 3m in height from a few metres of stationary plants, and from about 5m of more mobile plant such as hydraulic breaker to prevent direct view. The barrier should have skid footing and a small cantilevered upper portion. The minimum surface density of the movable noise barrier is 7 kg/m² and provide with noise absorbing material.	To lower noise transmission	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N5	Position mobile noisy equipment in location and direction away from NSR	To minimize noise transmission to NSR	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N6	Use silencer or muffler on plant equipment and should be properly maintained	To minimize noise transmission	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N7	Operate noisy plant equipment such as air compressor, generator and concrete pump within enclosure	To minimize noise transmission	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N8	Cover the noisy part of piling machine with acoustic mat	To minimize noise transmission	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N9	Throttle down or switch off unused machines or machine in intermittent use between work	To mimize noise production	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N10	Avoid carrying out noisy activities at the same time	To mimize noise production	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
N11	Reduce the percentage on-time for some noisy PMEs	To mimize noise production	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N12	Carry out noise monitoring throughout the construction period	To monitor construction noise level	HyD's Contractor	At representative NSRs	Prior to and throughout construction phase	EIAO-TM

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
Water Quality Impact						
Construction Phase						
W1	Works in the river (excavation within highwater mark and cutting of pier of Old Bridge) shall be carried out inside the watertight cofferdam. The cofferdam can only be removed after completion of work.	To prevent the excavated materials or cuttings from falling into the water and being carried into the sea	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM
W2	Install sheet piles by vibratory action.	To minimize dispersion of sand	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W3	Erect water-tight temporary working platform that can contain falling debris above Wang Tong River. The platform shall be sheltered by tarpaulin for directing rainwater away from the working platform.	To prevent falling of debris and generation of surface runoff into the river	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W4	Water removed from the cofferdam should be desilted before discharge.	To prevent discharge of silty water	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM
W5	Set up sedimentation tank for settling suspended solids in wastewater before discharge into storm drains. Sand/silt removal facilities such as sand traps, silt traps and sedimentation basin should be provided with adequate capacity.	To reduce the amount of suspended solid in wastewater	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W6	Maintain silt removal facilities, channels, manholes before and after rainstorm.	To prevent failure that may lead to flooding	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W7	Remove silt and grit from silt trap at regular interval.	To prevent blockage that may lead to flooding	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W8	Design works program carefully to minimize work areas, hence minimize soil exposure and site runoff.	To minimize surface runoff and chance of erosion	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W9	Arrange excavation works outside rainy seasons (April to September) as far as possible. If this cannot be achieved, the following measures should be implemented: - Cover temporary exposed slope surfaces with impermeable materials, e.g. tarpaulin - Protect temporary access roads by crushed stone or gravel - Carry out adequate surface protection measures well before the arrival of a rainstorm	To minimize surface runoff and chance of erosion	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
W10	Minimize exposed earth after completion of work in a certain area by hydroseeding, vegetating, soil compacting or paving	To prevent soil erosion under rainstorm	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W11	Cover open stockpiles of construction materials (e.g. aggregates, sand and fill materials) with impermeable materials such as tarpaulin during rainstorms.	To prevent soil erosion under rainstorm	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W12	Cover and temporary seal manholes to prevent silt, construction materials or debris and surface runoff from entering foul sewers.	To prevent overloading of foul sewers	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W13	Placing equipment, materials and wastes away from Wang Tong River and Silver Mine Bay	To prevent water contamination	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM
W14	Remove waste from the site regularly.	To prevent waste accumulation	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W15	Apply discharge license for effluent discharge. Treat the discharge to comply with the requirement in TM-DSS.	To ensure compliance with effluent discharge requirement	HyD's Contractor	Whole construction site	Throughout construction phase	WPCO, TM-DSS, EIAO-TM
W16	Reuse treated effluent onsite, e.g. dust suppression and general cleaning.	To minimize wastewater generation	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM
W17	Monitor effluent water quality.	To ensure compliance with effluent discharge requirement	HyD's Contractor	Whole construction site	Throughout construction phase	WPCO, EIAO-TM
W18	Register as chemical waste producer if chemical waste will be generated.	To control chemical waste	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal (Chemical Waste) (General) Regulation, EIAO-TM
W19	Perform maintenance of vehicles and equipment that have oil leakage and spillage potential on hard standings within a bunded area with sumps and oil interceptors.	To prevent oil leakage or spillage	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal (Chemical Waste) (General) Regulation, EIAO-TM
W20	Dispose chemical waste in accordance to Waste Disposal Ordinance. Follow the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes* , examples as follows: - Store chemical wastes at designated safe location with adequate space	To avoid accident in waste storage and handling	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM
W21	Placing chemical toilet away from waterbodies as far as possible and on stable, impermeable surface	To minimize accidental leakage of sewage into waterbodies	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
W22	Carry out water quality monitoring at water sensitive receivers	To identify any water quality impact due to the project	HyD's Contractor	Whole construction site	Before, throughout and after construction phase	EIAO-TM
W23	Carry out regular site inspection to audit the implementation of mitigation measures	To check the implemenation status and effectiveness of mitigation measures	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
Ecological Impact						
Construction Phase						
E1	Before site clearance, the work area should be inspected by ecologist to confirm no active bird nest is present. If any active bird nest is identified, suitable size of buffer area should be established until the nest is abandoned.	To minimize direct impact on the breeding activity of Black-collared Starling	HyD's Contractor	Whole construction site	Before site clearance	EIAO-TM
E2	Erection of hoarding, fencing or provision of clear demarcation of work zones	To minimize direct impact outside work boundary	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
Waste Management						
Construction Phase						
WM1	Allocate an area for waste sorting and storage of C&D materials into the following categories for reuse, recycle or disposal if possible. Remove waste from the Site for sorting once generated if no suitable space can be identified.	To minimize waste generation	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM
	- excavated material suitable for reuse					
	- inert C&D materials for reuse/disposal offsite					
	- non-inert C&D materials for disposal at landfills					
	- chemical waste					
	- general refuse					
WM2	Adopt good site practice as follows:	To proper handling of waste	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM
	- Provide training to workers on site cleanliness, waste management (waste reduction, reuse and recycle) and chemical handling procedures					
	- Provide sufficient waste collection points and regular removal					
	- Cover waste materials with tarpaulin or in enclosure during transportation					
	- Maintain drainage systems, sumps and oil interceptors					
	- Sort out chemical waste for proper handling and treatment onsite or offsite					
WM3	Adopt waste reduction measures as follows:	To minimize waste generation	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM
	- Allocate area/containers for sorting, recovering and storing waste for reuse, recycle or disposal (e.g. demolition debris and excavated materials, general refuse like aluminium cans). Remove waste from the Site for sorting once generated if no suitable space can be identified.					
	- Allocate area for proper storage of construction materials to prevent contamination					

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
WM4	Prepare and implement a site specific Waste Management Plan (WMP) as part of Environmental Management Plan (EMP) in accordance with ETWB TCW No. 19/25. Detail waste management method in the form of avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal according to the recommendations on the EIA and EM&A Manual. It should be approved by the ER and regularly reviewed.	To provide guidance to waste management	HyD's Contractor	Whole construction site	Throughout construction phase	ETWB TCW No. 19/2005, EIAO-TM
WM5	Store waste materials properly as follows: - Avoid contamination by proper handling and storing waste - Prevent erosion by covering waste - Maintain and clean storage area regularly - Sort and stockpile different materials at designated location to enhance reuse	To properly store waste	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
WM6	Apply for relevant waste disposal permits in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28).	To properly dispose waste	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28), Dumping at Sea Ordinance (Cap. 466), EIAO-TM
WM7	Implement trip-ticket system for recording the amount of waste generated, recycled and disposed, including chemical wastes	To monitor movement of waste	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal (Chemical Waste) (General) Regulation, Waste Disposal Ordinance, EIAO-TM
WM8	Reduce water content in wet spoil generated from piling work by mixing with dry materials. Only dispose treated spoil with less than 25% dry density to Public Fill Reception Facilities	To minimize load to reception facilities	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM
WM9	Dispose dry waste or waste with less than 70% water content by weight to landfill	To minimize load to reception facilities	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
WM10	Follow the *Code of Practice on the Packaging, Labelling and Storage of Chemical Waste* as follows: - Store chemical wastes with suitable containers. Seal and maintain the container to avoid leakage or spillage during storage, handling and transport - Label chemical waste containers in both English and Chinese with instructions in accordance to Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation - The container capacity should be smaller than 450 litres unless agreed by the EPD	To avoid accident in waste storage and handling	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM
W11	Comply with the requirement of the chemical storage area: - Store only chemical waste and label clearly the chemical characters of the waste - Have at least 3 sides enclosed and protected from rainfall with cover - Provide sufficient ventilation - Have impermeable floor and has bunds to contain 110% of the capacity of the largest container or 20% of the total volume of the stored waste in the area, whichever is larger - Adequately spaced incompatible materials	To ensure proper storage of chemical waste	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM
W12	Transfer used lubricants, waste oils and other chemicals to oil recycling companies, if possible, and empty oil drums for reuse or refill. No direct or indirect discharge is permitted	To ensure proper disposal of chemical waste	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal (Chemical Waste) (General) Regulation, EIAO-TM
W13	Hire licensed chemical waste disposal contractors for waste collection and removal. Dispose chemical waste at the approved CWTC at Tsing Yi or other licensed facility	To ensure proper disposal of chemical waste	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal (Chemical Waste) (General) Regulation, EIAO-TM
W14	Provide recycling bins for sorting out recyclables for collection by recycling companies. Non-recyclables should be removed to designated landfills every day by licensed collectors to prevent environmental and health nuisance.	To ensure proper recycling and disposal of general refuse	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM
W15	Terminate excavation work if contaminated soil is found. Prepare Land Contamination Plan (CAP) in accordance with EPD's Guidance Note for Contaminated Land Assessment and Remediation for identifying soil and groundwater sampling locations, followed by testing and remediation where necessary.	To identify presence of contaminated soil and provide proper remediation	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
W16	Marine sediment shall be cement solidified and and sent to laboratory for Toxicity Characteristics Leaching Procedure (TCLP) test according to USEPA Method 1311 and 6020. The results are considered satisfactory if Universal Treatment Standards (UTS) are being met as per Table 4.6 of Practice Guide of Investigation and Remediation of Contaminated Land. The Unconfined Compressive Strength (UCS) of the solidified sediment shall also reach 1000kPa according to the above Practice Guide.If the TCLP and UCS testing results cannot meet the criteria, the sediment shall be retreated by cement solidification. After passing the tests, the solidified sediment shall be backfilled on land after the piling work (e.g. for construction of new piers and abutments). Alternatively, the solidified sediment shall be delivered to public fill reception facilities for beneficial reuse as the last resort.	To prevent leakage of contaminants to water.	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM, Practice Guide of Investigation and Remediation of Contaminated Land

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
Landscape and Visual						
Construction Phase						
CM1	The construction area and contractor's temporary works areas should be minimised to avoid impacts on adjacent landscape. (Measure for mitigating Landscape and Visual impacts)	To minimise landscape footprint and reduce potential for visual impact	HyD's Contractor	Adjacent to existing bridge	Construction Phase	To approved Detailed Design and RLA's Approval
CM2	Reduction of construction period to practical minimum. (Measure for mitigating Visual impact)	To reduce duration of impacts	HyD's Contractor	N/A	Construction Phase	To approved Detailed Design and RLA's Approval
CM3	Construction traffic (land and sea) including construction plant, construction vessels and barges should be kept to a practical minimum. (Measure for mitigating Visual impact)	To minimise temporary visual impacts	HyD's Contractor	Connecting roads to site and Silver Mine Bay	Construction Phase	To approved Detailed Design and RLA's Approval
CM4	Erection of decorative mesh screens or construction hoardings around works areas in visually unobtrusive colours. (Measure for mitigating Visual impact)	To screen works sites and plant	HyD's Contractor	Around works areas	Construction Phase	To approved Detailed Design and RLA's Approval
CM5	Avoidance of excessive height and bulk of site buildings and structures. (Measure for mitigating Visual impact)	To reduce temporary visual impacts	HyD's Contractor	Within works sites	Construction Phase	To approved Detailed Design and RLA's Approval
CM6	Control of night-time lighting by hooding all lights and through minimisation of night working periods. (Measure for mitigating Visual impact)	To reduce temporary visual impacts	HyD's Contractor	Within works sites	Construction Phase	To approved Detailed Design and RLA's Approval

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
CM7	All existing trees shall be carefully protected before, during construction and after construction. A Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees or trees to be transplanted, including trees in contractor's works areas for approval by the Registered Landscape Architect (RLA). This method statement for tree protection and transplanting shall make reference to "Guidelines on Tree Preservation during Construction" and "Guidelines on Tree Transplanting" published by GLTM of the DEVB. Early preparation of trees to be transplanted shall be undertaken to increase their likely survival rate following transplanting. (Measure for mitigating Landscape impact)	To minimise tree impacts and maximise tree preservation	HyD's Contractor	Within and adjacent to works sites	Construction Phase	To approved Detailed Design and RLA's Approval
CM8	Minimisation of Impacts to Wang Tong River through minimised and carefully controlled dredging for pile/abutment removal/construction works. (Measure for mitigating Landscape impact)	To minimise contamination of Wang Tong River	HyD's Contractor	Wang Tong River	Construction Phase	To approved Detailed Design and RLA's Approval

Appendix 4.1

Action and Limit Level

Action and Limit Level

Action and Limit Level for Noise Monitoring

Monitoring Station ID	Time Period	Parameter	Action Level	Limit Level dB(A)
NMS1	0700-1900 hrs on normal weekdays	$L_{eq, 30min}$	When one documented complaint is received	75

Baseline Level for Noise Monitoring
(For reference and calculation of Construction Noise Levels (CNLs))

Monitoring Station ID	Monitoring Station	0700-1900 hrs on normal weekdays	
		$L_{eq (30min)}$, dB(A)	
		Average	Range
NMS1	1 Tung Wan Tau Road	60.1	52.7 – 64.4

Remark:

Each of daily 30-minute sampling period includes six consecutive $L_{eq (5min)}$ readings.

Due to free-field measurement, a correction factor of +3 dB(A) is adopted.

All the Construction Noise Levels (CNLs) reported in this report were adjusted with the corresponding baseline level (i.e. Measured Leq – Baseline Leq = CNL), in order to facilitate the interpretation of the noise exceedance.

Action and Limit Level for Air Quality Monitoring

Monitoring Station ID	1-hour TSP Level		24-hour TSP Level	
	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
AMS1	276.5	500.0	176.0	260.0
AMS2	283.7	500.0	176.0	260.0

Action and Limit Level for Water Monitoring

Monitoring Station	Depth	DO (mg/L) +		Turbidity (NTU) ~		SS (mg/L) ~	
		Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level
W1	Middle	6.5	5.3	7.7 NTU or 120% of upstream control station's turbidity at the same tide of the same day, whichever is higher	12.4 NTU or 130% of upstream control station's turbidity at the same tide of the same day, whichever is higher	8.9 mg/L or 120% of upstream control station's SS at the same tide of the same day, whichever is higher	11.3 mg/L or 130% of upstream control station's SS at the same tide of the same day, whichever is higher
W2							
W4							
W5	Middle	5.9	5.5	9.8 NTU or 120% of upstream control station's turbidity at the same tide of the same day, whichever is higher	10.5 NTU or 130% of upstream control station's turbidity at the same tide of the same day, whichever is higher	12.6 mg/L or 120% of upstream control station's SS at the same tide of the same day, whichever is higher	15.0 mg/L or 130% of upstream control station's SS at the same tide of the same day, whichever is higher
W6							
W7							
W8	Surface & Middle						
	Bottom	5.9	5.5				

Remarks +: For DO, non-compliance occurs when monitoring results is lower than the limits.
Remarks ~: For SS and Turbidity, non-compliance occurs when monitoring results is larger than the limits.

Appendix 4.2

Copies of Calibration Certificates

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
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Good Ba Ba Hitech Building, Nos. 22-24 Wing Kei Road, Kwai Chung, New Territories, Hong Kong
Tel: (852) 2873 6860 Fax: (852) 2555 7533 E-mail: smec@cigismec.com Website: www.cigismec.com

HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 21CA0326 03-02 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone
Manufacturer:	Larson Davis	,	PCB
Type/Model No.:	LxT1	,	377B02
Serial/Equipment No.:	0003737	,	171529
Adaptors used:	-	,	-

Item submitted by

Customer Name:	Lam Environmental Services Limited.
Address of Customer:	-
Request No.:	-
Date of receipt:	26-Mar-2021

Date of test: 31-Mar-2021

Reference equipment used in the calibration

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

Ambient conditions

Temperature:	21 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	1005 ± 5 hPa

Test specifications

1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.

2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of ±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 Junqi **Date:** 07-Apr-2021 **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. The results apply to the item as received.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港新界葵涌永基路22-24號好爸爸創科大廈
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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 21CA0326 03-02 **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 Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	0.8	2.1
	Lin	Pass	1.6	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: Fung Chi Yip **Date:** 31-Mar-2021

Checked by: Chan Yuk Yiu **Date:** 07-Apr-2021

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

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港新界葵涌永基路22-24號好爸爸創科大廈
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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 21CA0222 02-01 **Page** 1 **of** 2

Item tested

Description:	Sound Level Meter (Type 1)	,	Microphone	Preamp
Manufacturer:	Nti	,	Nti Andio	Nti Andio
Type/Model No.:	XL2	,	MC230A	MA220
Serial/Equipment No.:	A2A-15360-EO	,	A14232	6830
Adaptors used:	-	,		

Item submitted by

Customer Name:	Lam Environmental Services Limited.
Address of Customer:	-
Request No.:	-
Date of receipt:	22-Feb-2021

Date of test: 23-Feb-2021

Reference equipment used in the calibration

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

Ambient conditions

Temperature:	22 ± 1 °C
Relative humidity:	55 ± 10 %
Air pressure:	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 Junqi **Date:** 24-Feb-2021 **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. The results apply to the item as received.

綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.
香港新界葵涌永基路22-24號好爸爸創科大廈
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CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 21CA0222 02-01 **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 Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	0.8	2.1
	Lin	Pass	1.6	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: Tung Chi Yip **Date:** 23-Feb-2021

Checked by: Feng Junqi **Date:** 24-Feb-2021

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

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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

Certificate No.: 20CA1119 02-01 **Page:** 1 **of** 2

Item tested

Description:	Acoustical Calibrator (Class 1)
Manufacturer:	Larson Davis
Type/Model No.:	CAL200
Serial/Equipment No.:	13437
Adaptors used:	-

Item submitted by

Curstomer:	Lam Environmental Services Limited.
Address of Customer:	-
Request No.:	-
Date of receipt:	19-Nov-2020

Date of test: 20-Nov-2020

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	11-May-2021	SCL
Preamplifier	B&K 2673	2743150	03-Jun-2021	CEPREI
Measuring amplifier	B&K 2610	2346941	03-Jun-2021	CEPREI
Signal generator	DS 360	33873	19-May-2021	CEPREI
Digital multi-meter	34401A	US36087050	19-May-2021	CEPREI
Audio analyzer	8903B	GB41300350	18-May-2021	CEPREI
Universal counter	53132A	MY40003662	18-May-2021	CEPREI

Ambient conditions

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

Test specifications

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

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

SOILS & MATERIALS ENGINEERING COMPANY LTD. 綜合試驗有限公司

Approved Signatory: Feng Junqi **Date:** 21-Nov-2020 **Company Chop:**

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. The results apply to the item as received.

綜合試驗有限公司
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HOKLAS 028 CAL

CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 20CA1119 02-01 **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	93.66	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 = 0.013 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 = 1000.1 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 = 0.5%**

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: Fung Chi Yip **Date:** 20-Nov-2020

Checked by: Feng Junqi **Date:** 21-Nov-2020

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

Lam Environmental Services Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	AMS1	**Calbration Date**	:	9-Jul-21
Equipment no.	:	HVS020	**Calbration Due Date**	:	8-Sep-21

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	305.6	Kelvin	**Pressure, P_a**	1010	mmHg

Orifice Transfer Standard Information					
Equipment No.	**0005**	**Slope, m_c**	2.08877	**Intercept, bc**	-0.02270
Last Calibration Date	17-Jul-20	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	17-Jul-21	$= m_c \times Q_{std} + b_c$			

Calibration of TSP						
Calibration Point	**Manometer Reading H (inches of water)** (up)	(down)	(difference)	**Q_{std}** (m^3 / min.) **X-axis**	**Continuous Flow Recorder, W** (CFM)	**IC** $(W(P_a/1013.3 \times 298/T_a)^{1/2}/35.31)$ **Y-axis**
1	1.1	1.1	2.2	0.7109	35	34.5057
2	1.8	1.8	3.6	0.9064	43	42.3927
3	2.6	2.6	5.2	1.0872	50	49.2939
4	3.4	3.4	6.8	1.2417	54	53.2374
5	4.1	4.1	8.2	1.3624	61	60.1386

By Linear Regression of Y on X

Slope, m = 37.8011 Intercept, b = 7.7793

Correlation Coefficient* = 0.9958

Calibration Accepted = Yes/~~No~~**

* if Correlation Coefficient < 0.990, check and recalibration again.

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Sam Lam	**Checked by**	:	James Chu
Date	:	9-Jul-21	**Date**	:	9-Jul-21

Lam Environmental Services Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	AMS1	**Calbration Date**	:	7-Sep-21
Equipment no.	:	HVS020	**Calbration Due Date**	:	7-Nov-21

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	303.1	Kelvin	**Pressure, P_a**	1010	mmHg

Orifice Transfer Standard Information					
Equipment No.	**3166**	**Slope, m_c**	1.88375	**Intercept, bc**	0.03970
Last Calibration Date	3-Aug-21	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	3-Aug-22	$= m_c \times Q_{std} + b_c$			

Calibration of TSP						
Calibration Point	**Manometer Reading H (inches of water)**			**Q_{std}** (m^3 / min.)	**Continuous Flow Recorder, W**	**IC** $(W(P_a/1013.3 \times 298/T_a)^{1/2}/35.31)$
	(up)	(down)	(difference)	**X-axis**	(CFM)	**Y-axis**
1	1.2	1.2	2.4	0.7932	40	39.6053
2	1.9	1.9	3.8	1.0035	46	45.5460
3	3.0	3.0	6.0	1.2664	52	51.4868
4	4.0	4.0	8.0	1.4656	57	56.4375
5	5.0	5.0	10.0	1.6411	61	60.3980

By Linear Regression of Y on X

Slope, m = 24.3271 Intercept, b = 20.6759

Correlation Coefficient* = 0.9993

Calibration Accepted = Yes/~~No~~**

* if Correlation Coefficient < 0.990, check and recalibration again.

** Delete as appropriate.

Remarks :

Calibrated by	:	Henry Lau	**Checked by**	:	James Chu
Date	:	7-Sep-21	**Date**	:	7-Sep-21

Lam Environmental Services Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	AMS2	**Calbration Date**	:	9-Jul-21
Equipment no.	:	HVS019	**Calbration Due Date**	:	8-Sep-21

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	305.6	Kelvin	**Pressure, P_a**	1010	mmHg

Orifice Transfer Standard Information					
Equipment No.	**0005**	**Slope, m_c**	2.08877	**Intercept, bc**	-0.02270
Last Calibration Date	17-Jul-21	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	17-Jul-22	$= m_c \times Q_{std} + b_c$			

Calibration of TSP						
Calibration Point	**Manometer Reading H (inches of water)**			**Q_{std}** (m^3 / min.)	**Continuous Flow Recorder, W**	**IC** $(W(P_a/1013.3 \times 298/T_a)^{1/2}/35.31)$
	(up)	(down)	(difference)	**X-axis**	(CFM)	**Y-axis**
1	1.1	1.1	2.2	0.7109	34	33.5198
2	1.4	1.4	2.8	0.8007	39	38.4492
3	2.7	2.7	5.4	1.1077	48	47.3221
4	3.5	3.5	7.0	1.2596	54	53.2374
5	4.5	4.5	9.0	1.4268	60	59.1527

By Linear Regression of Y on X

Slope, m = 34.5700 Intercept, b = 9.6523

Correlation Coefficient* = 0.9975

Calibration Accepted = Yes/~~No~~**

* if Correlation Coefficient < 0.990, check and recalibration again.

** Delete as appropriate.

Remarks : _____

Calibrated by	:	Sam Lam	**Checked by**	:	James Chu
Date	:	9-Jul-21	**Date**	:	9-Jul-21

Lam Environmental Services Limited

Calibration Data for High Volume Sampler (TSP Sampler)

Location	:	AMS2	**Calbration Date**	:	7-Sep-21
Equipment no.	:	HVS019	**Calbration Due Date**	:	7-Nov-21

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Temperature, T_a	303.1	Kelvin	**Pressure, P_a**	1010	mmHg

Orifice Transfer Standard Information					
Equipment No.	**3166**	**Slope, m_c**	1.88375	**Intercept, bc**	0.03970
Last Calibration Date	3-Aug-21	$(H \times P_a / 1013.3 \times 298 / T_a)^{1/2}$			
Next Calibration Date	3-Aug-22	$= m_c \times Q_{std} + b_c$			

Calibration of TSP						
Calibration Point	**Manometer Reading H (inches of water)**			**Q_{std}** (m^3 / min.)	**Continuous Flow Recorder, W**	**IC** $(W(P_a/1013.3 \times 298/T_a)^{1/2}/35.31)$
	(up)	(down)	(difference)	**X-axis**	(CFM)	**Y-axis**
1	1.6	1.6	3.2	0.9192	34	33.6645
2	2.5	2.5	5.0	1.1542	41	40.5954
3	3.7	3.7	7.4	1.4088	50	49.5066
4	4.6	4.6	9.2	1.5732	54	53.4671
5	5.7	5.7	11.4	1.7536	59	58.4177

By Linear Regression of Y on X

Slope, m = 30.0186 Intercept, b = 6.2510

Correlation Coefficient* = 0.9984

Calibration Accepted = Yes/~~No~~**

* if Correlation Coefficient < 0.990, check and recalibration again.

** Delete as appropriate.

Remarks :

Calibrated by	:	Henry Lau	**Checked by**	:	James Chu
Date	:	7-Sep-21	**Date**	:	7-Sep-21

Met One Instruments
1600 Washington Blvd
Grants Pass, OR 97526
(541) 471-7111
(541) 471-7116 (Fax)
Service@metone.com

Calibration Certificate

The calibration results on this report certify that this instrument complies with the product specifications at the time of calibration. Calibration was performed according to accepted industry methods using equipment, procedures, and standards that are traceable to NIST and ISO.

Recommended calibration interval is 12 months from the first day of use.

Instrument Model# *Aerocet 831* **Instrument Serial#** *W15448*

Date of Calibration *10/12/2020* **Sensor #** *16438*

J. Chester AT1
Calibration Technician

AT13 OCT 14 2020
Quality Check

Temperature *22* °C **Relative Humidity** *52* %

Test Procedure: *Aerocet 831-6100*

PSL Size (µm)	Test Results	Test Spec.	Lot# NIST	Expiration
0.3	Pass	± 10%	223077	04/30/2023
0.5	Pass	± 10%	219480	11/30/2022
1.0	Pass	± 10%	193291	1/31/2021
2.5	Pass	± 10%	REF	NA
4.0	Pass	± 10%	REF	NA
5.0	Pass	± 10%	REF	NA
7.0	Pass	± 10%	REF	NA
10.0	Pass	± 10%	REF	NA

Standards	Model	SN	Cal Due
Flowmeter	DCL-M	103751	2/14/2021
DMM	287	40900121	2/11/2021
RH/TEMP SENSOR	083E-1-35	U20080	11/11/2020
Particle Counter	GT-526S	X17421	11/29/2020

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Instrument Model# Aerocet 831 **Instrument Serial#** W15448

Date of comparison against standard 10-12-2020 **Sensor #** 16438

Quality Control Technician J. Chester AT

Temperature 22 °C **Relative Humidity** 51 %

Test Procedure: Aerocet 831-6100

As Received	Value	Range	Condition
Zero Count	0	Less than 5 particles in 5 min.	PASS
Air Flow	.09425	.092 to .108 CFM	PASS

PSL Size Micron	LOT# NIST	As Received PSL Count Comparison	Allowable PSL Count Comparison	Allowable Size Accuracy	As Received Condition
0.3	223077	150.06	10% to 90%	+/- 10 %	FAIL
0.5	219480	37.76	10% to 90%	+/- 10 %	PASS
1.0	193291	27.30	10% to 90%	+/- 10 %	PASS

Standards	Model	SN	Cal Due
Flowmeter	DCL-M	103751	2/14/2021
DMM	287	40900121	2/11/2021
RH/TEMP SENSOR	083E-1-35	U20080	11/11/2020
Particle Counter	GT-526S	X17421	11/29/2020

Calibration was performed by direct comparison to a count standard.

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Calibration Certificate

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Recommended calibration interval is 12 months from the first day of use.

Instrument Model# *Aerocet 831* **Instrument Serial#** *W15449*

Date of Calibration *4/29/2021* **Sensor #** *16439*

Jason Gist AT14 — Calibration Technician

AT5 — Quality Check

Temperature *23* °C **Relative Humidity** *35* %

Test Procedure: *Aerocet 831-6100*

PSL Size (µm)	Test Results	Test Spec.	Lot# NIST	Expiration
0.3	Pass	± 10%	223077	04/30/2023
0.5	Pass	± 10%	219480	11/30/2022
1.0	Pass	± 10%	229294	8/31/2023
2.5	Pass	± 10%	REF	NA
4.0	Pass	± 10%	REF	NA
5.0	Pass	± 10%	REF	NA
7.0	Pass	± 10%	REF	NA
10.0	Pass	± 10%	REF	NA

Standards	Model	SN	Cal Due
Dry Cal	Defender 530+	170092	2/9/2022
DMM	289	27720071	7/31/2021
RH/TEMP SENSOR	083E-1-6	R20313	9/17/2021
Particle Counter	GT-526	M1761	8/26/2021

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Instrument Model# Aerocet 831 **Instrument Serial#** W15449

Date of comparison against standard 4-27-2021 **Sensor #** 16439

Quality Control Technician Jason Gist AT14

Temperature 23 °C **Relative Humidity** 32 %

Test Procedure: Aerocet 831-6100

As Received	Value	Range	Condition
Zero Count	0	Less than 5 particles in 5 min.	PASS
Air Flow	.08916	.092 to .108 CFM	FAIL

PSL Size Micron	LOT# NIST	As Received PSL Count Comparison	Allowable PSL Count Comparison	Allowable Size Accuracy	As Received Condition
0.3	223077	48.87	10% to 90%	+/- 10 %	PASS
0.5	219480	48.71	10% to 90%	+/- 10 %	PASS
1.0	229294	48.09	10% to 90%	+/- 10 %	PASS

Standards	Model	SN	Cal Due
Dry Cal	Defender 530+	170092	2/9/2022
DMM	289	23700150	5/4/2021
RH/TEMP SENSOR	083E-1-6	R20313	9/17/2021
Particle Counter	GT-526	M1761	8/26/2021

Calibration was performed by direct comparison to a count standard.

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Calibration Certificate

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Recommended calibration interval is 12 months from the first day of use.

Instrument Model# *Aerocet 831* **Instrument Serial#** *W16848*

Date of Calibration *12/3/2020* **Sensor #** *16574*

Jason Gist AT14
Calibration Technician

AT21 DEC 07 2020
Quality Check

Temperature *23* °C **Relative Humidity** *28* %

Test Procedure: *Aerocet 831-6100*

PSL Size (µm)	Test Results	Test Spec.	Lot# NIST	Expiration
0.3	Pass	± 10%	223077	04/30/2023
0.5	Pass	± 10%	219480	11/30/2022
1.0	Pass	± 10%	193291	1/31/2021
2.5	Pass	± 10%	REF	NA
4.0	Pass	± 10%	REF	NA
5.0	Pass	± 10%	REF	NA
7.0	Pass	± 10%	REF	NA
10.0	Pass	± 10%	REF	NA

Standards	Model	SN	Cal Due
Dry Cal	Defender 530+	170092	1/28/2021
DMM	289	23700150	5/4/2021
RH/TEMP SENSOR	083E-1-6	R20313	9/17/2021
Particle Counter	GT-526S	X17420	12/20/2020

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Instrument Model# Aerocet 831 **Instrument Serial#** W16848

Date of comparison against standard 12-2-2020 **Sensor #** 16574

Quality Control Technician Jason Gist AT14

Temperature 23 °C **Relative Humidity** 29 %

Test Procedure: Aerocet 831-6100

As Received	Value	Range	Condition
Zero Count	0	Less than 5 particles in 5 min.	PASS
Air Flow	.09915	.092 to .108 CFM	PASS

PSL Size Micron	LOT# NIST	As Received PSL Count Comparison	Allowable PSL Count Comparison	Allowable Size Accuracy	As Received Condition
0.3	223077	47.13	10% to 90%	+/- 10 %	PASS
0.5	219480	51.49	10% to 90%	+/- 10 %	PASS
1.0	193291	40.68	10% to 90%	+/- 10 %	PASS

Standards	Model	SN	Cal Due
Dry Cal	Defender 530+	170092	1/28/2021
DMM	289	23700150	5/4/2021
RH/TEMP SENSOR	083E-1-6	R20313	9/17/2021
Particle Counter	GT-526S	X17420	12/20/2020

Calibration was performed by direct comparison to a count standard.

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Calibration Certificate

The calibration results on this report certify that this instrument complies with the product specifications at the time of calibration. Calibration was performed according to accepted industry methods using equipment, procedures, and standards that are traceable to NIST and ISO.

Recommended calibration interval is 12 months from the first day of use.

Instrument Model# *Aerocet 831* **Instrument Serial#** *Y23153*

Date of Calibration *12/3/2020* **Sensor #** *19493*

Jason Gist AT14 AT21 DEC 07 2020

Calibration Technician **Quality Check**

Temperature *23* °C **Relative Humidity** *28* %

Test Procedure: *Aerocet 831-6100*

PSL Size (µm)	Test Results	Test Spec.	Lot# NIST	Expiration
0.3	Pass	± 10%	223077	04/30/2023
0.5	Pass	± 10%	219480	11/30/2022
1.0	Pass	± 10%	193291	1/31/2021
2.5	Pass	± 10%	REF	NA
4.0	Pass	± 10%	REF	NA
5.0	Pass	± 10%	REF	NA
7.0	Pass	± 10%	REF	NA
10.0	Pass	± 10%	REF	NA

Standards	Model	SN	Cal Due
Dry Cal	Defender 530+	170092	1/28/2021
DMM	289	23700150	5/4/2021
RH/TEMP SENSOR	083E-1-6	R20313	9/17/2021
Particle Counter	GT-526S	X17420	12/20/2020

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Calibration Certificate

As Received

This certificate documents the as received condition of your instrument. Calibration was verified using accepted industry methods, equipment, procedures and standards that are traceable to NIST and ISO.

Instrument Model# Aerocet 831 **Instrument Serial#** Y23153

Date of comparison against standard 12-2-2020 **Sensor #** 19493

Quality Control Technician Jason Gist

Temperature 23 °C **Relative Humidity** 29 %

Test Procedure: Aerocet 831-6100

As Received	Value	Range	Condition
Zero Count	0	Less than 5 particles in 5 min.	PASS
Air Flow	.09044	.092 to .108 CFM	FAIL

PSL Size Micron	LOT# NIST	As Received PSL Count Comparison	Allowable PSL Count Comparison	Allowable Size Accuracy	As Received Condition
0.3	223077	57.69	10% to 90%	+/- 10 %	PASS
0.5	219480	30.82	10% to 90%	+/- 10 %	PASS
1.0	193291	19.68	10% to 90%	+/- 10 %	PASS

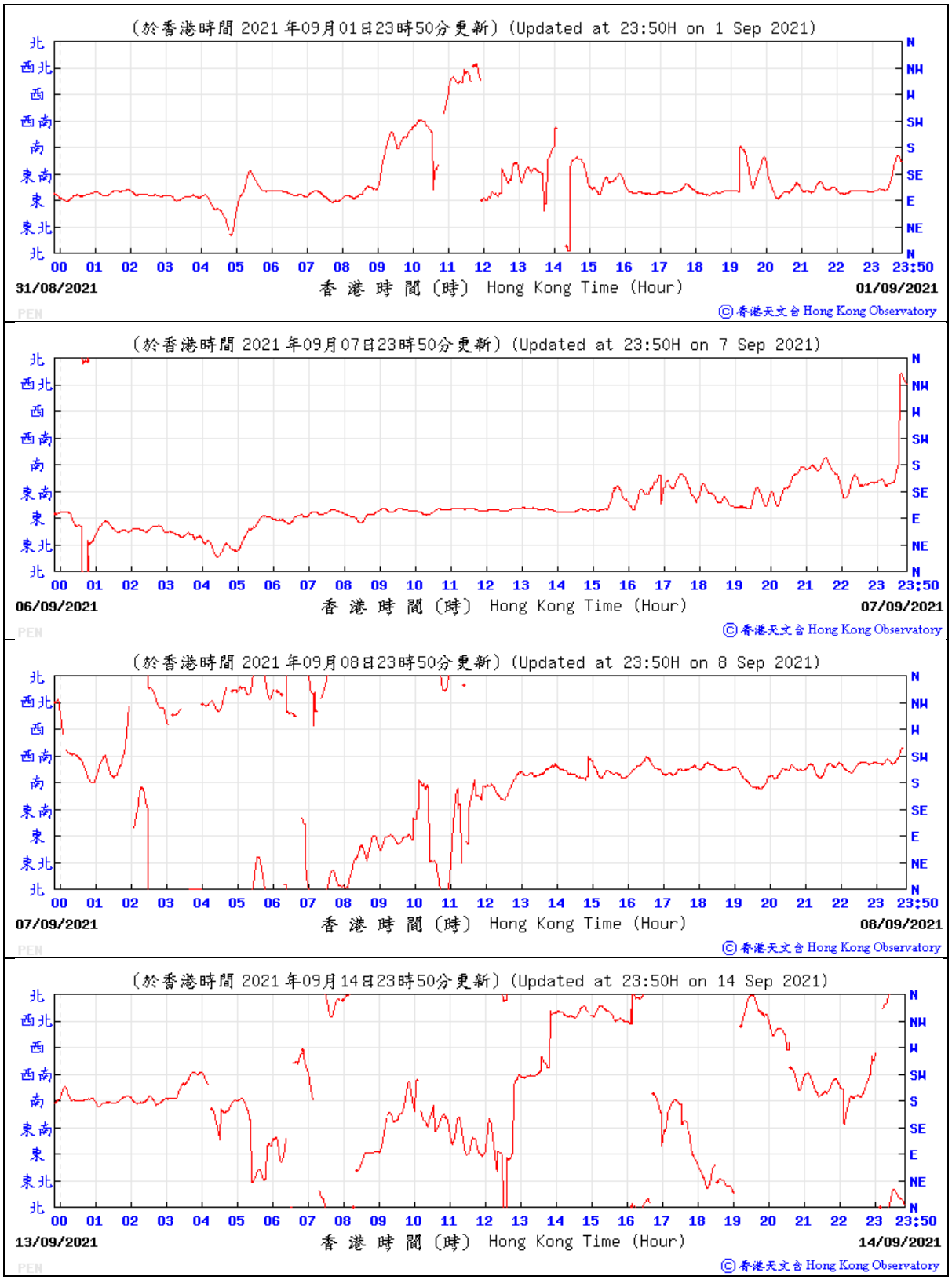
Standards	Model	SN	Cal Due
Dry Cal	Defender 530+	170092	1/28/2021
DMM	289	23700150	5/4/2021
RH/TEMP SENSOR	083E-1-6	R20313	9/17/2021
Particle Counter	GT-526S	X17420	12/20/2020

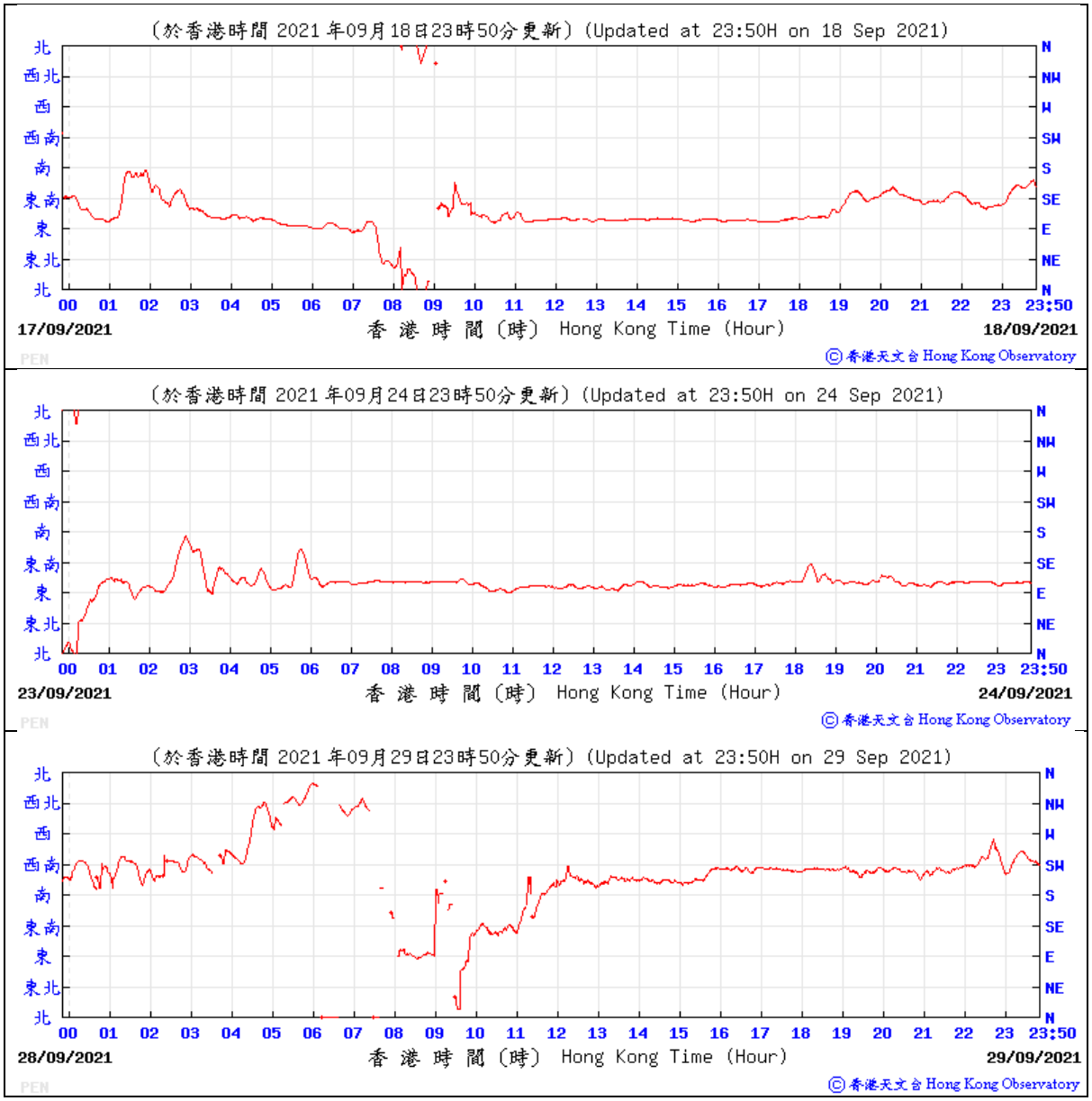
Calibration was performed by direct comparison to a count standard.

Appendix 4.3

Wind data extracted from HKO Automatic Weather Station

A. Wind Direction extracted from Peng Chau Automatic Weather Station

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N NW W SW S SE E NE N
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 23:50
17/09/2021
香 港 時 間 (時) Hong Kong Time (Hour)
18/09/2021
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(於香港時間 2021 年09月24日23時50分更新) (Updated at 23:50H on 24 Sep 2021)
北 西北 西 西南 南 東南 東 東北 北
N NW W SW S SE E NE N
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 23:50
23/09/2021
香 港 時 間 (時) Hong Kong Time (Hour)
24/09/2021
© 香港天文台 Hong Kong Observatory
(於香港時間 2021 年09月29日23時50分更新) (Updated at 23:50H on 29 Sep 2021)
北 西北 西 西南 南 東南 東 東北 北
N NW W SW S SE E NE N
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 23:50
28/09/2021
香 港 時 間 (時) Hong Kong Time (Hour)
29/09/2021
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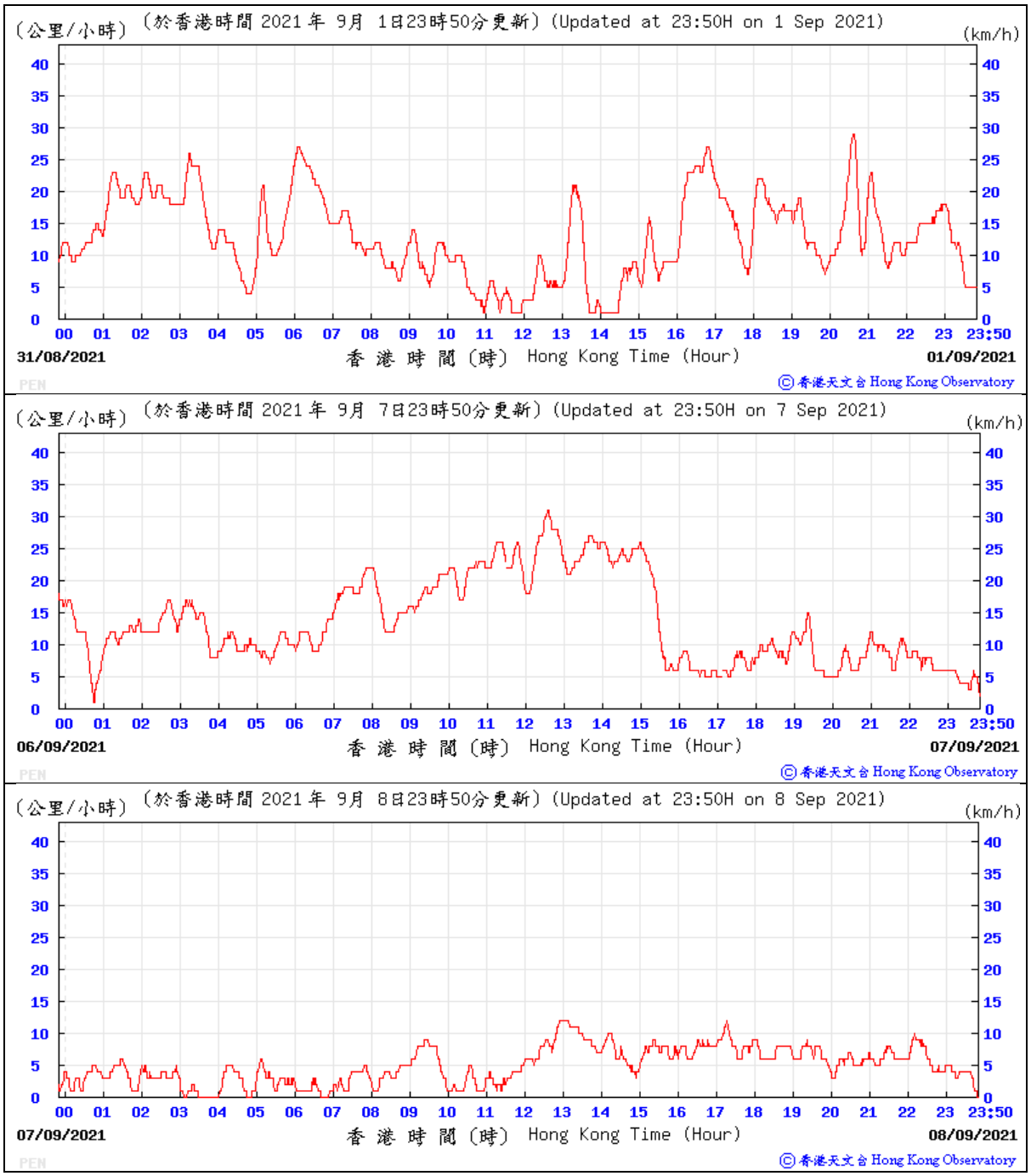
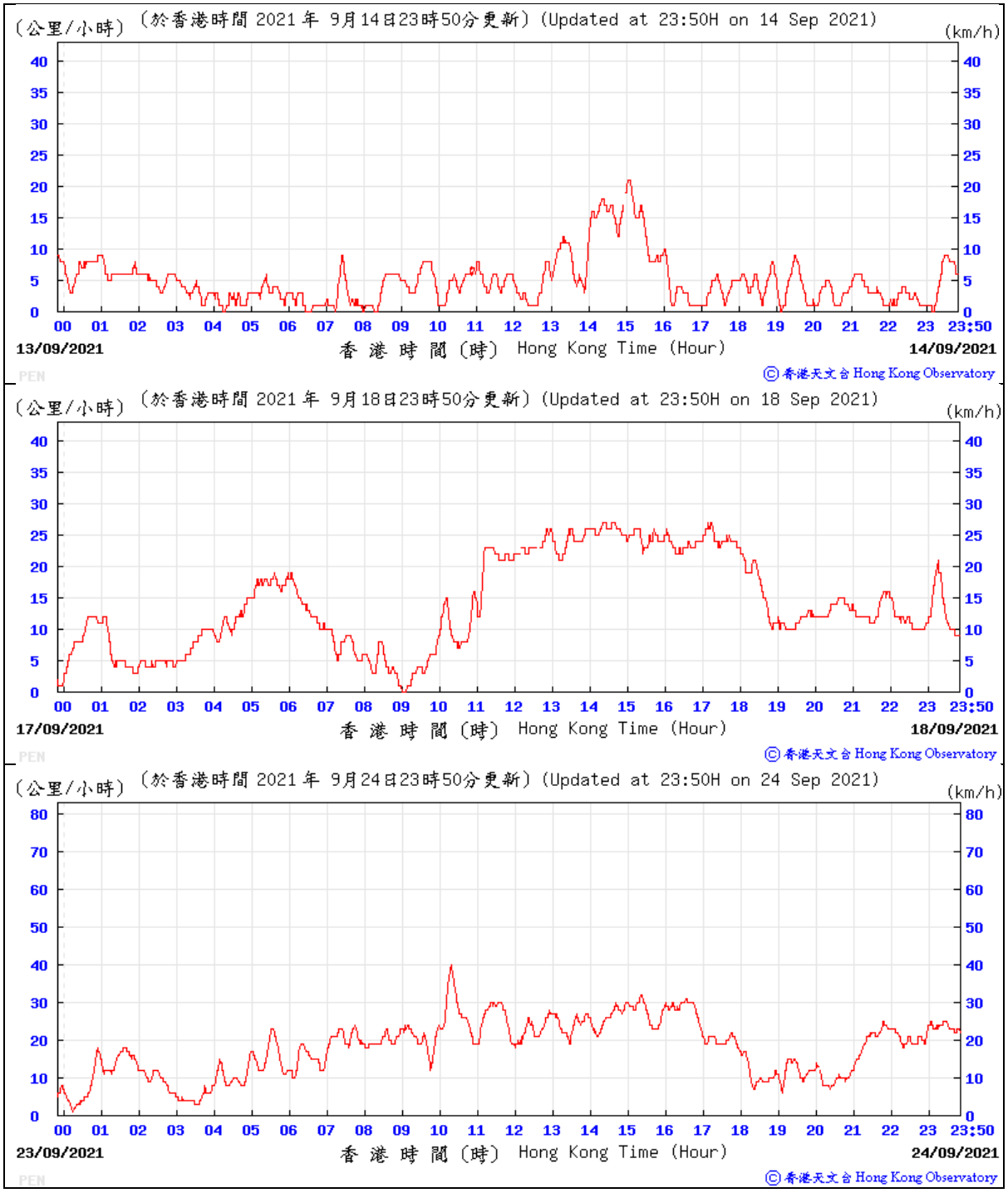
B. Wind Speed extracted from Peng Chau Automatic Weather Station

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(km/h)
13/09/2021
香 港 時 間 (時) Hong Kong Time (Hour)
14/09/2021
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(公里/小時) (於香港時間 2021 年 9月18日23時50分更新) (Updated at 23:50H on 18 Sep 2021)
(km/h)
17/09/2021
香 港 時 間 (時) Hong Kong Time (Hour)
18/09/2021
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(公里/小時) (於香港時間 2021 年 9月24日23時50分更新) (Updated at 23:50H on 24 Sep 2021)
(km/h)
23/09/2021
香 港 時 間 (時) Hong Kong Time (Hour)
24/09/2021
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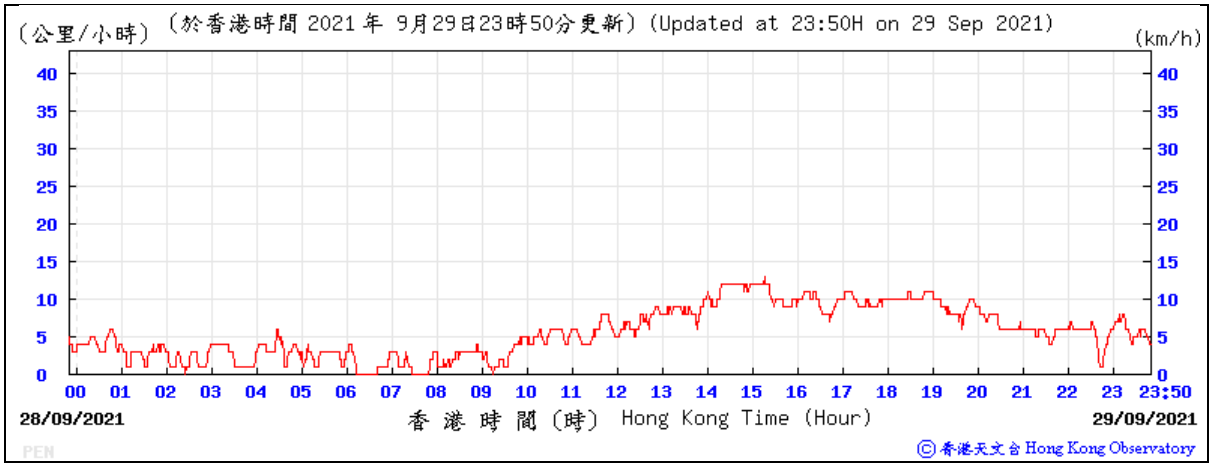
Appendix 4.3 Wind Data



Appendix 5.1

Monitoring Schedules for Reporting Month

Contract No. HY/2019/14
New Wang Tong River Bridge

Tentative Impact Air Quality, Noise and Water Quality Monitoring Schedule
Sep 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
29 Aug	30 Aug	31 Aug	01 Sep 24-hr TSP	02 Sep 1-hr TSP NM	03 Sep	04 Sep
05 Sep	06 Sep	07 Sep 24-hr TSP	08 Sep 24-hr TSP 1-hr TSP NM	09 Sep	10 Sep	11 Sep
12 Sep	13 Sep	14 Sep 24-hr TSP 1-hr TSP NM	15 Sep	16 Sep	17 Sep	18 Sep 24-hr TSP
19 Sep	20 Sep 1-hr TSP NM	21 Sep	22 Sep	23 Sep	24 Sep 24-hr TSP	25 Sep 1-hr TSP NM
26 Sep	27 Sep	28 Sep	29 Sep 24-hr TSP	30 Sep 1-hr TSP NM	01 Oct	02 Oct

Remark:

24-hr TSP stands for 24-hour Total Suspended Particulates Monitoring;

1-hr TSP stands for 1-hour Total Suspended Particulate Monitoring;

NM stands for Noise Monitoring; and

WQM stands for Water Quality Monitoring, which commencement date will be subject to cofferdam construction works.

Contract No. HY/2019/14
New Wang Tong River Bridge

Tentative Impact Air Quality, Noise and Water Quality Monitoring Schedule
Oct 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26 Sep	27 Sep	28 Sep 24-hr TSP	29 Sep 1-hr TSP NM	30 Sep	01 Oct	02 Oct
03 Oct	04 Oct 24-hr TSP	05 Oct 1-hr TSP NM	06 Oct	07 Oct	08 Oct	09 Oct 24-hr TSP
10 Oct	11 Oct 1-hr TSP NM	12 Oct	13 Oct	14 Oct	15 Oct 24-hr TSP	16 Oct 1-hr TSP NM
17 Oct	18 Oct	19 Oct	20 Oct	21 Oct 24-hr TSP	22 Oct 1-hr TSP NM	23 Oct
24 Oct	25 Oct	26 Oct	27 Oct 24-hr TSP	28 Oct 1-hr TSP NM	29 Oct	30 Oct

Remark:

24-hr TSP stands for 24-hour Total Suspended Particulates Monitoring;

1-hr TSP stands for 1-hour Total Suspended Particulate Monitoring;

NM stands for Noise Monitoring; and

WQM stands for Water Quality Monitoring, which commencement date will be subject to cofferdam construction works.

Appendix 5.2

Noise Monitoring Results and Graphical Presentations

Noise Monitoring Result

Day Time (0700 - 1900hrs on normal weekdays)

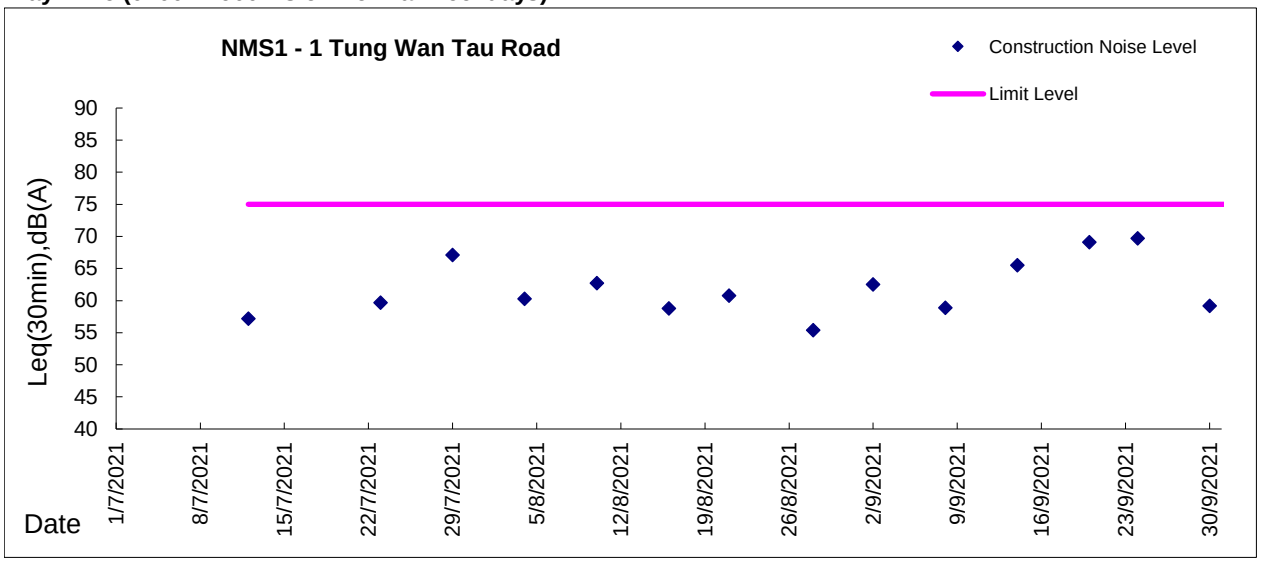
Location: NMS1 - 1 Tung Wan Tau Road

Date	Weather	Time	Measurement Noise Level			Average Noise Level#	Baseline Level	Construction Noise Level	Limit Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}	L_{eq}	L_{eq}
			Unit: dB(A), (30-min)			Unit: dB(A), (30-min)			
2 Sep 2021	Fine	14:07	62.5	62.9	48.6	62.5	60.1	58.8	75
8 Sep 2021	Fine	13:06	58.9	61.1	50.2	58.9	60.1	<Baseline Level	75
14 Sep 2021	Fine	8:45	65.5	67.6	51.7	65.5	60.1	64.0	75
20 Sep 2021	Fine	13:44	69.1	69.8	67.1	69.1	60.1	68.5	75
24 Sep 2021	Fine	10:00	69.7	70.8	64.8	70	60.1	69	70
30 Sep 2021	Fine	8:53	59.2	62.0	48.9	59	60.1	<Baseline Level	70

Remark:
Due to free-field measurement, a correction factor of +3 dB(A) is adopted.

Graphic Presentation of Noise Monitoring Result

Day Time (0700 - 1900hrs on normal weekdays)



Appendix 5.3

Air Quality Monitoring Results and Graphical Presentations

Report on 1-hour TSP monitoring at AMS1 - Slivermine Beach Resort

Limit Level (μg/m^3) - 500.0

Date	Weather Condition	Time	TSP Level (μg/m^3)
2-Sep-21	Fine	9:41	9.4
2-Sep-21	Fine	10:42	6.7
2-Sep-21	Fine	13:00	5.1
8-Sep-21	Fine	13:00	20.9
8-Sep-21	Fine	14:01	27.3
8-Sep-21	Fine	15:02	29.3
14-Sep-21	Fine	8:45	43.2
14-Sep-21	Fine	9:46	31.2
14-Sep-21	Fine	10:47	15.6
20-Sep-21	Fine	13:00	11.5
20-Sep-21	Fine	14:01	14.7
20-Sep-21	Fine	15:02	17.3
25-Sep-21	Fine	9:56	37.6
25-Sep-21	Fine	10:57	34.4
25-Sep-21	Fine	13:00	29.8
30-Sep-21	Fine	8:36	37.1
30-Sep-21	Fine	9:37	38.0
30-Sep-21	Fine	10:38	37.2

Report on 1-hour TSP monitoring at AMS2 - 1 Tung Wan Tau Road
Limit Level (μg/m^3) - 500.0

Date	Weather Condition	Time	TSP Level (μg/m^3)
2-Sep-21	Fine	9:32	40.1
2-Sep-21	Fine	10:33	21.4
2-Sep-21	Fine	13:00	18.3
8-Sep-21	Fine	13:00	14.8
8-Sep-21	Fine	14:01	17.4
8-Sep-21	Fine	15:02	14.5
14-Sep-21	Fine	8:42	54.6
14-Sep-21	Fine	9:43	50.4
14-Sep-21	Fine	10:44	53.1
20-Sep-21	Fine	13:05	86.6
20-Sep-21	Fine	14:06	31.6
20-Sep-21	Fine	15:07	30.3
25-Sep-21	Fine	9:58	87.1
25-Sep-21	Fine	10:59	87.8
25-Sep-21	Fine	13:00	58.9
30-Sep-21	Fine	8:55	137.1
30-Sep-21	Fine	9:56	110.4
30-Sep-21	Fine	10:57	110.7

lam

Contract No. HY/2019/04

New Wang Tong River Bridge

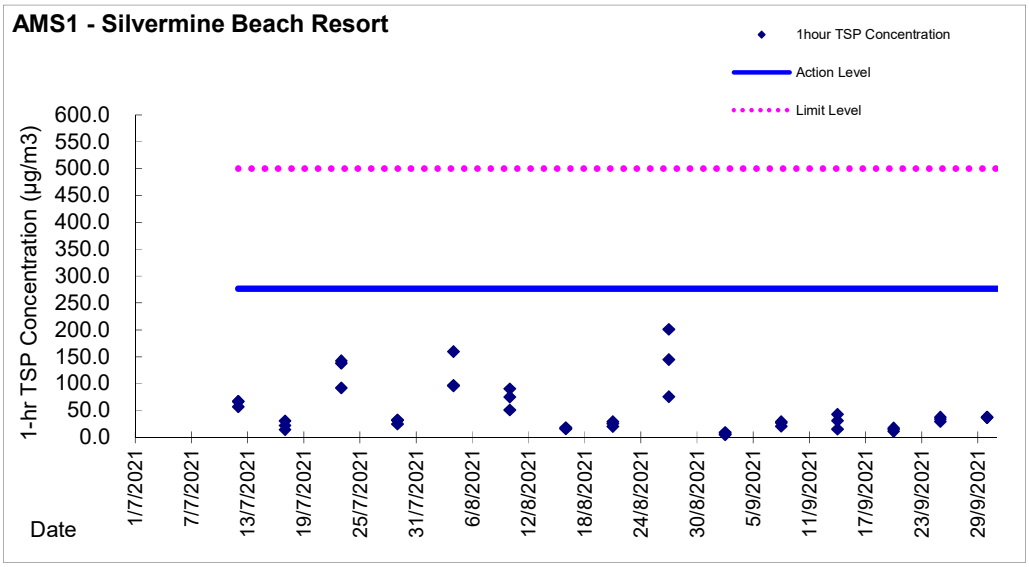
	Date	Sampling Time	Weather Condition	Filter paper no.	Filter Weight, g		Elapse Time, hr		Sampling	Flow Rate, m^3/min			Total	TSP Level,
					Initial	Final	Initial	Final	Time, hr	Initial, Qsi	Final, Qsf	Average	Volume, m^3	$\mu g/m^3$
AMS1	08/09/21	13:00	Fine	5429	2.6677	2.7208	928.68	952.68	24.00	0.32	0.91	0.61	885	60.0
	14/09/21	8:00	Fine	5426	2.6728	2.6962	974.96	998.96	24.00	0.33	0.17	0.25	360	65.1
	18/09/21	8:00	Fine	5457	2.6779	2.7527	998.99	1022.99	24.00	0.29	1.11	0.70	1008	74.2
	24/09/21	8:00	Fine	5482	2.7089	2.7538	1023.04	1047.04	24.00	0.31	0.40	0.36	512	87.7
	29/09/21	8:00	Fine	5483	2.6901	2.7818	1047.04	1071.04	24.00	0.33	0.95	0.64	919	99.7
AMS2	01/09/21	8:00	Fine	5422	2.7045	2.7470	1409.98	1433.98	24.00	1.21	1.22	1.22	1752	24.3
	07/09/21	8:00	Fine	5425	2.6881	2.7670	1433.98	1457.98	24.00	1.56	1.56	1.56	2249	35.1
	14/09/21	8:00	Fine	5428	2.6732	2.7429	1480.89	1504.89	24.00	1.60	1.44	1.52	2189	31.8
	18/09/21	8:00	Fine	5427	2.6875	2.7541	1504.89	1528.89	24.00	1.12	1.13	1.12	1615	41.2
	24/09/21	8:00	Fine	5481	2.7059	2.7811	1528.89	1552.89	24.00	1.63	1.63	1.63	2349	32.0
	29/09/21	8:00	Fine	5484	2.7094	2.8254	1552.89	1576.89	24.00	1.59	1.50	1.55	2226	52.1

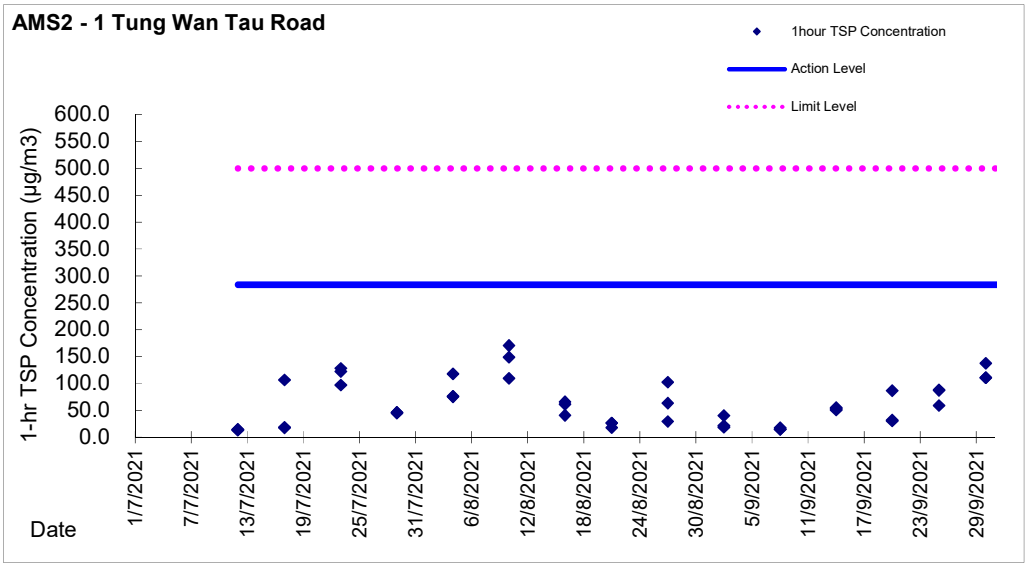
Remarks: Due to power interruption, AMS1 24-hr TSP monitoring was suspended on 01 September 2021

Due to power interruption, AMS1 24-hr TSP monitoring was rescheduled from 07 September 2021 to 08 September 2021.

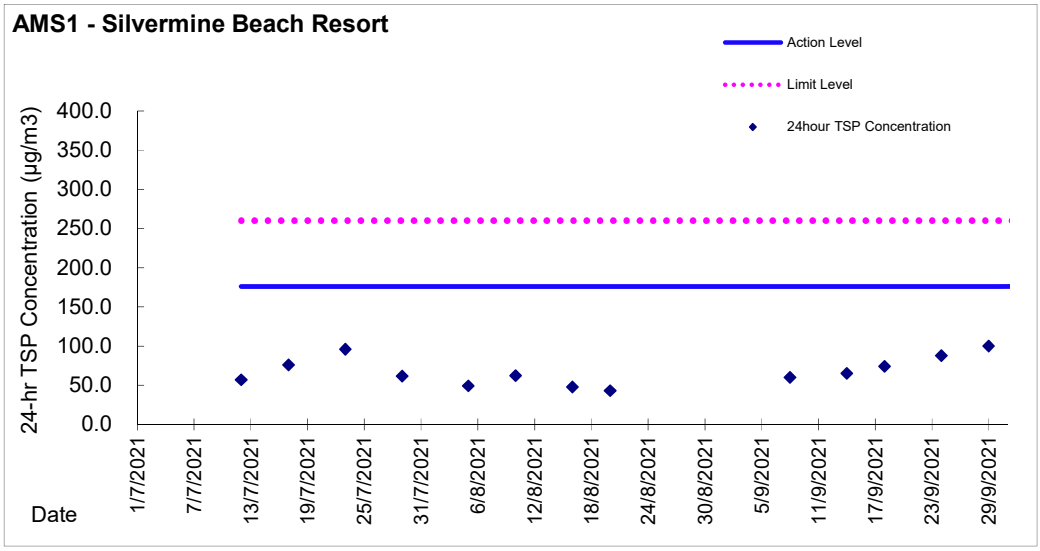
Due to power interruption, AMS1 and AMS2 24-hr TSP monitoring were rescheduled from 13 September 2021 to 14 September 2021.

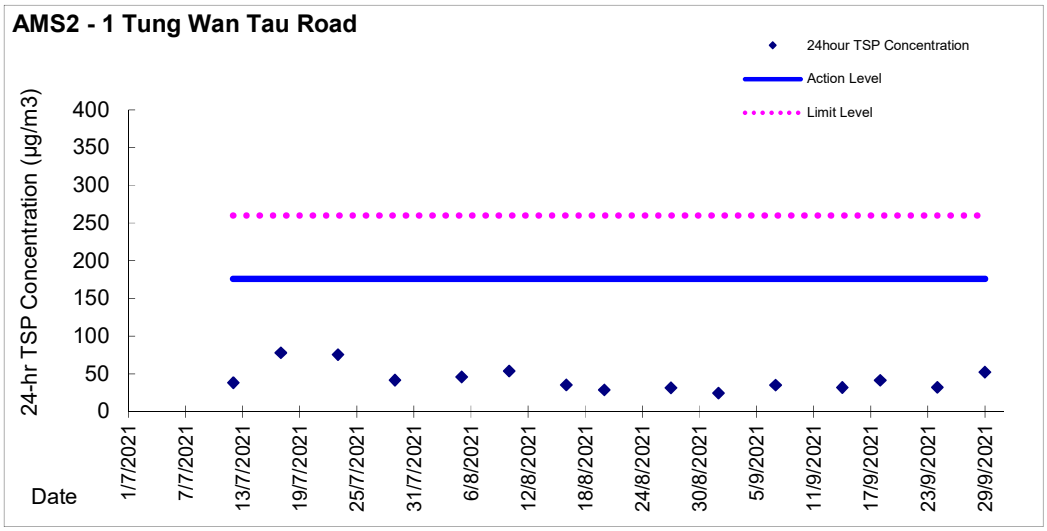
Graphic Presentation of TSP Result





Graphic Presentation of TSP Result





Appendix 5.4

Water Quality Monitoring Results and Graphical Presentations

Water Quality Monitoring Data

Due to no marine-based construction works in the reporting period, no water quality monitoring was conducted. Thus, no water quality monitoring data is presented.

Appendix 5.5

Monthly Summary Waste Flow Table

Name of Department: ~~ArchSD/CEDD/~~HA~~/EMSD/~~HyD~~/WSD~~ Contract No.: HY/2019/14

(Notes: The following Waste Flow Table should be used for contracts either not included under the Pay for Safety and Environment Scheme or exempted from the full requirement for environmental management)

Monthly Summary Waste Flow Table for 2021

Monthly ending	Actual Quantities of Inert C&D Materials Generated						Actual Quantities of C&D Wastes Generated				
	Total Quantity Generated	Broken Concrete (see Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in'000 kg)	(in'000 kg)	(in'000 kg)	(in'000 kg)	(in'000m^3)
Jan	0	0	0	0	0	0	0	0	0	0	0
Feb	0	0	0	0	0	0	0	0	0	0	0
Mar	0.014	0.007	0	0	0	0	0	0	0	0	0.007
Apr	0	0	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0	0	0
Jun	0.01	0	0	0	0	0	0	0	0.03	0	0.007
Sub Total	0.024	0.007	0	0	0	0	0	0	0.03	0	0.014
Jul	0	0	0	0	0	0	0	0	0	0	0
Aug	0	0	0	0	0	0	0	0	0	0	0
Sept	0	0	0	0	0	0	0	0	0	0	0
Oct											
Nov											
Dec											
Total	0.024	0.007	0	0	0	0	0	0	0.03	0	0.014

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
(3) Broken concrete for recycling into aggregates.

Appendix 6.1

Event Action Plans

Appendix 6.1 Event and Action Plan

Event and Action Plan for Construction Air Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	1. Inform IEC, ER and Contractor; 2. Identify source, investigate the causes of exceedance and propose remedial measures; 3. Repeat measurement to confirm finding.	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.
2. Exceedance for two or more consecutive samples	1. Inform IEC, ER and Contractor; 2. Identify source; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC, ER and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. 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 the ET/ER on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to ER and IEC within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Event and Action Plan for Construction Air Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
LIMIT LEVEL				
1.Exceedance for one sample	1. Inform IEC, ER, Contractor and EPD; 2. Identify source, investigate the causes of exceedance and propose remedial measures; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	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 the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Discuss with ET and IEC on remedial actions 3. Submit proposals for remedial actions to IEC within 3 working days of notification; 4. Implement the agreed proposals; 5. Amend proposal if appropriate.
2.Exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER and Contractor to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 5. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to terminate that portion of work until the exceedance ceases.	1. Take immediate action to avoid further exceedance; 2. Discuss with ET and IEC on remedial actions 3. Submit proposals for remedial actions to ER and IEC within 3 working days of notification; 4. Implement the agreed proposals; 5. Resubmit proposals if problem still not under control; 6. Stop the relevant portion of works as determined by the ER until the exceedance ceases.

Event and Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level	1. Notify IEC, ER and Contractor of exceedance; 2. Identify source 3. Investigate the causes of exceedance and propose remedial measures; 4. Report the results of investigation to the IEC, ER and Contractor; 5. Discuss with the IEC, ER and Contractor and formulate remedial measures; 6. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the 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 ER with copy to ET and IEC; 2. Implement noise mitigation proposals.
Limit Level	1. Inform IEC, ER, EPD and Contractor; 2. Identify source; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	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, investigate what portion of the work is responsible and instruct the Contractor to terminate that portion of work until the exceedance ceases.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER with copy to ET and IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Terminate the relevant portion of works as determined by the ER until the exceedance ceases.

Event and Action Plan for Water Quality

EVENT	ACTION			
	ET Leader	**IEC**	**ER**	**Contractor**
ACTION LEVEL				
Action level being exceeded by one sampling day	1. Repeat in situ measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor and ER; 4. Check monitoring data, all plant, equipment and Contractor's working methods.	1. Check monitoring data submitted by ET and Contractor's working methods.	1. Confirm receipt of notification of non-compliance in writing; 2. Notify Contractor.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, ER and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Action level.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Supervise the implementation of mitigation measures.	. Discuss with IEC on the proposed mitigation measures; 2. Ensure mitigation measures are properly implemented; 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Submit proposal of additional mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER; 5. Implement the agreed mitigation measures.

Event and Action Plan for Water Quality

EVENT	ACTION			
	ET Leader	**IEC**	**ER**	**Contractor**
LIMIT LEVEL				
Limit level being exceeded by one sampling day	1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, ER and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly.	1. Confirm receipt of notification of failure in writing; 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Request Contractor to review the working methods.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER.
Limit level being exceeded by two or more consecutive sampling days	1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, ER and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the Contractor's mitigation measures whenever necessary to assure their effectiveness and advise the ER accordingly; 4. Supervise the implementation of mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented; 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level.	1. Take immediate action to avoid further exceedance; 2. Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER; 3. Implement the agreed mitigation measures; 4. Resubmit proposals of mitigation measures if problem still not under control; 5. As directed by the Supervising Officer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.

Appendix 6.2

Summary for Notification of Exceedance

Summary for Notification of Exceedance

Ref No.	Date	Location	Parameters (Unit)	Measured	Action Level	Limit Level	Follow-up Action
-	-	-	-	-	-	-	-

Ref. No.	Date	Time	Location	Construction Noise Level	Parameter	Action Level	Limit Level	Follow-up action
-	-	-	-	-	-	-	-	-

Appendix 8.1

Complaint Log

Environmental Complaints Log

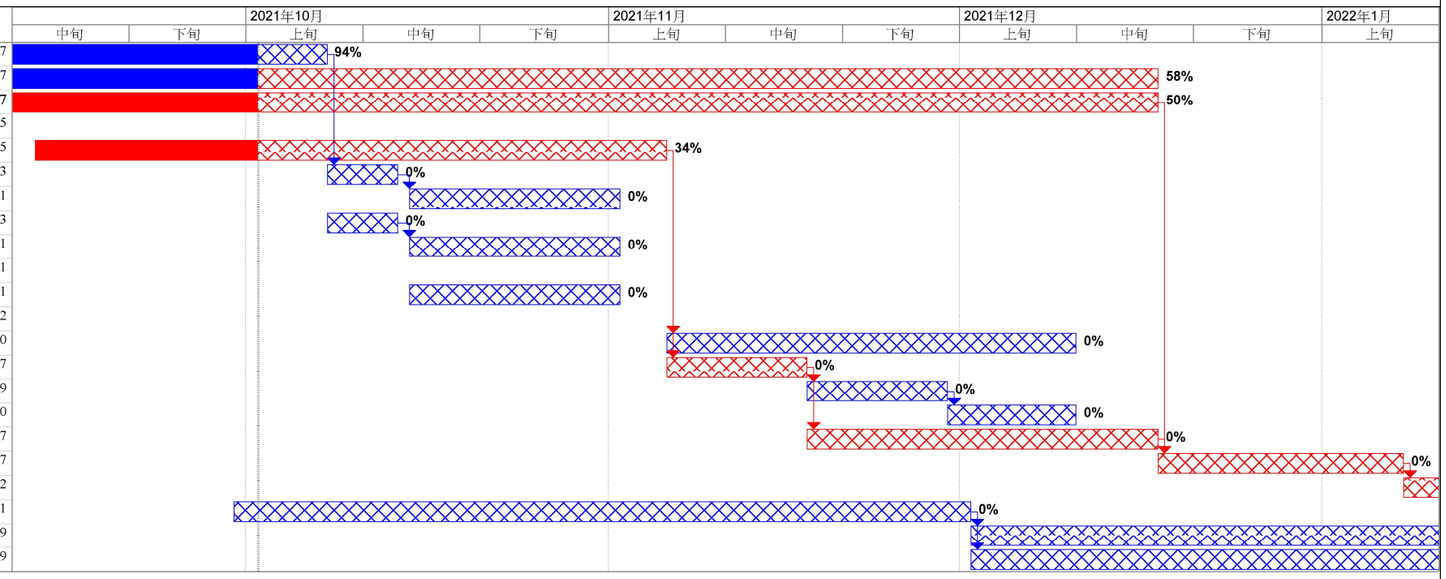
Complaint Log No.	Date of Complaint	Received From and Received By	Location of Complainant	Nature of Complaint	Outcome	Status
-	-	-	-	-	-	-

Appendix 9.1

Construction Programme of Individual Contracts

Contract No. HY/2019/14 New Wang Tong River Bridges
3-Month Rolling Programme

識別碼	Task Name	完成百分	工期	開始時間	完成時間
1	Submissions & Approval for Works within Wang Tong River (PS 1.93(1) (a)) DIA	94%	80 days	2021/7/5	2021/10/7
2	Engineer's Design Review	58%	153 days	2021/6/19	2021/12/17
3	Cost Saving Design Proposal (Submission and Approval)	50%	130 days	2021/7/16	2021/12/17
4	Tree Felling	100%	39 days	2021/7/12	2021/8/25
5	Pre-drilling for CSD Piling Works (11 Holes)	34%	44 days	2021/9/13	2021/11/5
6	Submission of the proposed Sub-contractor for cofferdam works	0%	5 days	2021/10/8	2021/10/13
7	Submission of method statements and risk assessments of cofferdam works	0%	15 days	2021/10/15	2021/11/1
8	Submission of the proposed Sub-contractor for piling works	0%	5 days	2021/10/8	2021/10/13
9	Submission of method statements and risk assessments of piling works	0%	15 days	2021/10/15	2021/11/1
10	Submission of the proposed Sub-contractor for structural steelworks	100%	5 days	2021/7/16	2021/7/21
11	Submission of method statements and risk assessments of steelworks	0%	15 days	2021/10/15	2021/11/1
12	Sub-contracting Piling and Structure Steel Works	100%	10 days	2021/7/22	2021/8/2
13	Construction of cofferdams (for MP1, MP2 & MP3)	0%	30 days	2021/11/6	2021/12/10
14	MP1	0%	10 days	2021/11/6	2021/11/17
15	MP2	0%	10 days	2021/11/18	2021/11/29
16	MP3	0%	10 days	2021/11/30	2021/12/10
17	Mobilization Plants and Staging for Piling Works	0%	26 days	2021/11/18	2021/12/17
18	Preliminary Piling (2 numbers) (2 Piles located at Pile MP2)	0%	15 days	2021/12/18	2022/1/7
19	Tension & Compression Load Test for Preliminary Piles	0%	52 days	2022/1/8	2022/3/12
20	Submission of Shop Drawing for Structural Steel works and Approval	0%	52 days	2021/9/30	2021/12/1
21	Fabrication of Structural Steelwork for two bridges (106 tonne)	0%	48 days	2021/12/2	2022/1/29
22	Submit Bridge Bearings and Movement Joint for approval	0%	48 days	2021/12/2	2022/1/29



3-Month Rolling Programme (E)
Date: 20210930

Critical | Task | Baseline | Milestone | Project Summary | Deadline
Critical Split | Split | Baseline Split | Summary Progress | External Tasks
Critical Progress | Task Progress | Baseline Milestone | Summary | External Milestone