CONTRACT NO: HY/2019/14

NEW WANG TONG RIVER BRIDGE

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

MONTHLY ENVIRONMENTAL MONITORING & AUDIT REPORT

FEBRUARY 2024

CLIENTS:

Highways Department

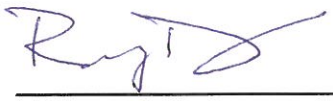
PREPARED BY:

Lam Environmental Services Limited

19/F Remex Centre,
42 Wong Chuk Hang Road,
Hong Kong

Telephone: (852) 2882-3939
Facsimile: (852) 2882-3331
E-mail: info@lamenviro.com
Website: http://www.lamenviro.com

CERTIFIED BY:



Raymond Dai
Environmental Team Leader

DATE:

14 March 2024

ANEWR

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

Your reference:

Our reference: HKHYD202/50/109563

Date: 14 March 2024

Attention: Mr Kennick Ho

BY EMAIL & POST
(email: e3-1.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 (February 2024)

We refer to emails of 9 and 12 March 2024 attaching a Monthly Environmental Monitoring & Audit Report (February 2024) prepared by the Environmental Team (ET) of the captioned.

We have no further comment and hereby verified the Monthly Environmental Monitoring & Audit Report (February 2024) 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 Chris Ip on 2618 2831.

Yours faithfully
ANEWR CONSULTING LIMITED

James Choi
Independent Environmental Checker

CPSJ/LCCR/ICHC/lsmt

cc Lam Environmental Services Limited – Mr Raymond Dai (Fax no.: 2882 3331)

ANewR Consulting Limited
Unit 1813, 1815-16, 18/F, Tower A, Regent Centre
63 Wo Yi Hop Road, Kwai Chung, Hong Kong
Tel: (852) 2618 2831 Fax: (852) 3007 8648
Email: info@anewr.com
Web: www.anewr.com

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EXECUTIVE SUMMARY

i. This is the Environmental Monitoring and Audit (EM&A) Monthly Report – February 2024 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 32nd EM&A report presenting the environmental monitoring findings and information recorded during the period of 1 February 2024 to 29 February 2024. 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:

- Abutment & Pier Construction

Noise Monitoring

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

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

Air Quality Monitoring

v. 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.

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

Water Quality Monitoring

vii. Water quality monitoring was conducted at seven monitoring stations three days per week according to the schedule in the reporting month.

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.

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

Site Inspections and Audit

x. The Environmental Team (ET) conducted weekly site inspections on 7, 21 and 28 February 2024. IEC attended the joint site inspection on 28 February 2024. No non-compliance was found during the site inspection while reminders on environmental measures were recommended.

xi. The Environmental Team (ET) conducted monthly landscape site inspections on 28 February 2024. No non-compliance was found during the site inspection.

Complaints, Notifications of Summons and Successful Prosecutions

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

Reporting Changes

xiii. There are no particular reporting changes.

Future Key Issues

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

Key Construction Works	Recommended Mitigation Measures
• Steel Member Erection • Bridge Deck Construction • MCS4 Construction	• 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 surface runoff collection and perimeter protection to properly treat runoff without direct discharge into Wang Tong River; • Provision of water-tight cofferdam for piling construction in 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. Terry Chung	3903 6799	3188 3418
	Engineer's Representative	Engineer	Mr. Yeung Sui Chung	3903 6813	3188 3418
Unison Construction Engineering Limited	Contractor	Site Agent	Mr. Peter Lui	2690 2232	2363 3199
		Environmental Officer	Ms. Rita		
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.

- Abutment Construction

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

- Steel Member Erection
- Bridge Deck Construction
- MCS4 Construction

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
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
Notification pursuant to Air Pollution Control (Construction Dust) Regulation	Form NA submitted to EPD on 25 Jun 2021.			
Discharge Licence	WT00040069-2021	10/1/2022	31/1/2027	Valid
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	6346
Acoustic Calibrator	Larson Davis CAL200	13098

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 since mid-September 2021, 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	B19128, B19129
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 (℃), 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	14E100105
Turbid meter	Xin Rui WGZ-3B	2202020

4.3.18 Calibration certificates of the water quality monitoring equipment attached in ***Appendix 4.2*** will be prepared in the 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 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	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 Water quality monitoring results measured in this reporting period are reviewed and summarized. Details of water quality monitoring results and graphical presentation can be referred in ***Appendix 5.4***.

5.3.2 No exceedances were recorded in this reporting month. Event and Action Plan has been implemented with appropriate action taken as referred to corresponding notification of exceedance. Summary of exceedances recorded during the reporting month are summarized in ***Table 5.3***.

Table 5.1 Summary of Water Quality Exceedances

Station	Parameter	DO (S&M)		DO (Bottom)		Turbidity		SS		Exceedance count	
	Level exceeded	Mid Ebb	Mid Flood	Mid Ebb	Mid Flood	Mid Ebb	Mid Flood	Mid Ebb	Mid Flood	Mid Ebb	Mid Flood
W1	Action	N/A	-	N/A	-	N/A	-	N/A	-	N/A	-
	Limit	N/A	-	N/A	-	N/A	-	N/A	-	N/A	-
W2	Action	N/A	-	N/A	-	N/A	-	N/A	-	N/A	-
	Limit	N/A	-	N/A	-	N/A	-	N/A	-	N/A	-
W4	Action	N/A	-	N/A	-	N/A	-	N/A	-	N/A	-
	Limit	N/A	-	N/A	-	N/A	-	N/A	-	N/A	-
W5	Action	-	N/A	-	N/A	-	N/A	-	N/A	-	N/A
	Limit	-	N/A	-	N/A	-	N/A	-	N/A	-	N/A
W6	Action	-	N/A	-	N/A	-	N/A	-	N/A	-	N/A
	Limit	-	N/A	-	N/A	-	N/A	-	N/A	-	N/A
W7	Action	-	N/A	-	N/A	-	N/A	-	N/A	-	N/A
	Limit	-	N/A	-	N/A	-	N/A	-	N/A	-	N/A
W8 Surface	Action	-	N/A	-	N/A	-	N/A	-	N/A	-	N/A
	Limit	-	N/A	-	N/A	-	N/A	-	N/A	-	N/A
W8 Bottom	Action	-	N/A	-	N/A	-	N/A	-	N/A	-	N/A
	Limit	-	N/A	-	N/A	-	N/A	-	N/A	-	N/A
Total	Action	-	-	-	-	-	-	-	-	-	-
	Limit	-	-	-	-	-	-	-	-	-	-

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

5.4 Waste Management

5.4.1 The quantities of waste for disposal in the Reporting Period are summarized in ***Table 5.2*** and ***Table 5.3***. The Monthly Summary Waste Flow Table is shown in ***Appendix 5.5***. Whenever possible, materials were reused on-site as far as practicable.

Table 5.2 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)	0.04492	0.74954	0.79446

Table 5.3 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	0.003	0.003
Chemical Wastes (in '000kg)	0	0	0
General Refuses (in '000m^3)	0	0.2323	0.2323

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

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 3, 10, 17 and 24 January 2024. IEC attended the joint site inspection on 24 January 2024.

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
20240207_1	07 Feb 2024	Nil.	Nil.	Nil.
20240221_1	21 Feb 2024	Nil.	Nil.	Nil.
20240228_1	28 Feb 2024	Nil.	Nil.	Nil.

7.0.3. Within this reporting month, monthly landscape site audits were conducted on 28 February 2024.

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
20240228_1	28 Feb 2024	Nil.	Nil.	Nil.

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
February 2024	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
• Steel Member Erection • Bridge Deck Construction • MCS4 Construction	• 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 surface runoff collection and perimeter protection to properly treat runoff without direct discharge into Wang Tong River; • Provision of water-tight cofferdam for piling construction in Wang Tong River; and • Proper waste handling and storage.