



JOB No.: TCS00874/16

CEDD CONTRACT NO. CV/2012/05
DEVELOPMENT OF A BATHING BEACH AT LUNG MEI,
TAI PO

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT
REPORT (APRIL 2021)

PREPARED FOR
WELCOME CONSTRUCTION CO., LTD

Date	Reference No.	Prepared By	Certified By
12 May 2021	TCS00874/16/600/R0720v2	 Nicola Hon (Environmental Consultant)	 T.W. Tam (Environmental Team Leader)

Version	Date	Remarks
1	11 May 2021	First Submission
2	12 May 2021	Amended according to the IEC's comments

Environmental Permit No. EP-388/2010

Development of a Bathing Beach at Lung Mei, Tai Po

Independent Environmental Checker Verification


Reference Document/Plan

Document/ Plan to be Certified / Verified:	Monthly Environmental Monitoring and Audit Report (April 2021)
Date of Report:	12 May 2021
Date received by IEC:	14 May 2021

Reference EP Condition/Updated EM&A Manual Requirement

Environmental Permit Condition / Updated EM&A Manual Reference	Condition 4.4
Three hard copies and one electronic copy of monthly EM&A Report shall be submitted to the Director within 2 weeks after the end of the reporting month. The EM&A Reports shall include a summary of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit Levels). The submissions shall be certified by the ET Leader and verified by the IEC. Additional copies of the submission shall be provided to the Director upon request by the Director.	

IEC Verification

I hereby verify that the above referenced document/ plan complies with the above referenced condition of EP-388/2010.	
Mr Terence Fong	Date: 14 May 2021
Independent Environmental Checker	

EXECUTIVE SUMMARY

- ES.01 Civil Engineering and Development Department (hereafter referred as “CEDD”) is the Project Proponent and the Permit Holder of *Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po* (hereinafter referred as “the Project”), which is a Designated Project to be implemented under Environmental Permit number EP-388/2010 (hereinafter referred as “the EP-388/2010” or “the EP”).
- ES.02 Action-United Environmental Services & Consulting (hereinafter referred as “AUES”) has been commissioned as the Environmental Team for the Project (hereinafter referred as “the ET”) to perform relevant Environmental Monitoring and Audit (EM&A) programme, including baseline and impact environmental monitoring in accordance with the EM&A Manual approved under the Environmental Impact Assessment Ordinance (EIAO).
- ES.03 According to the Approved EM&A Manual [November 2007] (hereinafter referred as ‘the EM&A Manual’), air quality, construction noise and water quality monitoring should be required to be monitored for baseline and during the construction phase of the Project. In January 2018, an updated EM&A Manual (AUES Ref.: TCS00874/16/300/L0085 dated 11 January 2018) was prepared to update of noise and air sensitive receivers and recent site condition for the EM&A programme and it was submitted and approved by EPD in January 2018.
- ES.04 This is the **41st** monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from **1st to 30th April 2021** (hereinafter ‘the Reporting Period’). In the Reporting Period, the impact monitoring covered air quality and construction noise.

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

- ES.05 In view of substantial completion of work and in consideration of the scale and nature of remaining works, it is considered that the potential environmental impacts associated with the remaining works for Project are negligible. A proposal for suspension of air quality and noise monitoring was submitted to EPD on 28 April 2021 for approval and the Proposal is currently under review by EPD.
- ES.06 Environmental monitoring activities under the EM&A programme in the Reporting Period are summarized in the following table.

Issues	Environmental Monitoring Parameters / Inspection	Sessions ^{Note 1}
Air Quality	1-hour TSP	7
	24-hour TSP	5 (#)
Construction Noise	L _{Aeq(30min)} Daytime	5
Inspection / Audit	ET Regular Environmental Site Inspection	2
	Independent Environmental Checker (IEC) Monthly Environmental Site Audit	1

Remark: There were 6 sessions of 24-hour TSP monitoring scheduled in the Reporting Period, however, 1 session at A7 and 6 sessions of A4 were failed due to the power issue.

BREACH OF ACTION AND LIMIT (A/L) LEVELS

- ES.07 No exceedance of air quality and construction noise monitoring were recorded in this Reporting Period. The statistics of environmental exceedance, NOE issued and investigation of exceedance are summarized in the following table.

Environmental Issues	Monitoring Parameters	Exceedance		Event & Action	
		Action Level	Limit Level	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	-	-
	24-hour TSP	0	0	-	-
Construction Noise	L _{Aeq(30min)}	0	0	-	-

ENVIRONMENTAL COMPLAINT

ES.08 No environmental complaint was recorded or received in this Reporting Period. The statistics of environmental complaint are summarized in the following table.

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 30 April 2021	0	2	Dust (2)

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.09 No environmental summons or successful prosecutions were recorded in this Reporting Period. The statistics of environmental complaint are summarized in the following tables.

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 30 April 2021	0	0	N/A

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 30 April 2021	0	0	N/A

REPORTING CHANGE

ES.10 There was no reporting change in the EM&A programme in this Reporting Period.

SITE INSPECTION

ES.11 In the Reporting Period, joint site inspection by ET and the Contractor was performed on **20th and 30th April 2021**. No non-compliance was noted during the two occasions.

FUTURE KEY ISSUES

ES.12 In view of substantial completion of work and in consideration of the scale and nature of remaining works, it is considered that the potential environmental impacts associated with the remaining works for Project are negligible. A proposal for suspension of air quality and noise monitoring was submitted to EPD on 28 April 2021 for approval and the Proposal is currently under review by EPD.

ES.13 The remaining activities in **May 2021** are E&M Works (installation of CCTV, Public announcement, fan, lighting system etc. at two lookout towers) and landscaping. The potential environmental impacts associated with the remaining works for Project are considered negligible. However, the Contractor should provide dust and noise mitigation measures as applicable, in accordance with the EM&A requirement during the remaining construction phase.

Table of Contents

1. INTRODUCTION	1
1.1 PROJECT BACKGROUND	1
1.2 REPORT STRUCTURE	2
2. PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS	3
2.1 PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE	3
2.2 CONSTRUCTION PROGRESS	4
2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS	4
3. SUMMARY OF IMPACT MONITORING REQUIREMENTS	6
3.1 GENERAL	6
3.2 MONITORING PARAMETERS	6
3.3 MONITORING LOCATIONS	6
3.4 MONITORING FREQUENCY AND PERIOD	7
3.5 MONITORING INSTRUMENT	7
3.6 MONITORING PROCEDURES	8
3.7 METEOROLOGICAL INFORMATION	10
3.8 DETERMINATION OF ACTION/LIMIT (A/L) LEVELS	10
3.9 DATA MANAGEMENT AND DATA QA/QC CONTROL	10
4. AIR QUALITY MONITORING	12
4.1 GENERAL	12
4.2 RESULTS OF AIR QUALITY MONITORING	12
5. CONSTRUCTION NOISE MONITORING	14
5.1 GENERAL	14
5.2 RESULTS OF NOISE MONITORING	14
6. WATER QUALITY MONITORING	15
6.1 GENERAL	15
7. WASTE MANAGEMENT	16
7.1 GENERAL	16
7.2 RECORDS OF WASTE QUANTITIES	16
8. ECOLOGY	17
8.1 ECOLOGY MONITORING (MARINE-BASED)	17
9. SITE INSPECTION	19
9.1 REQUIREMENTS	19
9.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH	19
10. ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE	20
10.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION	20
11. IMPLEMENTATION STATUS OF MITIGATION MEASURES	21
11.1 GENERAL	21
11.2 IMPACT FORECAST	21
12. CONCLUSIONS AND RECOMMENDATIONS	22
12.1 CONCLUSIONS	22
12.2 RECOMMENDATIONS	22

LIST OF TABLES

TABLE 2-1	STATUS OF ENVIRONMENTAL LICENSES AND PERMITS
TABLE 2-2	SUBMISSION STATUS AS UNDER THE EP STIPULATION
TABLE 3-1	SUMMARY OF EM&A IMPACT MONITORING REQUIREMENTS
TABLE 3-2	LOCATION OF AIR QUALITY MONITORING
TABLE 3-3	DESIGNATED NOISE MONITORING STATION ACCORDING TO THE EM&A MANUAL
TABLE 3-4	NOISE MONITORING STATIONS OF THE EM&A PROGRAMME
TABLE 3-5	AIR QUALITY MONITORING EQUIPMENT
TABLE 3-6	CONSTRUCTION NOISE MONITORING EQUIPMENT
TABLE 3-7	ACTION AND LIMIT LEVELS FOR AIR QUALITY
TABLE 3-8	ACTION AND LIMIT LEVELS FOR CONSTRUCTION NOISE
TABLE 4-1	SUMMARY OF 24-HOUR AND 1-HOUR TSP MONITORING RESULTS (A4)
TABLE 4-2	SUMMARY OF 24-HOUR AND 1-HOUR TSP MONITORING RESULTS (A7)
TABLE 5-1	CONSTRUCTION NOISE MONITORING RESULTS OF N1
TABLE 5-2	CONSTRUCTION NOISE MONITORING RESULTS OF N2A
TABLE 5-3	CONSTRUCTION NOISE MONITORING RESULTS OF N3A
TABLE 5-4	CONSTRUCTION NOISE MONITORING RESULTS OF N4
TABLE 7-1	SUMMARY OF QUANTITIES OF INERT C&D MATERIALS
TABLE 7-2	SUMMARY OF QUANTITIES OF C&D WASTES
TABLE 8-1	SUMMARY OF SUBMISSION FOR SEAHORSE MONITORING
TABLE 8-2	SUMMARY OF SUBMISSION FOR MARINE ECOLOGICAL MONITORING
TABLE 9-1	SITE OBSERVATIONS
TABLE 10-1	STATISTICAL SUMMARY OF ENVIRONMENTAL COMPLAINTS
TABLE 10-2	STATISTICAL SUMMARY OF ENVIRONMENTAL SUMMONS
TABLE 10-3	STATISTICAL SUMMARY OF ENVIRONMENTAL PROSECUTION
TABLE 11-1	ENVIRONMENTAL MITIGATION MEASURES IN THE REPORTING MONTH

LIST OF APPENDICES

APPENDIX A	LAYOUT PLAN OF THE PROJECT
APPENDIX B	ORGANIZATION STRUCTURE AND CONTACT DETAILS
APPENDIX C	3-MONTH ROLLING CONSTRUCTION PROGRAM
APPENDIX D	MONITORING LOCATION
APPENDIX E	CALIBRATION CERTIFICATE OF MONITORING EQUIPMENT
APPENDIX F	EVENT AND ACTION PLAN
APPENDIX G	IMPACT MONITORING SCHEDULES
APPENDIX H	DATABASE OF MONITORING RESULT
APPENDIX I	GRAPHICAL PLOTS OF MONITORING RESULTS
APPENDIX J	METEOROLOGICAL DATA
APPENDIX K	WASTE FLOW TABLE
APPENDIX L	IMPLEMENTATION SCHEDULE OF ENVIRONMENTAL MITIGATION MEASURES

1. INTRODUCTION

1.1 PROJECT BACKGROUND

- 1.1.1 Civil Engineering and Development Department (hereafter referred as “CEDD”) is the Project Proponent and the Permit Holder of *Agreement No. CE 59/2005 (EP) Development of a Bathing Beach at Lung Mei, Tai Po* (hereinafter referred as “the Project”), which is a Designated Project to be implemented under Environmental Permit number EP-388/2010 (hereinafter referred as “the EP-388/2010” or “the EP”).
- 1.1.2 The major construction activities of the Project comprise construction of 200-metre long bathing beach with a groyne at each end, a shark prevention net; a public car park; retaining walls; and the associated roadworks, drainage and sewerage works. Layout plan of the Project is shown in *Appendix A*. Designated works of the Project under the EP shall include:
- (i) Construction of a 200m long beach with a groyne at each end of the beach which includes dredging and sandfilling works;
 - (ii) Construction of one culvert at the eastern side of the beach and another small section of culvert and open drainage channel with gabion embankments at the western end, both to collect and divert surface runoff from upstream locations; and
 - (iii) Construction of a beach building with associated beach building facilities, kiosk and a carpark and associated road improvement works adjoining the facility.
- 1.1.3 CEDD is Site Resident Engineers (hereinafter referred as “SRE”) responsible for the Project management; Welcome Construction CO., Ltd is a Main Contractor (hereinafter referred as “Contractor”) responsible for construction of the Project; and Action-United Environmental Services & Consulting (hereinafter referred as “AUES”) has been commissioned as an Independent Environmental Team (hereinafter referred as “the ET”) to implement the relevant EM&A programme in accordance with the approved EM&A Manual, as well as the associated duties. Moreover, Environmental Resources Management is Independent Environmental Checker (hereinafter referred as “IEC”) of the Project.
- 1.1.4 As part of the Environmental Monitoring and Audit (EM&A) programme, baseline monitoring to determine the ambient environmental conditions including air quality, noise and water quality were undertaken between **7 June 2017** and **21 October 2017**. After completed baseline monitoring, Baseline Monitoring Report for Air Quality and Noise (*AUES Ref.: TCS00874/16/600/R0022v3*) and Baseline Monitoring Report for Water Quality (*AUES Ref.: TCS00874/16/600/R0036v2*) were verified by IEC and submitted to EPD for endorsement. These Baseline Monitoring Reports have summarized the key findings of baseline condition and determined a set of Action and Limit Levels (A/L Levels) based on the baseline data. The A/L Levels will serve as the yardsticks for assessing the acceptability of the environmental impact during construction phase of the Project Works impact monitoring.
- 1.1.5 The construction phase of the Project commenced on 1st December 2017. Accordingly, the impact monitoring of the EM&A programme commenced on the same date.
- 1.1.6 As advised by the Contractor and confirmed by CEDD, all marine dredging was completed in late October 2019 and all sand laying underwater has been substantially completed in late August 2020. It is confirmed that no further filling operation in the site after sub-tidal profile survey check conducted on 31 August 2020 and CEDD have no adverse comment on it. The standing type silt curtain installed as per Figure 3 of the Environmental Permit No. EP-388/2010 was removed and the shark prevention net was installed on 17 September 2020. In view of completion of all the marine activities including dredging and sand laying underwater, the impact marine water quality monitoring for the Project was terminated on 31 August 2020 according to the updated EM&A Manual Section 5.1.5. The notification of termination of impact marine water quality monitoring was issued to CEDD, IEC and EPD without adverse comment received.
- 1.1.7 This is the **41st** monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from **1st to 30th April 2021**.

1.2 REPORT STRUCTURE

1.2.1 The Monthly EM&A Report is structured into the following sections:-

<i>Section 1</i>	Introduction
<i>Section 2</i>	Project Organization and Construction progress
<i>Section 3</i>	Summary of Impact Monitoring Requirements
<i>Section 4</i>	Air Quality Monitoring
<i>Section 5</i>	Construction Noise Monitoring
<i>Section 6</i>	Water Quality Monitoring
<i>Section 7</i>	Waste Management
<i>Section 8</i>	Ecology
<i>Section 9</i>	Site Inspection
<i>Section 10</i>	Environmental Complaint and non-compliance
<i>Section 11</i>	Implementation Status of Mitigation Measures
<i>Section 12</i>	Conclusion and Recommendation

2. PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

2.1.1 Organization structure and contact details of relevant parties with respect to on-site environmental management are shown in [Appendix B](#). The responsibilities of respective parties are:

Engineer or Engineers Representative (ER)

2.1.2 The ER is responsible for overseeing the construction works and for ensuring that the works are undertaken by the Contractor in accordance with the specification and contract requirements. The duties and responsibilities of the ER with respect to EM&A are:

- monitor the Contractor's compliance with contract specifications, including the effective implementation and operation of environmental mitigation measures and other aspects of the EM&A programme;
- instruct the Contractor to follow the agreed protocols or those in the Contract Specifications in the event of exceedances or complaints;
- comply with the agreed Event and Action Plans in the event of any exceedance;
- liaise with the IEC and assist as necessary in the implementation of the EM&A program; and
- participate in joint site inspection undertaken by the ET and IEC.

The Contractor

2.1.3 The duties and responsibilities of the Contractor are:

- work within the scope of the construction contract and other tender conditions;
- provide assistance to the ET in carrying out monitoring;
- Submit proposals on mitigation measures in case of exceedances of Action and Limit levels in accordance with the Event and Action Plans;
- implement measures to reduce impact where Action and Limit levels are exceeded;
- implement the corrective actions instructed by ER/ET/IEC;
- participate in the site inspections undertaken by the ET and the IEC, as required, and undertake any corrective actions instructed by ER/ET/IEC; and
- adhere to the procedures for carrying out complaint investigation.

Environmental Team (ET)

2.1.4 The ET will be led and managed by the ET Leader. The ET leader will have relevant education, training, knowledge, experience and professional qualifications and the appointment will be subject to the approval of the Director of Environmental Protection and ER. Suitably qualified staff will be included in the ET, and the ET should not be in any way an associated body of the Contractor or the Independent Environmental Checker (IEC) for the Project.

2.1.5 The duties and responsibilities of the ET are:

- monitor various environmental parameters as required in this EM&A Manual;
- assess the EM&A data and review the success of the EM&A programme determining the adequacy of the mitigation measures implemented and the validity of the EIA predictions as well as identify any adverse environmental impacts before they arise;
- carry out regular site inspection to investigate and audit the Contractor's site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and effect proactive action to pre-empt issues;
- review the Contractor's working programme and methodology, and comment as necessary;
- review and prepare reports on the environmental monitoring data, site environmental conditions and audits;
- report on the environmental monitoring and audit results and conditions to the IEC, Contractor, EPD and ER;
- recommend suitable mitigation measures to the Contractor in the case of exceedance of Action and Limit levels in accordance with the Event and Action Plans;

- adhere to the procedures for carrying out complaint investigation; and,
- the ET Leader will keep a contemporaneous log-book and record each and every instance or circumstance or change of circumstances which may affect the environmental impact assessment and every non-conformance with the recommendations of the EIA Reports or the EPs.

Independent Environmental Checker (IEC)

2.1.6 The duties and responsibilities of the IEC are:

- review and monitor the implementation of the EM&A programme and the overall level of environmental performance being achieved;
- arrange and conduct monthly independent site inspections/audits of the works;
- validate and confirm the accuracy of monitoring results, monitoring equipment, monitoring stations, monitoring procedures and locations of sensitive receivers;
- carry out random sample check and audit on monitoring data and sampling procedures, etc;
- audit the EIA recommendations and requirements against the status of implementation of environmental protection measures on site;
- on needed basis, audit the Contractor’s construction methodology and agree the appropriate, reduced impact alternative in consultation with ER, the ET and the Contractor;
- provide specialist advice to ER and the Contractor on environmental matters;
- check complaint cases and the effectiveness of corrective measures;
- check that the necessary mitigation measures recommended in the EIA, EP and Contract documents, or as subsequently required, are effectively implemented;
- review EM&A report submitted by the ET leader and feedback audit results to ET by signing off relevant EM&A proformas;
- report the findings of site inspections/ audits and other environmental performance reviews to ER, ET, EPD and the Contractor;

2.2 CONSTRUCTION PROGRESS

2.2.1 The 3-month rolling construction program is enclosed in [Appendix C](#) and the major construction activities undertaken in the Reporting Period are listed below:-

- E&M works (installation of CCTV, public announcement, fan and lighting system etc.);
- Landscaping;
- Lookout tower finishing works; and
- Speed enforcement camera

2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.3.1 Summary of currently relevant permits, licenses, and/or notifications on environmental protection for this Project in this Reporting Period is presented in [Table 2-1](#).

Table 2-1 Status of Environmental Licenses and Permits

Item	Description	License/Permit Status		
		Permit no./Account no./ Ref. no.	From	To
1	Air pollution Control (Construction Dust) Regulation	Ref. Number: 418137	N/A	N/A
2	Chemical Waste Producer Registration	Waste Producers Number (WPN): 5213-728-W3437-01	21 August 2017	End of Project
3	Water Pollution Control Ordinance	License No.: WT00028905-2017	24 October 2017	31 October 2022

Item	Description	License/Permit Status		
		Permit no./Account no./ Ref. no.	From	To
4	Waste Disposal (Charges for Disposal of Construction Waste) Regulation	Billing Account for Disposal of Construction Waste: Account No. 7017686	3 July 2013	End of Project

2.3.2 The submission status as under the EP requirement is presented in [Table 2-2](#).

Table 2-2 Submission Status as under the EP Stipulation

Item	EP condition	Description	Status
1	2.3	Management Organization of the Main Construction Companies	The updated version was submitted in May 2018
2	2.4	Report for Capture and Relocation of Common Rat Snake	Approved by EPD on 15 Sep 2017 (EPD ref.: (15) in EP2/N5/C/46 Pt.6 dated 15 Sep 2017)
3	2.5	Landscape Plan	Re-submitted to EPD on 12 April 2021
4	3.12	Mangrove Seedling Planting Proposal	Approved by EPD on 22 April 2021 (EPD ref.: () in EP2/N5/C/46 Pt.9 dated 22 April 2021)
5	3.13	Detailed Landscape As-built Drawing(s)	Re-submitted to EPD on 10 May 2021
6	4.3	Baseline Monitoring Report for Air Quality and Noise (AUES Ref.: TCS00874/16/600/R0022v3)	Approved by EPD on 8 Jan 2018 (EPD ref.: (36) in EP2/N5/C/46 Pt.6 dated 8 Jan 2018)
7		Baseline Monitoring Report for Water Quality(AUES Ref.: TCS00874/16/600/R0036v2)	Approved by EPD on 10 Jan 2018 (EPD ref.: (37) in EP2/N5/C/46 Pt.6 dated 10 Jan 2018)

3. SUMMARY OF IMPACT MONITORING REQUIREMENTS

3.1 GENERAL

3.1.1 The EM&A requirements are set out in the EM&A manual and environmental issues such as air quality, construction noise and water quality were identified as the key issues during the construction phase of the Project. In view of completion of all the marine activities, the impact marine water quality monitoring for the Project was terminated on 31 August 2020 according to the updated EM&A Manual Section 5.1.5. A summary of the EM&A requirements for air quality and noise monitoring are presented in the sub-sections below.

3.2 MONITORING PARAMETERS

3.2.1 According to the Project EM&A Manual, the Impact monitoring programme covers the following environmental issues:

- Air Quality; and
- Construction Noise

3.2.2 A summary of the monitoring parameters is presented in *Table 3-1* below.

Table 3-1 Summary of EM&A Impact Monitoring Requirements

Environmental Issue	Parameters
Air Quality	<ul style="list-style-type: none"> • 1-hour TSP • 24-hour TSP
Noise	<ul style="list-style-type: none"> • Leq (30min) in six consecutive Leq(5 min) between 07:00-19:00 on normal weekdays

3.3 MONITORING LOCATIONS

Air Quality

3.3.1 There are air quality monitoring locations (A4 and A6) recommended in Section 3.1 of the EM&A Manual. During liaison with the landlord of A6, he refused to provide access and location for installation of High Volume Air Sampler (HVAS). Therefore, alternative location (A7) was proposed by ET in accordance with Section 3.4 of the EM&A Manual. The proposed alternative locations are considered capable of effectively representing the baseline conditions at the impact monitoring locations. The proposal (*ref no.: TCS00874/16/300/L0016b*) for alternative monitoring locations was verified by IEC and it has been submitted to EPD for approval on 8 May 2017. The air quality monitoring locations are in *Table 3-2* and illustrated in *Appendix D*.

Table 3-2 Location of Air Quality Monitoring

Station ID	Location
A4	No. 101 Lung Mei Tsuen
A7	Hong Kong Eco-Farm

Construction Noise

3.3.2 According to Section 4.1 of the EM&A Manual, four designated noise sensitive receivers (N1, N2, N3 and N4) were recommended and they are listed in *Table 3-3* and illustrated in *Appendix D*.

Table 3-3 Designated Noise Monitoring Station according to the EM&A Manual

NSR	Location
N1	Village house - No. 165A Lung Mei
N2*	Village house - No. 103 Lung Mei
N3	Village house - No. 70 Lo Tsz Tin
N4	Village house - No. 79 Lo Tsz Tin

Remarks: ()Noise monitoring should be conducted at N2a (i.e House No. 101 Lung Mei) if it is changed to residential use during construction phase.*

3.3.3 As confirmed on the first day of baseline monitoring, N2a (House no. 101 Lung Mei) has been changed to residential use. Therefore, the noise monitoring is conducted at N2a and to replace N2. Moreover, due to the lack of accessibility of noise monitoring at N3 (Village house – No. 70 Lo Tsz Tin), alternative location was proposed to replace N3 to carry out the noise monitoring. Having reviewed the surrounding condition, N3a (Village house – No. 66C Lo Tsz Tin) was proposed with the rationales summarized in below.

- 1) The distance between N3 and N3a is about 18 meter apart and N3a locates at close proximity of the project site and major site activities which are likely to have noise impacts;
- 2) N3a is a village type residential house and it is a noise sensitive receiver (NSR);
- 3) Accessibility for noise monitoring work at N3a is available; and
- 4) Minimal disturbance would be only caused to the proposed monitoring location N3a.

3.3.4 The proposal (*ref no.: TCS00874/16/300/L0016b*) for alternative monitoring locations was verified by IEC and it has been submitted to EPD for approval on 8 May 2017. The noise monitoring stations under the EM&A programme are listed in **Table 3-4** and illustrated in **Appendix D**.

Table 3-4 Noise Monitoring Stations of the EM&A Programme

Station ID	Address
N1	Village house No. 165A of Lung Mei
N2a	Village house No. 101 of Lung Mei
N3a	Village house No. 66C of Lo Tsz Tin
N4	Village house No. 79 of Lo Tsz Tin

3.4 MONITORING FREQUENCY AND PERIOD

3.4.1 The frequency and the duration for impact monitoring are summarized below.

Air Quality Monitoring

- **Parameters:** 1-hour TSP and 24-hour TSP
- **Frequency:** 3 times every six days for 1-hour TSP and once every 6 days for 24-hour TSP
- **Duration:** Throughout the construction period

Noise Monitoring

- **Parameters:** $L_{Aeq(30min)}$ and statistical results L_{10} & L_{90}
- **Frequency:** $Leq(30min)$ in 6 consecutive $Leq(5min)$ for once a week during 07:00-19:00 on normal weekdays
- **Duration:** Throughout the construction period

3.5 MONITORING INSTRUMENT

Air Quality Monitoring

3.5.1 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B*. If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to the IEC to prove that the instrument is capable of achieving a comparable results to the HVS. The instrument should be calibrated regularly, and the 1-hour sampling shall be determined on yearly basis by the HVS to check the validity and accuracy of the results measured by direct reading method. The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.

3.5.2 All equipment to be used for air quality monitoring is listed in **Table 3-6**.

Table 3-5 Air Quality Monitoring Equipment

Equipment	Model
24-Hour TSP	
High Volume Air Sampler	TISCH High Volume Air Sampler, HVS Model TE-5170
Calibration Kit	TISCH Calibration Kit Mode TE-5025A
1-Hour TSP	
Portable Dust Meter	Sibata LD-3B Laser Dust Meter

Noise Monitoring

3.5.3 Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in ms^{-1} for reference.

3.5.4 Monitoring equipment to be used for construction noise measurement is listed in **Table 3-7**.

Table 3-6 Construction Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	Rion NL-52
Acoustic Calibrator	Rion NC-74 and Rion NC-75
Portable Wind Speed Indicator (#)	Anemometer AZ Instrument 8908

(#) Wind speed is reference data only and there is no calibration certificate for portable wind speed indicator.

3.6 MONITORING PROCEDURES

Air Quality

1-hour TSP

3.6.1 Operation of the 1-hour TSP meter will follow manufacturer’s Operation and Service Manual.

3.6.2 The 1-hour TSP monitor, brand named “Sibata LD-3B Laser Dust Meter” is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90° light scattering. The 1-hour TSP monitor consists of the following:

- a. A pump to draw sample aerosol through the optic chamber where TSP is measured;
- b. A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and
- c. A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

3.6.3 The 1-hour TSP meter to be used will be within the valid period, calibrated by the manufacturer prior to purchasing. Zero response of the instrument will be checked before and after each monitoring event. Annually calibration with the High Volume Sampler (HVS) in same condition would be undertaken by the Laboratory.

24-hour TSP

3.6.4 The equipment used for 24-hour TSP measurement is the High Volume Sampler (hereinafter the “HVS”) brand named TISCH, Model TE-5170 TSP High Volume Air Sampler, which complied with *EPA Code of Federal Regulation, Appendix B to Part 50*. The HVS consists of the following:

- a. An anodized aluminum shelter;
- b. A 8”x10” stainless steel filter holder;
- c. A blower motor assembly;
- d. A continuous flow/pressure recorder;
- e. A motor speed-voltage control/elapsed time indicator;

- f. A 7-day mechanical timer, and
- g. A power supply of 220v/50 hz

3.6.5 For HVS for 24-hour TSP monitoring, the HVS is mounted in a metallic cage with a top for protection and also it is sat on the existing ground or the roof of building. The flow rate of the HVS between 0.6m³/min and 1.7m³/min will be properly set in accordance with the manufacturer's instruction to within the range recommended in *EPA Code of Federal Regulation, Appendix B to Part 50*. Glass Fiber Filter 8" x 10" of TE-653 will be used for 24-Hour TSP monitoring and would be supplied by laboratory. The general procedures of sampling are described as below:-

- A horizontal platform with appropriate support to secure the samples against gusty wind should be provided;
- No two samplers should be placed less than 2 meters apart;
- The distance between the sampler and an obstacle, such as building, must be at least twice the height that the obstacle protrudes above the sample;
- A minimum of 2 meters of separation from any supporting structure, measured horizontally is required;
- Before placing any filter media at the HVS, the power supply will be checked to ensure the sampler work properly;
- The filter paper will be set to align on the screen of HVS to ensure that the gasket formed an air tight seal on the outer edges of the filter. Then filter holder frame will be tightened to the filter hold with swing bolts. The holding pressure should be sufficient to avoid air leakage at the edge.
- The mechanical timer will be set for a sampling period of 24 hours (00:00 mid-night to 00:00 mid-night next day). Information will be recorded on the field data sheet, which would be included the sampling data, starting time, the weather condition at current and the filter paper ID with the initial weight;
- After sampling, the filter paper will be collected and transfer from the filter holder of the HVS to a sealed envelope and sent to a local HOKLAS accredited laboratory for quantifying.

3.6.6 All the sampled 24-hour TSP filters will be collected and put into the filter envelope provided by the laboratory. The sample will be kept in normal air conditioned room conditions, i.e. 70% HR (Relative Humidity) and 25°C and delivery to the office within 48 hours and sent to laboratory for analysis. The sampled filter will be kept in the laboratory for six months prior to disposal.

3.6.7 The HVS used for 24-hour TSP monitoring will be calibrated before the commencement for sampling, and after in two months interval for 1 point checking of maintenance and six months interval for five points calibrate in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (TISCH Calibration Kit Model TE-5025A) to establish a relationship between the follow recorder meter reading in cfm (cubic feet per minute) and the standard flow rate, Qstd, in m³/min. Motor brushes of HVS will be regularly replaced of about five hundred hours per time.

Construction Noise

3.6.8 As referred to in the Technical Memorandum (TM) issued under the NCO, sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804:1985 (Type 1) specifications shall be used for carrying out the noise monitoring. Immediately prior to and following each noise measurement the accuracy of the sound level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration levels from before and after the noise measurement agree to within 1.0 dB.

3.6.9 All noise measurements will be performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (Leq). Leq_(30 min) in six consecutive Leq_(5 min) measurements will be used as the monitoring parameter for the time period between 07:00-19:00 hours on weekdays.

- 3.6.10 The sound level meter will be mounted on a tripod at a height of 1.2 m and placed at the assessment point and oriented such that the microphone is pointed to the site with the microphone facing perpendicular to the line of sight. The windshield will be fitted for all measurements. Where a measurement is to be carried out at a building, the assessment point would normally be at a position 1 m from the exterior of the building façade. Where a measurement is to be made for noise being received at a place other than a building, the assessment point would be at a position 1.2 m above the ground in a free-field situation, i.e. at least 3.5 m away from reflective surfaces such as adjacent buildings or walls.
- 3.6.11 Immediately prior to and following each noise measurement the accuracy of the sound level meter will be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements will be accepted as valid only if the calibration level from before and after the noise measurement agrees to within 1.0 dB.
- 3.6.12 Noise measurements will not be made in fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. The wind speed will be checked with a portable wind speed meter capable of measuring the wind speed in m/s.
- 3.6.13 Valid calibration certificates of monitoring equipment of air quality and construction noise are shown in [Appendix E](#).

3.7 METEOROLOGICAL INFORMATION

- 3.7.1 The meteorological information including wind direction, wind speed, humidity, rainfall, air pressure and temperature etc. during impact monitoring is extracted from the closest Hong Kong Observatory Station. To obtain the most appropriate meteorological information where available, Air Temperature/Pressure and Relative Humidity will be extracted from Tai Po Station and wind speed and direction will be extracted from Tai Mei Tuk Station.

3.8 DETERMINATION OF ACTION/LIMIT (A/L) LEVELS

- 3.8.1 The baseline results form the basis for determining the environmental acceptance criteria for the impact monitoring. A summary of the Action/Limit (A/L) Levels for air quality, construction noise and water quality are shown in [Table 3-10](#), [3-11](#) and [3-12](#) respectively.

Table 3-7 Action and Limit Levels for Air Quality

Monitoring Station	Action Level ($\mu\text{g}/\text{m}^3$)		Limit Level ($\mu\text{g}/\text{m}^3$)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
A4	275	142	500	260
A7	274	141	500	260

Table 3-8 Action and Limit Levels for Construction Noise, dB(A)

Time Period: 0700-1900 hours on normal weekdays		
Monitoring Location	Action Level	Limit Level ^{Note 1 & Note 2}
N1, N2a, N3a, and N4	When one documented complaint is received	75

Note 1: Acceptable Noise Levels for school should be reduced to 70 dB(A) and 65 dB(A) during examination period

Note 2: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the NCA have to be followed.

Event Action Plan

- 3.8.2 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan which presented in [Appendix F](#).

3.9 DATA MANAGEMENT AND DATA QA/QC CONTROL

- 3.9.1 The impact monitoring data were handled by the ET's in-house data recording and management

system.

- 3.9.2 The monitoring data recorded in the equipment were downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data were input into a computerized database properly maintained by the ET. The laboratory results were input directly into the computerized database and checked by personnel other than those who input the data.
- 3.9.3 For monitoring parameters that require laboratory analysis, the local laboratory shall follow the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory tests.

4. AIR QUALITY MONITORING

4.1 GENERAL

4.1.1 In the Reporting Period, air quality monitoring were performed at the proposed monitoring locations A4 and A7. The air quality monitoring schedule is presented in [Appendix G](#) and the monitoring results are summarized in the following sub-sections.

4.2 RESULTS OF AIR QUALITY MONITORING

4.2.1 In the Reporting Period, 7 sessions of 1-hour TSP and were performed at Stations A4 and A7. There were 6 sessions of 24-hour TSP monitoring scheduled in the Reporting Period. However, it was noted that the power supplies for HVS for 24-hour TSP monitoring at Locations A4 and A7 were disconnected by the Contractor on 30 March 2021 and the 24-hour TSP monitoring scheduled on and after 30 March 2021 were affected and unable to carry out. Meanwhile, the power supply for A7 has been reconnected on 9 April 2021 and the monitoring was resumed immediately. The status 24-hour TSP monitoring are summarized in below table.

Scheduled Monitoring Date	Status of 24-hr TSP Monitoring	
	A4	A7
1 Apr 2021	Power failure	Power failure
7 Apr 2021	Power failure	Make-up sample was conducted on 9 Apr 2021
13 Apr 2021	Power failure	On Schedule
19 Apr 2021	Power failure	On Schedule
24 Apr 2021	Power failure	On Schedule
29 Apr 2021	Power failure	On Schedule

4.2.2 The monitoring results for air quality monitoring are summarized in [Tables 4-1 to 4-2](#). The detailed 24-hour TSP and 1-hour TSP monitoring data are presented in [Appendix H](#) and the relevant graphical plots are shown in [Appendix I](#). The meteorological data during the impact monitoring period are summarized in [Appendix J](#).

Table 4-1 Summary of 24-hour and 1-hour TSP Monitoring Results (A4)

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
1-Apr-21	#	1-Apr-21	9:25	61	68	65
7-Apr-21	#	7-Apr-21	9:14	70	72	76
13-Apr-21	#	9-Apr-21	14:08	65	64	69
19-Apr-21	#	14-Apr-21	13:13	70	65	64
24-Apr-21	#	20-Apr-21	9:31	72	65	69
29-Apr-21	#	26-Apr-21	9:16	61	54	60
		30-Apr-21	13:21	80	75	77
Average (Range)	N/A	Average (Range)		68 (54 – 80)		

Remark (#) power failure for HVS

Table 4-2 Summary of 24-hour and 1-hour TSP Monitoring Results (A7)

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
1-Apr-21	#	1-Apr-21	9:18	65	70	71
9-Apr-21(*)	55	7-Apr-21	9:07	68	70	65
13-Apr-21	34	9-Apr-21	14:30	74	71	72
19-Apr-21	16	14-Apr-21	13:25	69	67	65
24-Apr-21	137	20-Apr-21	9:25	75	80	73
29-Apr-21	28	26-Apr-21	9:10	66	68	61

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st reading	2 nd reading	3 rd reading
		30-Apr-21	13:30	85	70	73
Average (Range)	54 (16 – 137)	Average (Range)		70 (61 – 85)		

Remark (#) power failure for HVS; (*) make up sampling for 7 Apr 2021.

- 4.2.3 As shown in **Tables 4-1 to 4-2**, all the 1-hour TSP and 24-hour TSP monitoring results were below the Action / Limit Level. No Notification of Exceedance (NOE) was issued in this Reporting Period.
- 4.2.4 The 24-hour TSP monitoring data of Location A4 was absent in the Reporting Month due to power issue. Although the 24-hour TSP monitoring was not able to carry out at Station A4, the justification on whether the ability of the EM&A programme to detect air quality impacts can be maintained though monitoring was suspended is presented below.
- All civil works under the Project were substantial completed and the impact source from the Project has been eliminated. The potential air quality environmental impacts associated with the remaining works were considered negligible. A proposal for suspension of air quality and noise monitoring was submitted to EPD on 28 April 2021 for approval and the Proposal is currently under review by EPD.
 - The 1-hour TSP monitoring was measured *in-situ* during the construction phase and it is capable to readily detect any non-compliance of air quality. During the period of 30 March to 30 April 2021, the 1-hour TSP monitoring results at Stations A4 and A7 are ranged from $54\mu\text{g}/\text{m}^3$ to $85\mu\text{g}/\text{m}^3$ which are far below the Action/ Limit Level, it is considered non-compliance of air quality of 24-hour TSP was unlikely to triggered.
 - April 2021 is typical wet season in Hong Kong and the weather becomes humid and hot. It is considered that the dust impact is not significant when compare to dry season. There were no non-compliance of air quality monitoring results recorded during the dry season in previous months, and it is believed that non-compliance of air quality of 24-hour TSP in April is not anticipated.

5. CONSTRUCTION NOISE MONITORING

5.1 GENERAL

5.1.1 In the Reporting Period, construction noise quality monitoring were performed at the designated monitoring locations N1, N2a, N3a and N4. The noise quality monitoring schedule is presented in [Appendix G](#) and the monitoring results are summarized in the following sub-sections.

5.2 RESULTS OF NOISE MONITORING

5.2.1 In the Reporting Period, 5 sessions of noise monitoring were carried out at the designated locations. Free-field status were performed at N1 and N3a and façade correction (+3 dB(A)) has been added for the correction in according to the acoustical principles and EPD guidelines. The noise monitoring results at the designated locations are summarized in [Tables 5-1 to 5-4](#). The detailed noise monitoring data are presented in [Appendix H](#) and the relevant graphical plots are shown in [Appendix I](#).

Table 5-1 Construction Noise Monitoring Results of N1, dB(A)

Date	Start Time	$L_{eq30min}$	*Corrected $L_{eq30min}$
1-Apr-21	9:25	63	66
7-Apr-21	14:08	57	60
14-Apr-21	13:10	56	59
20-Apr-21	9:40	63	66
26-Apr-21	9:00	59	62

Remark: (*) A façade correction of +3dB(A) has been added according to acoustical principles and EPD guidelines.

Table 5-2 Construction Noise Monitoring Results of N2a, dB(A)

Date	Start Time	$L_{eq30min}$	Corrected $L_{eq30min}$
1-Apr-21	10:05	65	NA
7-Apr-21	14:38	57	NA
14-Apr-21	13:40	56	NA
20-Apr-21	10:16	65	NA
26-Apr-21	9:31	64	NA

Table 5-3 Construction Noise Monitoring Results of N3a, dB(A)

Date	Start Time	$L_{eq30min}$	*Corrected $L_{eq30min}$
1-Apr-21	10:45	64	67
7-Apr-21	15:20	50	53
14-Apr-21	14:21	48	51
20-Apr-21	10:50	64	67
26-Apr-21	10:17	58	61

Remark: (*) A façade correction of +3dB(A) has been added according to acoustical principles and EPD guidelines.

Table 5-4 Construction Noise Monitoring Results of N4, dB(A)

Date	Start Time	$L_{eq30min}$	Corrected $L_{eq30min}$
1-Apr-21	11:25	53	NA
7-Apr-21	16:07	58	NA
14-Apr-21	15:00	59	NA
20-Apr-21	11:26	60	NA
26-Apr-21	10:54	58	NA

5.2.2 As shown in [Table 5-1 to Table 5-4](#), all the designated locations measured results were below 75dB(A) of the acceptance criteria. Furthermore, no complaint on construction noise was registered, indicating no exceedance of Action Level. No non-compliance was therefore found during the Reporting Period.

6. WATER QUALITY MONITORING

6.1 GENERAL

- 6.1.1 In view of completion of all the marine activities, the impact marine water quality monitoring for the Project was terminated on 31 August 2020 according to the updated EM&A Manual Section 5.1.5. The notification of termination of impact marine water quality monitoring was issued to CEDD, IEC and EPD without adverse comment received.
- 6.1.2 Pursuant to updated EM&A Manual Section 5.1.6, post-project marine water quality monitoring was conducted in September 2020 and October 2020 for 4 weeks to fulfill the EM&A requirement and the results were presented in the monthly EM&A report (October 2020).

7. WASTE MANAGEMENT

7.1 GENERAL

7.1.1 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time.

7.2 RECORDS OF WASTE QUANTITIES

7.2.1 All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil.

7.2.2 The quantities of waste for disposal in this Reporting Period are summarized in *Tables 7-1* and *7-2* and the Monthly Summary Waste Flow Table is shown in *Appendix K*. Whenever possible, materials were reused on-site as far as practicable.

Table 7-1 Summary of Quantities of Inert C&D Materials

Types of Waste	Quantity	Disposal Location
Total C&D Materials (Inert) ('000m ³)	0	NA
Reused in this Contract (Inert) ('000m ³)	0	NA
Reused in other Projects (Inert) ('000m ³)	0	NA
Disposal as Public Fill (Inert) ('000m ³)	0	NA

Table 7-2 Summary of Quantities of C&D Wastes

Types of Waste	Quantity	Disposal Location
Recycled Metal ('000kg)	0	NA
Recycled Paper / Cardboard Packing ('000kg)	0	NA
Recycled Plastic ('000kg)	0	NA
Chemical Wastes ('000kg)	0	NA
General Refuse ('000m ³)	0.0105	NENT

8. ECOLOGY

8.1 ECOLOGY MONITORING (MARINE-BASED)

Seahorse Translocation Surveys

8.1.1 The seahorse captured and translocation was conducted in the period of **17 to 20 January 2018**. Since the two tagged seahorses were not recorded at the Ting Kok East reception site during the first 7 days Post-translocation Seahorse Survey on 21 to 27 January 2018, Option 2 of monitoring programme was therefore adopted to perform the Post-translocation Seahorse Survey in accordance with the approved method statement (Seahorses Translocation Plan (Version 1, 11 January 2018) refers). The Post-translocation Seahorse Survey should be performed in the first year for a period of one year after the completion of seahorse translocation. The proposed survey time would be at least 28 man-hours (including 14 man-hours during daytime and 14 man-hours during nighttime for each survey). The survey frequency is listed below:

- Daily for first week
- three times per week for the second to fourth week
- once a week for the second to fourth month
- once a month for the fifth to twelve month

8.1.2 The one year Post-translocation Seahorse Survey at Ting Kok East was completed in January 2019. Post-construction will be undertaken at the installed shark net during the maintenance period of the Project. A summary of submission regarding seahorse monitoring is shown in below **Table 8-1**.

Table 8-1 Summary of Submission for Seahorse Monitoring

EM&A Ref.	Submission	First Submission Date	Latest Version Submission Date	Approval Status
S7.2.3.3	Seahorse Translocation Plan	19 Sep 2017	30 Nov 2017	Approved by EPD
S7.2.3.8	Pre-translocation Survey Report for Seahorse	1 Dec 2018	11 June 2020	Approved by EPD
S7.2.3.4	Seahorse Translocation Report	29 Jan 2018	11 June 2020	Approved by EPD
S7.2.3.9	<i>Post-translocation monitoring report (all reports)</i>			
	1 st Week	29 Jan 2018	To be updated by the Contractor	The report will be submitted for approval
	2 nd Week	4 Feb 2018		
	3 rd Week	27 Mar 2018		
	4 th Week	27 Mar 2018		
	Second Month	27 Mar 2018		
	Third Month	27 Mar 2018		
	Fourth Month	25 May 2018		
	Fifth Month	28 August 2018		
	Sixth Month	28 August 2018		
	Seventh Month	28 August 2018		
	Eighth Month	4 Oct 2018	14 July 2020	
	Ninth Month	19 Oct 2018	12 April 2021	Approved by EPD on 27 Apr 21
	Tenth Month	18 Nov 2018	12 April 2021	
	Eleventh Month	21 Dec 2018	12 April 2021	
	Twelfth Month	15 Feb 2019	12 April 2021	
S7.2.3.10	Post-construction monitoring report	To be submitted	To be submitted	Pending approval

Marine Ecological Monitoring

8.1.3 In accordance to Section 7.2 of the updated EM & A manual, it is required to conducting marine ecological monitoring after marine fauna relocation at a six-monthly interval at (i) vicinity site near bathing beach at Lung Mei and (ii) The Reception Site of Ting Kok East until expiry of the Contract Maintenance Period.

8.1.4 The objectives of the marine ecological monitoring are to collect data for determining whether there is any impact on the marine ecological resources (i) in the vicinity of the Site due to the development of the bathing beach at Lung Mei, and (ii) at the Reception Site of Ting Kok East due to translocation of the target marine fauna.

Marine Fauna Translocation

8.1.5 Target marine fauna, including fishes, starfish, sea urchins and sea cucumbers, shall be translocated from the intertidal area of the Site at Lung Mei to the intertidal area at the Reception Site of Ting Kok East before commencement of sand filling works or any other works that may cause disturbances to the existing marine ecology. The translocation works shall cover capturing, handling, holding, transporting and releasing of the captured target marine fauna.

8.1.6 Baseline quantitative quadrat surveys were conducted at the vicinity site of Lung Mei beach and Ting Kok East in June 2017. Moreover, fauna translocation was completed in January 2018. After the translocation, marine ecological monitoring was conducted at a six-monthly interval at vicinity site near bathing beach at Lung Mei and the reception Site of Ting Kok East until expiry of the Contract Maintenance Period.

8.1.7 A summary of submission regarding marine ecological monitoring is shown in below **Table 8-2**.

Table 8-2 Summary of Submission for Marine Ecological Monitoring

EM&A Ref.	Submission	First Submission Date	Latest Version Submission Date
S7.2.2.3	Fauna Translocation – Stage 1	9 Oct 2017	18 Dec 2017
S7.2.2.3	Fauna Translocation – Stage 2	19 Dec 2017	28 Dec 2017
S7.2.2.3	Fauna Translocation – Stage 3 and 4	5 Jan 2018	5 Jan 2018
S7.2.2.4	Fauna Translocation Report	29 May 2018	15 Jan 2019
S7.2.1.4 & S7.2.2.6	Report for Baseline Marine Ecological Survey on inter-tidal habitat (Lung Mei)	20 Jul 2017	15 Jan 2019
S7.2.1.4 & S7.2.2.6	Report for Baseline Marine Ecological Survey on inter-tidal habitat (Ting Kok)	26 Jun 2017	5 Oct 2019
S7.2.1.4 & S7.2.2.6	Marine Fauna Post-translocation Monitoring Report for Lung Mei (1 st Report)	11 Jul 2018	15 Dec 2018
S7.2.1.4 & S7.2.2.6	Marine Fauna Post-translocation Monitoring Report for Ting Kok (1 st Report)	11 Jul 2018	15 Dec 2018
S7.2.1.4 & S7.2.2.6	Marine Fauna Post-translocation Monitoring Report for Lung Mei (2 nd Report)	29 Jan 2019	18 May 2019
S7.2.1.4 & S7.2.2.6	Marine Fauna Post-translocation Monitoring Report for Ting Kok (2 nd Report)	11 Jan 2019	18 May 2019
S7.2.1.4 & S7.2.2.6	Marine Fauna Post-translocation Monitoring Report for Lung Mei (3 rd Report)	29 July 2019	To be submitted
S7.2.1.4 & S7.2.2.6	Marine Fauna Post-translocation Monitoring Report for Ting Kok (3 rd Report)	29 July 2019	To be submitted
S7.2.1.4 & S7.2.2.6	Marine Fauna Post-translocation Monitoring Report for Lung Mei (4 th Report)	To be submitted	To be submitted
S7.2.1.4 & S7.2.2.6	Marine Fauna Post-translocation Monitoring Report for Ting Kok (4 th Report)	To be submitted	To be submitted
S7.2.1.4 & S7.2.2.6	Marine Fauna Post-translocation Monitoring Report for Lung Mei (5 th Report)	To be submitted	To be submitted
S7.2.1.4 & S7.2.2.6	Marine Fauna Post-translocation Monitoring Report for Ting Kok (5 th Report)	To be submitted	To be submitted
S7.2.1.4 & S7.2.2.6	Marine Fauna Post-translocation Monitoring Report for Lung Mei (6 th Report)	To be submitted	To be submitted
S7.2.1.4 & S7.2.2.6	Marine Fauna Post-translocation Monitoring Report for Ting Kok (6 th Report)	To be submitted	To be submitted

9. SITE INSPECTION

9.1 REQUIREMENTS

9.1.1 According to the approved EM&A Manual, the environmental site inspection shall be formulation by ET Leader. The site inspection and audits should be conducted twice per month by ET.

9.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH

9.2.1 In the Reporting Period, joint site inspection and audit to evaluate site environmental performance was carried out by the RE, ET and the Contractor on **20th and 30th April 2021**. No non-compliance was noted within this reporting period.

9.2.2 The findings / deficiencies that observed during the weekly site inspection are listed in **Table 9-1**.

Table 9-1 Site Observations

Date	Findings / Deficiencies	Follow-Up Status
20 th April 2021	<ul style="list-style-type: none">No adverse environmental issue was observed.	<ul style="list-style-type: none">NA
30 th April 2021	<ul style="list-style-type: none">No adverse environmental issue was observed.	<ul style="list-style-type: none">NA

10. ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

10.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

- 10.1.1 In the Reporting Period, no environmental complaint, summons and prosecution was received.
- 10.1.2 In the Reporting Period, no summons and prosecution under the EM&A Programme was lodged for the project. The statistical summary table of environmental complaint is presented in *Tables 10-1, 10-2 and 10-3*.

Table 10-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 30 April 2021	0	2	Dust (2)

Table 10-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Summons Nature
1 – 30 April 2021	0	0	NA

Table 10-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Prosecution Nature
1 – 30 April 2021	0	0	NA

11. IMPLEMENTATION STATUS OF MITIGATION MEASURES

11.1 GENERAL

11.1.1 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (ISEMM) in the approved EM&A Manual covered the issues of dust, noise, water, ecology and waste etc. and they are summarized presented in [Appendix L](#).

11.1.2 The Contractor had been implementing the required environmental mitigation measures according to the Environmental Monitoring and Audit Manual subject to the site condition. Environmental mitigation measures generally implemented by the Contractor in this Reporting Month are summarized in [Table 11-1](#).

Table 11-1 Environmental Mitigation Measures in the Reporting Month

Issues	Environmental Mitigation Measures
Construction Noise	<ul style="list-style-type: none"> Regularly to maintain all plants and only the good condition plants were used on-site ; If possible, all mobile plants onsite operation has located far from NSRs; When machines and plants were not in using, it was switched off; Wherever possible, plant was prevented oriented directly the nearby NSRs; Weekly noise monitoring was conducted to ensure construction noise meet the criteria.
Air Quality	<ul style="list-style-type: none"> Stockpile of dusty material was covered entirely with impervious sheeting or sprayed with water so as to maintain the entire surface wet; The construction plants switched off when it not in use; Water spraying on haul road and dry site area was provided regularly;
Water Quality	<ul style="list-style-type: none"> Debris and refuse generated on-site collected daily; Oils and fuels were stored in designated areas with locks; The chemical waste storage as sealed area provided with locks; Portable chemical toilets were provided on-site. A licensed contractor was regularly disposal and maintenance of these facilities.
Waste and Chemical Management	<ul style="list-style-type: none"> Waste arising kept to a minimum and be handled, transported and disposed of in a suitable manner; Disposal of C&D wastes to any designated public filling facility and/or landfill followed a trip ticket system; and Chemical waste handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.
General	<ul style="list-style-type: none"> The site is generally kept tidy and clean. Mosquito control is performed to prevent mosquito breeding on site.

11.2 IMPACT FORECAST

11.2.1 Construction activities to be undertaken in **May 2021** should be included below:

- E&M Works (Installation of CCTV, Public announcement, fan, lighting system etc. at two lookout towers); and
- Landscaping;

11.2.2 In view of substantial completion of work and in consideration of the scale and nature of remaining works, it is considered that the potential environmental impacts associated with the remaining works for Project are negligible. A proposal for suspension of air quality and noise monitoring was submitted to EPD on 28 April 2021 for approval and the Proposal is currently under review by EPD.

11.2.3 The potential environmental impacts associated with the remaining works for Project are considered negligible. However, the Contractor was reminded that the environmental mitigation measures shall be properly implemented and maintained where applicable, as per the Mitigation Implementation Schedule in [Appendix L](#), in the remaining construction period.

12. CONCLUSIONS AND RECOMMENTATIONS

12.1 CONCLUSIONS

- 12.1.1 This is the 41st monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from 1st to 30th April 2021.
- 12.1.2 In view of substantial completion of work and in consideration of the scale and nature of remaining works, it is considered that the potential environmental impacts associated with the remaining works for Project are negligible. A proposal for suspension of air quality and noise monitoring was submitted to EPD on 28 April 2021 for approval and the Proposal is currently under review by EPD.
- 12.1.3 In this Reporting Period, no construction noise monitoring results that triggered the Limit Level was recorded. No NOE or the associated corrective actions were therefore issued. Moreover, no noise complaint (which is an Action Level exceedance) was received for the Project.
- 12.1.4 In this Reporting Period, no air quality monitoring exceedance was recorded. No NOE or the associated corrective actions were therefore issued.
- 12.1.5 In the Reporting Period, joint site inspection and audit to evaluate site environmental performance was carried out by the CEDD, ET and the Contractor on 20th and 30th April 2021. No non-compliance was noted within this reporting period. .
- 12.1.6 No environmental complaints, notification of summons or successful prosecution were received in this Reporting Period.

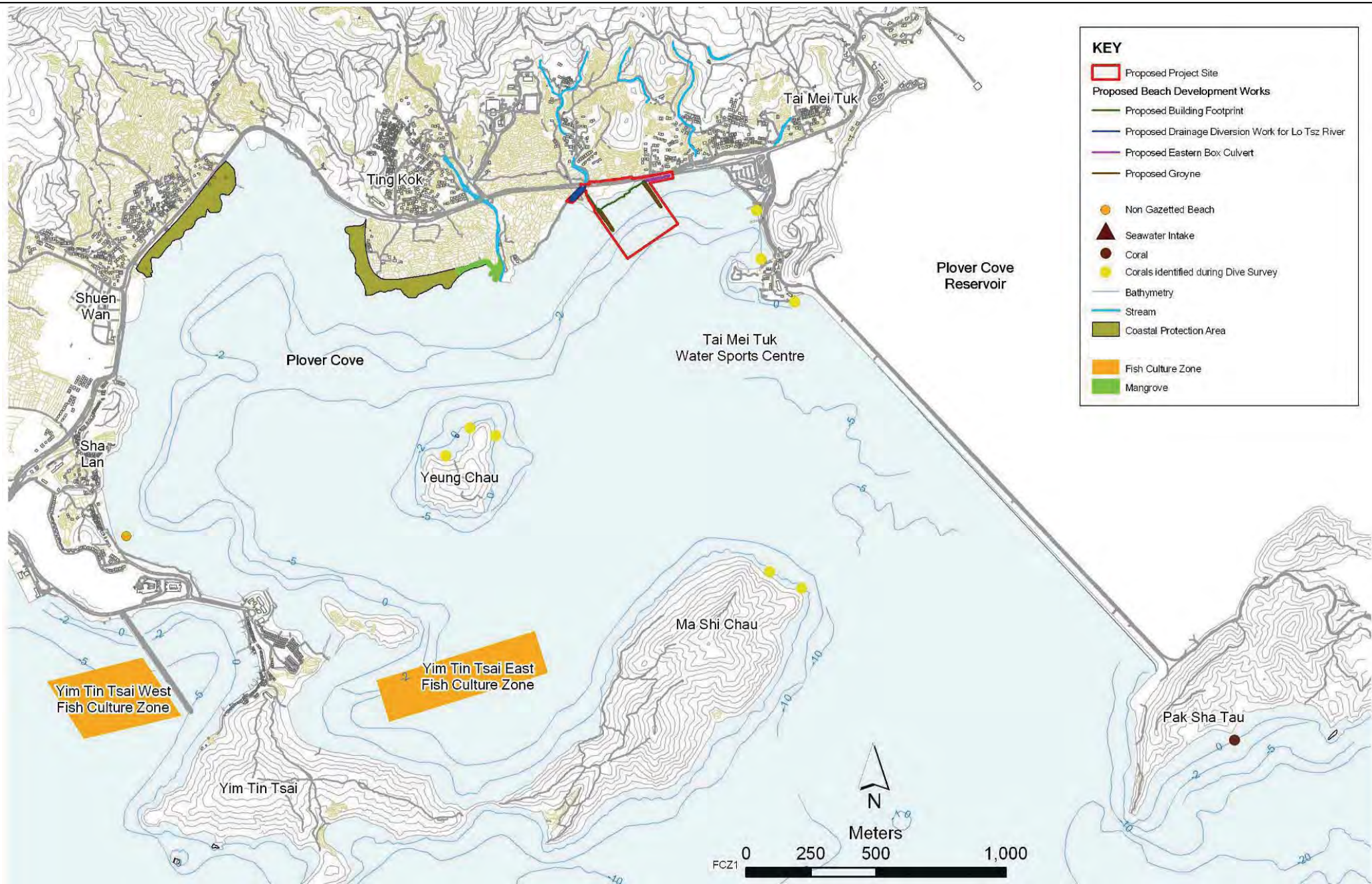
12.2 RECOMMENDATIONS

- 12.2.1 The remaining activities in May 2021 are E&M Works (installation of CCTV, Public announcement, fan, lighting system etc. at two lookout towers) and landscaping. The potential environmental impacts associated with the remaining works for Project are considered negligible. However, the Contractor should provide dust and noise mitigation measures as applicable, in accordance with the EM&A requirement during the remaining construction phase.

Appendix A

Layout plan of the Project

(The content of Appendix A is modified from the previous EM&A Manual – Development of a Bathing Beach at Lung Mei, Tai Po (Register No. AEIAR-123/2008): Environmental Monitoring and Audit (EM&A) Manual (November 2007))



KEY	
	Proposed Project Site
Proposed Beach Development Works	
	Proposed Building Footprint
	Proposed Drainage Diversion Work for Lo Tsz River
	Proposed Eastern Box Culvert
	Proposed Groyne
	Non Gazetted Beach
	Seawater Intake
	Coral
	Corals identified during Dive Survey
	Bathymetry
	Stream
	Coastal Protection Area
	Fish Culture Zone
	Mangrove

Client CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Main Contractor 偉金建築有限公司 Welcome Construction Co., Ltd.	Agreement No.: CE 59/2005(EP)	ENVIRONMENTAL MONITORING AND AUDIT MANUAL	FIGURE 1.1		
		Project Title: DEVELOPMENT OF A BATHING BEACH AT LUNG MEI, TAI PO	Figure Title: PROJECT LOCATION AND ENVIRONMENTAL SENSITIVE RECEIVERS	Checked TF	Scale AS SHOWN	Rev. 1
				Designed -	Drawn AM	Date 13/03/2007

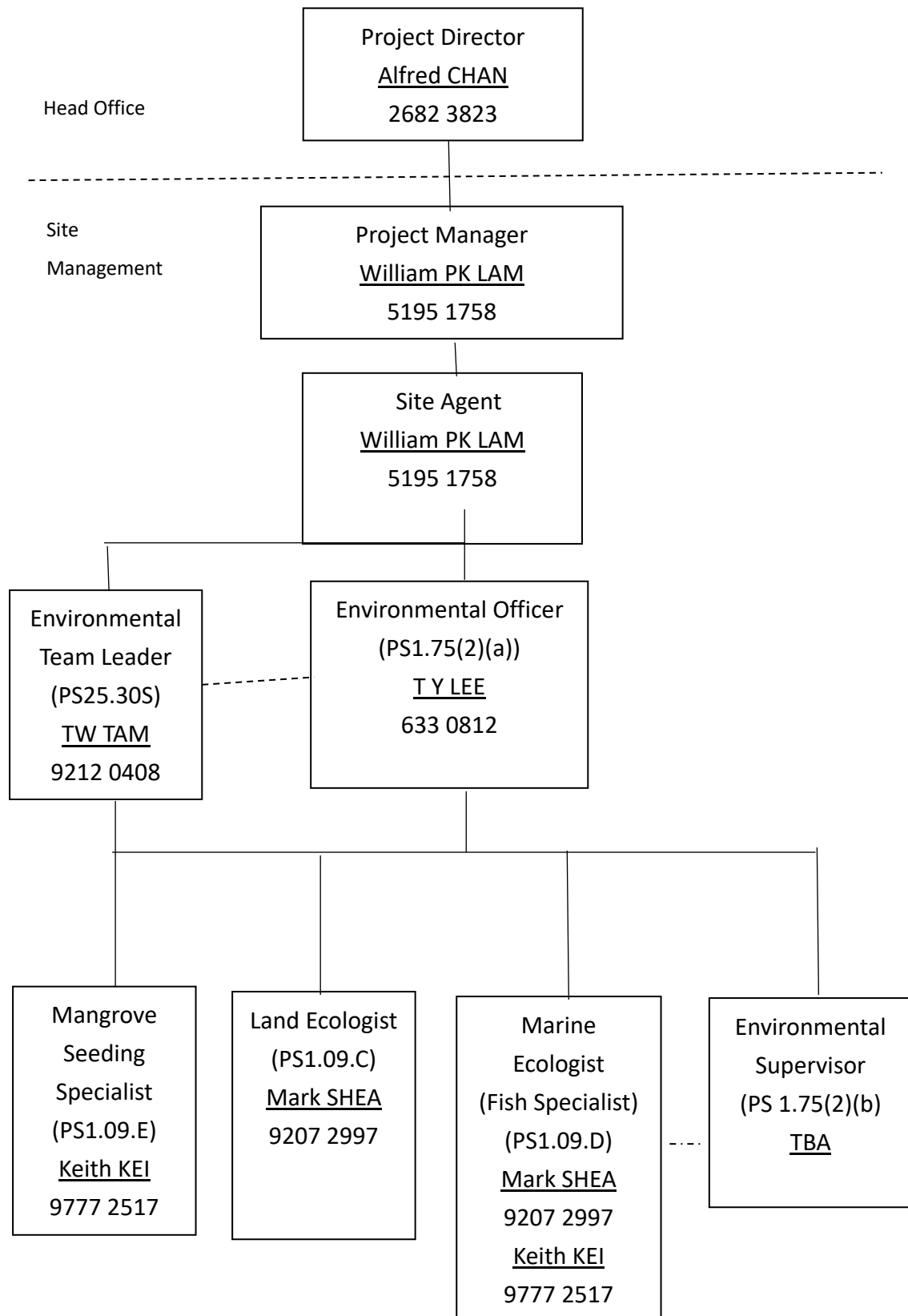
Appendix B

Organization structure and contact details

Welcome Construction Co. Ltd.

Contract No. CV/2012/05 Bathing Beach at Lung Mei, Tai Po

Project Organization Chart for Environmental Management



Contact Details of Key Personnel – CV/2012/05

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
CEDD	Engineer's Representative	Mr. K F Chan	2762 5532	2714 2054
ERM	Independent Environmental Checker	Mr. Terence Fong	2271 3156	2723 5660
Welcome	Project Manager	Mr. William Lam	5195 1758	2682 3222
Welcome	Site Agent	Mr. William Lam	5195 1758	2682 3222
Welcome	Environmental Officer	Mr. T Y Lee	6373 0812	2682 3222
Welcome	Environmental Supervisor	Mr. K K Lau	6055 9878	2682 3222
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

CEDD (Engineer) – Civil Engineering and Development Department

Welcome (Contractor) – Welcome Construction Company Limited

ERM (IEC) – Environmental Resources Management

AUES (ET) – Action-United Environmental Services & Consulting

Appendix C

3-Month Rolling Construction Program

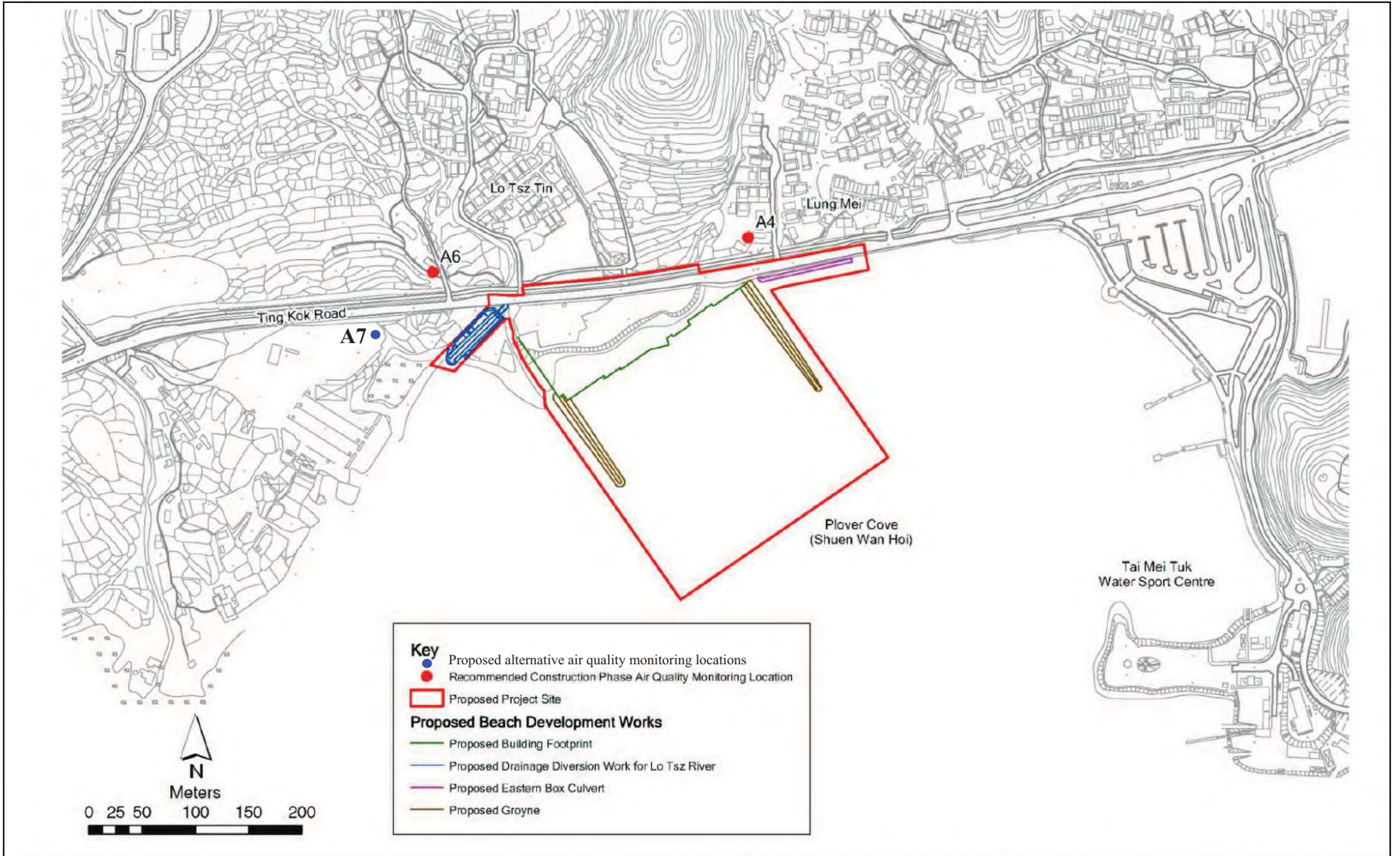
3-month Construction Program (April 2021 to June 2021)



Construction Work	April 2021	May 2021	June 2021
E&M Works	✓	✓	
Landscaping	✓	✓	
Lookout Tower Finishing Works	✓		
Speed Enforcement Camera	✓		

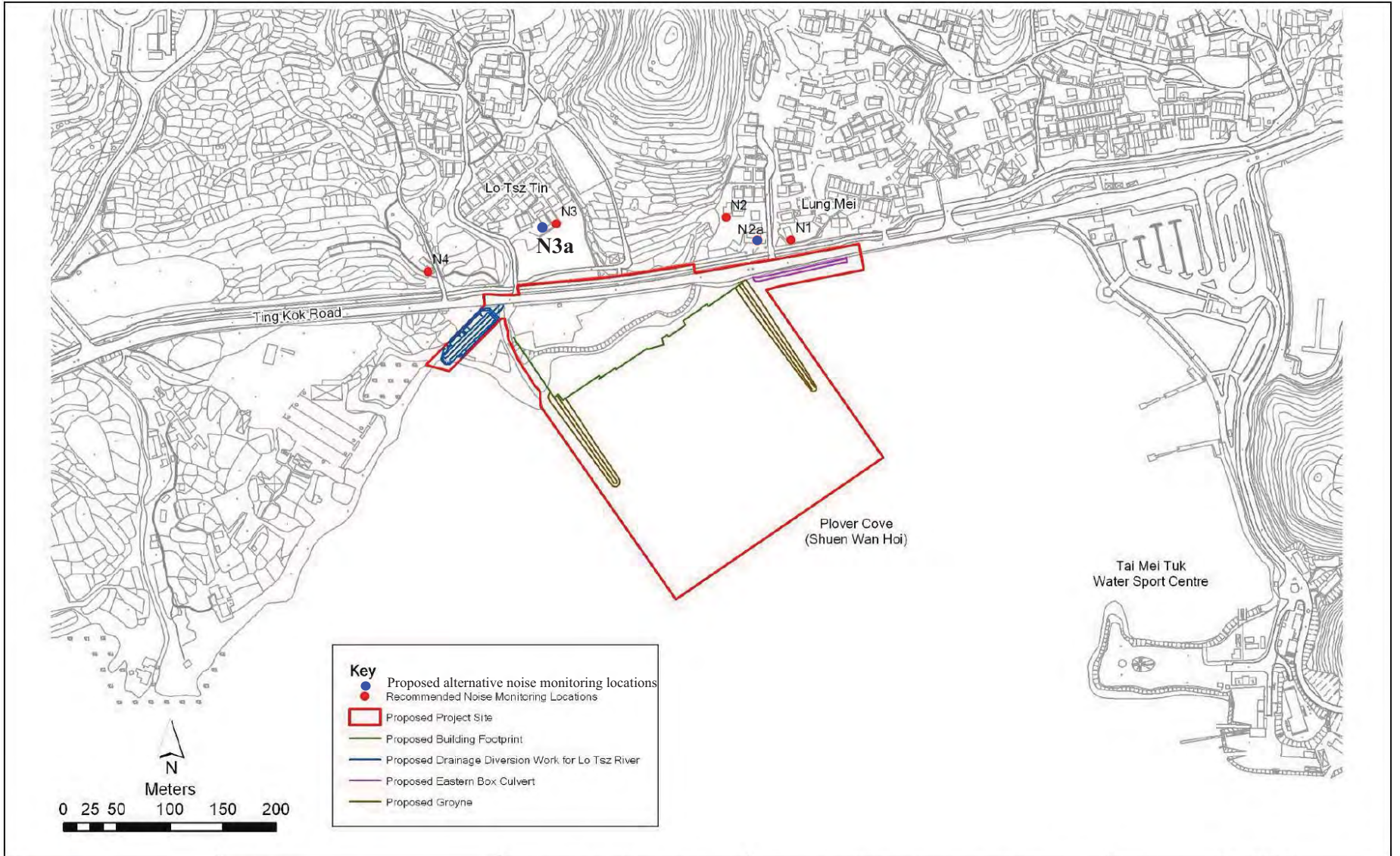
Appendix D



Monitoring Location

(The Figures of Appendix D are modified from the previous EM&A Manual – Development of a Bathing Beach at Lung Mei, Tai Po (Register No. AEIAR-123/2008): Environmental Monitoring and Audit (EM&A) Manual (November 2007))



Client  CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Main Contractor  偉全建築有限公司 Welcome Construction Co., Ltd.	Agreement No.: CE 59/2005(EP)	ENVIRONMENTAL MONITORING AND AUDIT MANUAL	FIGURE 3.1		
		Project Title: DEVELOPMENT OF A BATHING BEACH AT LUNG MEI, TAI PO	Figure Title: CONSTRUCTION PHASE AIR QUALITY MONITORING LOCATIONS	Checked: TF	Scale: AS SHOWN	Rev.: 2
				Designed: -	Drawn: KK	Date: 23/03/2007



Client  CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	 偉全建築有限公司 Welcome Construction Co., Ltd.	Agreement No.: CE 59/2005(EP)	ENVIRONMENTAL MONITORING AND AUDIT MANUAL	FIGURE 4.1		
		Project Title: DEVELOPMENT OF A BATHING BEACH AT LUNG MEI, TAI PO	Figure Title: CONSTRUCTION PHASE NOISE MONITORING LOCATIONS	Checked: TF	Scale: AS SHOWN	Rev.: 2
				Designed: -	Drawn: KK	Date: 29/08/2007

Photograph Records for Air Quality Monitoring

Air Quality Monitoring (24-Hour TSP & 1-Hour TSP)



A4



A7

Photograph Records for Noise Monitoring

Noise Monitoring



N1



N2a

Noise Monitoring



N3a



N4

Appendix E

Calibration Certificate of Monitoring Equipment

MONITORING EQUIPMENT CALIBRATION CERTIFICATES

Items	Aspect	Description of Equipment	Date of Calibration	Date of Next Calibration
1	Air	TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for A4	25 Jan 21	25 Mar 21 (no date due to power failure)
2		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for A7	26 Mar 21	26 May 21
3		Calibration Kit TISCH Model TE-5025A Orifice ID 1612 and Rootsmeter S/N 438320	19 Jan 21	19 Jan 22
4		Laser Dust Monitor, Model LD-3B (Serial No.366410) – EQ110	8 Jan 21	8 Jan 22
5		Laser Dust Monitor, Model LD-3B (Serial No. 3Y6503) – EQ112	8 Jan 21	8 Jan 22
6	Noise	Rion Sound Level Meter NL-52 (Serial No. 00921191) – EQ013	5 Aug 20	5 Aug 21
7		Rion Sound Level Meter NL-52 (Serial No. 00142581) – EQ015	30 Sep 20	30 Sep 21
8		Rion Sound Level Calibrator NC-75 (Serial No.: 34680623) – EQ089	20 Jan 21	20 Jan 22
9		Rion Sound Level Calibrator NC-74 (Serial No.: 3424492) – EQ083	3 Aug 20	3 Aug 21

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Hong Kong Eco-Farm

Date of Calibration: 26-Mar-21

Location ID : A7

Next Calibration Date: 26-May-21

Name and Model: TISCH HVS Model TE-5170

Technician: Fai So

CONDITIONS

Sea Level Pressure (hPa)
Temperature (°C)

1015.4
21.6

Corrected Pressure (mm Hg)
Temperature (K)

761.55
295

CALIBRATION ORIFICE

Make-> TISCH
Model-> 5025A
Serial # -> 1941

Qstd Slope ->
Qstd Intercept ->

2.10574
-0.00985

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION		
							Slope =	Intercept =	Corr. coeff. =
18	6.30	6.30	12.6	1.702	55	55.69	Slope = 38.0035 Intercept = -8.3974 Corr. coeff. = 0.9986		
13	4.90	4.90	9.8	1.501	48	48.60			
10	3.80	3.80	7.6	1.323	42	42.53			
7	2.40	2.40	4.8	1.052	32	32.40			
5	1.30	1.30	2.6	0.776	20	20.25			

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

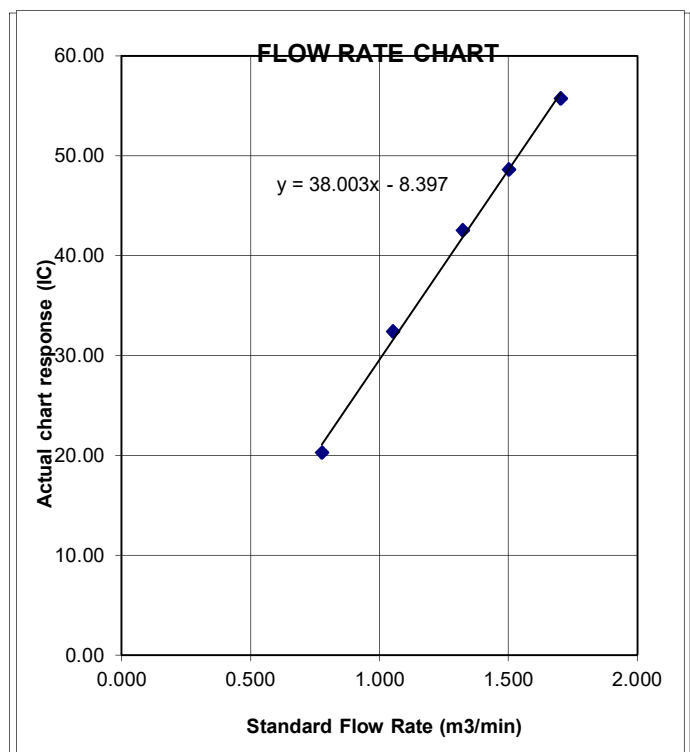
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





Certificate of Calibration

Calibration Certification Information			
Cal. Date: January 19, 2021	Rootsmeter S/N: 438320	Ta: 294	°K
Operator: Jim Tisch		Pa: 755.1	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: 1941		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4830	3.2	2.00
2	3	4	1	1.0420	6.4	4.00
3	5	6	1	0.9290	8.0	5.00
4	7	8	1	0.8840	8.8	5.50
5	9	10	1	0.7340	12.9	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)}$ (y-axis)
1.0029	0.6762	1.4192	0.9958	0.6715	0.8824
0.9986	0.9583	2.0071	0.9915	0.9516	1.2479
0.9965	1.0726	2.2440	0.9894	1.0650	1.3952
0.9954	1.1260	2.3535	0.9883	1.1180	1.4633
0.9899	1.3487	2.8385	0.9829	1.3391	1.7648
QSTD	m=	2.10574	QA	m=	1.31858
	b=	-0.00985		b=	-0.00612
	r=	0.99992		r=	0.99992

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

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

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

Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
Manufacturer: Sibata LD-3B
Serial No. 366410
Equipment Ref: EQ110
Job Order HK2102507

Standard Equipment:

Standard Equipment: Higher Volume Sampler
Location & Location ID: AUES office (calibration room)
Equipment Ref: HVS 018
Last Calibration Date: 8 October 2020

Equipment Verification Results:

Testing Date: 31 December 2020

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr01min	09:16 ~ 11:17	10.9	1027.0	0.058	3158	26.1
2hr01min	11:19 ~ 11:20	10.9	1027.0	0.027	1608	13.3
2hr01min	11:22 ~ 13:23	10.9	1027.0	0.026	1107	9.2

Sensitivity Adjustment Scale Setting (Before Calibration) 674 (CPM)

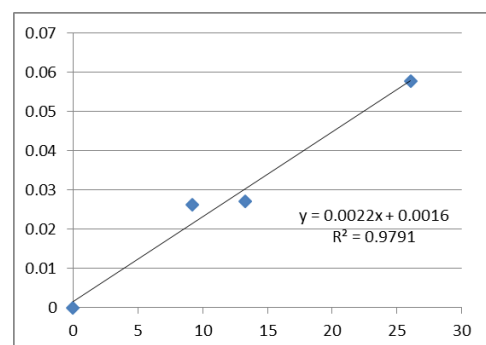
Sensitivity Adjustment Scale Setting (After Calibration) 674 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9895

Date of Issue 8 January 2021



Remarks:

- Strong** Correlation ($R > 0.8$)
 - Factor 0.0022 should be apply for TSP monitoring
- *If $R < 0.5$, repair or re-verification is required for the equipment

Operator : Fai So Signature :  Date : 8 January 2021

QC Reviewer : Ben Tam Signature :  Date : 8 January 2021

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration: 8-Oct-20
Location ID :	Calibration Room	Next Calibration Date: 8-Jan-21

CONDITIONS

Sea Level Pressure (hPa)	1015.2	Corrected Pressure (mm Hg)	761.4
Temperature (°C)	25.5	Temperature (K)	299

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.03014
Model->	5025A	Qstd Intercept ->	-0.04616
Calibration Date->	7-Feb-20	Expiry Date->	7-Feb-21

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.4	6.4	12.8	1.785	56	56.00	Slope = 38.0056 Intercept = -11.6655 Corr. coeff. = 0.9991
13	5.1	5.1	10.2	1.596	49	49.00	
10	4	4	8.0	1.416	42	42.00	
8	2.5	2.5	5.0	1.124	32	32.00	
5	1.5	1.5	3.0	0.876	21	21.00	

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

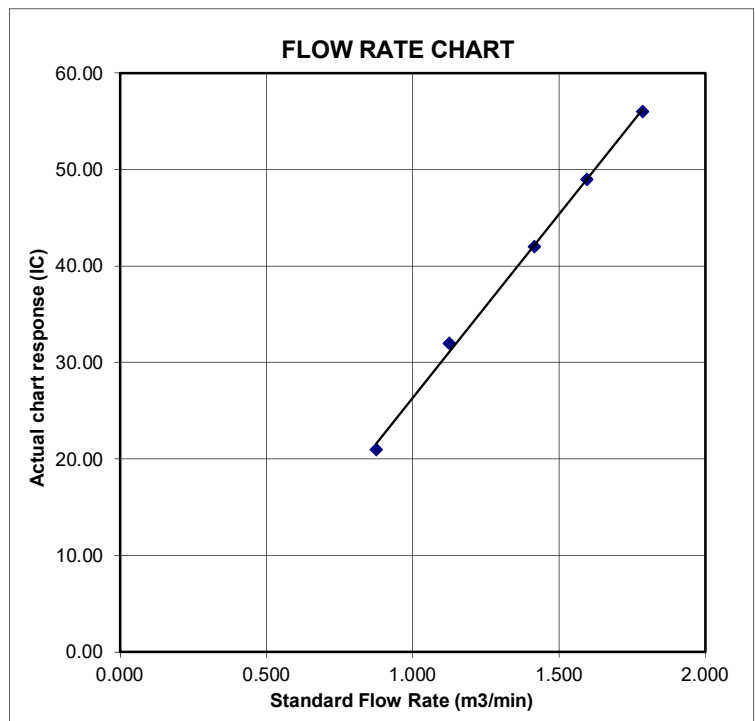
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





Certificate of Calibration

Calibration Certification Information			
Cal. Date: February 7, 2020	Rootsmeter S/N: 438320	Ta: 295	°K
Operator: Jim Tisch		Pa: 745.5	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: 1612		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3730	3.2	2.00
2	3	4	1	0.9820	6.4	4.00
3	5	6	1	0.8780	8.0	5.00
4	7	8	1	0.8340	8.8	5.50
5	9	10	1	0.6900	12.8	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H (Ta/Pa)}$ (y-axis)
0.9866	0.7186	1.4078	0.9957	0.7252	0.8896
0.9824	1.0004	1.9909	0.9914	1.0096	1.2581
0.9802	1.1165	2.2259	0.9893	1.1267	1.4066
0.9792	1.1741	2.3345	0.9882	1.1849	1.4753
0.9739	1.4114	2.8155	0.9828	1.4244	1.7792
QSTD	m=	2.03014	QA	m=	1.27124
	b=	-0.04616		b=	-0.02917
	r=	0.99995		r=	0.99995

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

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

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



ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	: HK2102511
CLIENT	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING		
ADDRESS	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH	: 1
		DATE RECEIVED	: 15-JAN-2021
		DATE OF ISSUE	: 26-JAN-2021
PROJECT	:	NO. OF SAMPLES	: 1
		CLIENT ORDER	: ---

General Comments

- Samples(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition. The result(s) related only to the item(s) tested.
- Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.
- Calibration was subcontracted to and analysed by Action United Environmental Services & Consulting.

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories

Position

Richard Fung

Managing Director

This is the Final Report and supersedes any preliminary report with this batch number.

All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd
Part of the **ALS Laboratory Group**

11/F. Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong
Tel. +852 2610 1044 Fax. +852 2610 2021 www.alsglobal.com

WORK ORDER : HK2102511
SUB-BATCH : 1
CLIENT : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT :



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK2102511-001	S/N: 3Y6503	AIR	15-Jan-2021	S/N: 3Y6503

Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
Manufacturer: Sibata LD-3B
Serial No. 3Y6503
Equipment Ref: EQ112
Job Order HK2102511

Standard Equipment:

Standard Equipment: Higher Volume Sampler
Location & Location ID: AUES office (calibration room)
Equipment Ref: HVS 018
Last Calibration Date: 8 October 2020

Equipment Verification Results:

Testing Date: 31 December 2020

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr01min	09:16 ~ 11:17	10.9	1027.0	0.058	3127	25.8
2hr01min	11:19 ~ 11:20	10.9	1027.0	0.027	1347	11.1
2hr01min	11:22 ~ 13:23	10.9	1027.0	0.026	1298	10.8

Sensitivity Adjustment Scale Setting (Before Calibration) 655 (CPM)

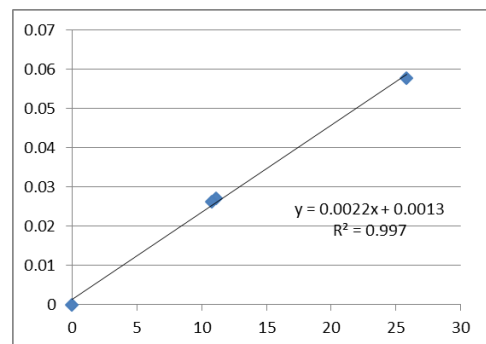
Sensitivity Adjustment Scale Setting (After Calibration) 655 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9985

Date of Issue 8 January 2021



Remarks:

- Strong** Correlation ($R > 0.8$)
 - Factor 0.0022 should be apply for TSP monitoring
- *If $R < 0.5$, repair or re-verification is required for the equipment

Operator : Fai So Signature :  Date : 8 January 2021

QC Reviewer : Ben Tam Signature :  Date : 8 January 2021

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration: 8-Oct-20
Location ID :	Calibration Room	Next Calibration Date: 8-Jan-21

CONDITIONS

Sea Level Pressure (hPa)	1015.2	Corrected Pressure (mm Hg)	761.4
Temperature (°C)	25.5	Temperature (K)	299

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.03014
Model->	5025A	Qstd Intercept ->	-0.04616
Calibration Date->	7-Feb-20	Expiry Date->	7-Feb-21

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.4	6.4	12.8	1.785	56	56.00	Slope = 38.0056 Intercept = -11.6655 Corr. coeff. = 0.9991
13	5.1	5.1	10.2	1.596	49	49.00	
10	4	4	8.0	1.416	42	42.00	
8	2.5	2.5	5.0	1.124	32	32.00	
5	1.5	1.5	3.0	0.876	21	21.00	

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

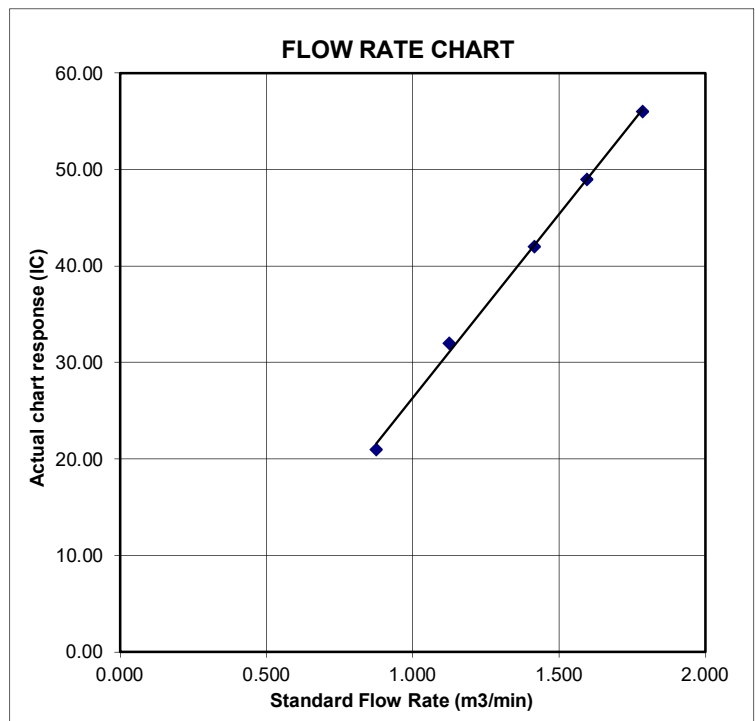
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate
 IC = corrected chart responses
 I = actual chart response
 m = calibrator Qstd slope
 b = calibrator Qstd intercept
 Ta = actual temperature during calibration (deg K)
 Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

m = sampler slope
 b = sampler intercept
 I = chart response
 Tav = daily average temperature
 Pav = daily average pressure





Certificate of Calibration

Calibration Certification Information			
Cal. Date: February 7, 2020	Rootsmeter S/N: 438320	Ta: 295	°K
Operator: Jim Tisch		Pa: 745.5	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: 1612		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3730	3.2	2.00
2	3	4	1	0.9820	6.4	4.00
3	5	6	1	0.8780	8.0	5.00
4	7	8	1	0.8340	8.8	5.50
5	9	10	1	0.6900	12.8	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H (Ta/Pa)}$ (y-axis)
0.9866	0.7186	1.4078	0.9957	0.7252	0.8896
0.9824	1.0004	1.9909	0.9914	1.0096	1.2581
0.9802	1.1165	2.2259	0.9893	1.1267	1.4066
0.9792	1.1741	2.3345	0.9882	1.1849	1.4753
0.9739	1.4114	2.8155	0.9828	1.4244	1.7792
QSTD	m=	2.03014	QA	m=	1.27124
	b=	-0.04616		b=	-0.02917
	r=	0.99995		r=	0.99995

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

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

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



Certificate of Calibration 校正證書

Certificate No. : C204359
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC20-1324) Date of Receipt / 收件日期 : 30 July 2020
Description / 儀器名稱 : Sound Level Meter (EQ013)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 00921191
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : $(23 \pm 2)^{\circ}\text{C}$ Relative Humidity / 相對濕度 : $(50 \pm 25)\%$
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 5 August 2020


TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

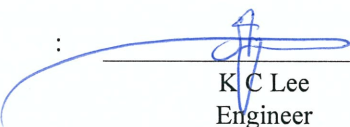
The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By
測試


K P Cheuk
Assistant Engineer

Certified By
核證


K C Lee
Engineer

Date of Issue
簽發日期

11 August 2020

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

Certificate of Calibration

校正證書

Certificate No. : C204359
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
2. Self-calibration was performed before the test.
3. The results presented are the mean of 3 measurements at each calibration point.
4. Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL280	40 MHz Arbitrary Waveform Generator	C200258
CL281	Multifunction Acoustic Calibrator	CDK1806821

5. Test procedure : MA101N.

6. Results :

- 6.1 Sound Pressure Level

- 6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	93.6	± 1.1

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L _A	A	Fast	94.00	1	93.6 (Ref.)
				104.00		103.6
				114.00		113.6

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

- 6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	93.6	Ref.
			Slow			93.6	± 0.3

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C204359

證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _A	A	Fast	94.00	63 Hz	67.3	-26.2 ± 1.5
					125 Hz	77.4	-16.1 ± 1.5
					250 Hz	84.9	-8.6 ± 1.4
					500 Hz	90.3	-3.2 ± 1.4
					1 kHz	93.6	Ref.
					2 kHz	94.8	+1.2 ± 1.6
					4 kHz	94.6	+1.0 ± 1.6
					8 kHz	92.5	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.1	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _C	C	Fast	94.00	63 Hz	92.8	-0.8 ± 1.5
					125 Hz	93.4	-0.2 ± 1.5
					250 Hz	93.6	0.0 ± 1.4
					500 Hz	93.6	0.0 ± 1.4
					1 kHz	93.6	Ref.
					2 kHz	93.4	-0.2 ± 1.6
					4 kHz	92.8	-0.8 ± 1.6
					8 kHz	90.6	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.2	-6.2 (+3.0 ; -6.0)

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C204359

證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 12910

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Sun Creation Engineering Limited – Calibration & Testing Laboratory

c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號四樓

Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

Certificate of Calibration

校正證書

Certificate No. : C205469
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC20-1324) Date of Receipt / 收件日期 : 22 September 2020

Description / 儀器名稱 : Sound Level Meter (EQ015)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 00142581
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : $(23 \pm 2)^{\circ}\text{C}$ Relative Humidity / 相對濕度 : $(50 \pm 25)\%$
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration

DATE OF TEST / 測試日期 : 29 September 2020

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification. (after adjustment)
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA
- The Bruel & Kjaer Calibration Laboratory, Denmark

Tested By : 
測試 : _____
K P Cheuk
Assistant Engineer

Certified By : 
核證 : _____
H C Chan
Engineer

Date of Issue : 30 September 2020
簽發日期

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C205469
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
2. Self-calibration using the internal standard (After Adjustment) was performed before the test 6.1.1.2 to 6.3.2.
3. The results presented are the mean of 3 measurements at each calibration point.
4. Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL280	40 MHz Arbitrary Waveform Generator	C200258
CL281	Multifunction Acoustic Calibrator	CDK1806821

5. Test procedure : MA101N.

6. Results :

- 6.1 Sound Pressure Level

- 6.1.1 Reference Sound Pressure Level

- 6.1.1.1 Before Adjustment

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	* 92.4	± 1.1

* Out of IEC 61672 Class 1 Spec.

- 6.1.1.2 After Adjustment

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	94.0	± 1.1

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L _A	A	Fast	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.2

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Certificate of Calibration

校正證書

Certificate No. : C205469

證書編號

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	94.0	Ref.
			Slow			94.0	± 0.3

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _A	A	Fast	94.00	63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.5
					250 Hz	85.3	-8.6 ± 1.4
					500 Hz	90.7	-3.2 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.6
					4 kHz	95.0	+1.0 ± 1.6
					8 kHz	93.0	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.6	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _C	C	Fast	94.00	63 Hz	93.1	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.5
					250 Hz	94.0	0.0 ± 1.4
					500 Hz	94.0	0.0 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.6
					4 kHz	93.2	-0.8 ± 1.6
					8 kHz	91.1	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.6	-6.2 (+3.0 ; -6.0)

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。



輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C205469

證書編號

- Remarks :
- UUT Microphone Model No. : UC-59 & S/N : 15585
 - Mfr's Spec. : IEC 61672 Class 1
 - Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Sun Creation Engineering Limited – Calibration & Testing Laboratory

c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 – 校正及檢測實驗室

c/o 香港新界屯門興安里一號四樓

Tel/電話: (852) 2927 2606

Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

Certificate of Calibration

校正證書

Certificate No. : C210388
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C203952
CL281	Multifunction Acoustic Calibrator	CDK1806821
TST150A	Measuring Amplifier	C201309

- Test procedure : MA100N.

- Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.25	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.000 0	1 kHz ± 0.1 %	± 0.1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.



輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C204290

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC20-1324)

Date of Receipt / 收件日期 : 30 July 2020

Description / 儀器名稱 : Sound Calibrator (EQ083)

Manufacturer / 製造商 : Rion

Model No. / 型號 : NC-74

Serial No. / 編號 : 34246492

Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : $(23 \pm 2)^{\circ}\text{C}$

Relative Humidity / 相對濕度 : $(50 \pm 25)\%$

Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 2 August 2020


TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :


- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By
測試



H T Wong
Assistant Engineer

Certified By
核證



K C Lee
Engineer

Date of Issue
簽發日期

3 August 2020

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Sun Creation Engineering Limited - Calibration & Testing Laboratory

c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號四樓

Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com



Certificate of Calibration

校正證書

Certificate No. : C204290
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C203952
CL281	Multifunction Acoustic Calibrator	CDK1806821
TST150A	Measuring Amplifier	C201309

- Test procedure : MA100N.

- Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.3	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.002	1 kHz ± 1 %	± 1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Appendix F

Event and Action Plan

Event and Action Plan for Air Quality

EVENT	ACTION			
	ET	IEC	ER	Contractor
Action Level Exceedance for One Sample	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Inform the IEC and the ER; 3. Repeat measurement to confirm findings; 4. Carry out investigation for the cause of exceedance, if the exceedance is project-related, increase monitoring frequency to daily 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method 	<ol style="list-style-type: none"> 1. Notify Contractor 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; 2. Amend working methods if appropriate
Action Level Exceedance for Two or More Consecutive Samples	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Inform the IEC and ER; 3. Repeat measurement to confirm findings; 4. Carry out investigation for the cause of exceedance, if the exceedance is project-related, increase monitoring frequency to daily 5. Discuss with IEC and Contractor on remedial action required; 6. If exceedance continues, arrange meeting with IEC and ER; 7. If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented 	<ol style="list-style-type: none"> 1. Submit proposals for remedial actions to IEC within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate
Limit Level Exceedance for One Sample	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Inform the EPD and the ER; 3. Repeat measurement to confirm findings; 4. Carry out investigation for the cause of exceedance, if the exceedance is project-related, increase monitoring frequency to daily 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if

EVENT	ACTION			
	ET	IEC	ER	Contractor
	5. Assess effectiveness of Contractor’s remedial actions and keep IEC, EPD and ER informed of results	remedial measures; 5. Supervise implementation of remedial measures		appropriate
Limit Level Exceedance for Two or More Consecutive Samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify source(s) of impact; 3. Repeat measurement to confirm findings; 4. Carry out investigation for the cause of exceedance, if the exceedance is project-related, increase monitoring frequency to daily 5. Carry out analysis of Contractor’s working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor’s remedial action and keep IEC, EPD and ER informed of the result; 8. If exceedance stop, 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. 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 stop that portion of work until the exceedance is abated	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated

Event and Action Plan for Construction Noise

EXCEEDANCE	ACTION			
	ET	IEC	ER	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals
Limit Level	<ol style="list-style-type: none"> 1. Notify IEC, ER, EPD and Contractor; 2. Identify source; 3. Carry out investigation; 4. Report the results of investigation to the IEC and Contractor; 5. Discuss with the Contractor and formulate remedial measures; 6. Increase monitoring frequency to check mitigation effectiveness 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals

Appendix G

Impact Monitoring Schedule

Impact Monitoring Schedule for the Reporting Period

Date	Noise Monitoring (0700 - 1900)	Air Quality Monitoring	
		1-Hour TSP	24-hour TSP
Thu 1-Apr-21	✓	✓	✓
Fri 2-Apr-21			
Sat 3-Apr-21			
Sun 4-Apr-21			
Mon 5-Apr-21			
Tue 6-Apr-21			
Wed 7-Apr-21	✓	✓	✓
Thu 8-Apr-21			
Fri 9-Apr-21		✓	✓ (*)
Sat 10-Apr-21			
Sun 11-Apr-21			
Mon 12-Apr-21			
Tue 13-Apr-21			✓
Wed 14-Apr-21	✓	✓	
Thu 15-Apr-21			
Fri 16-Apr-21			
Sat 17-Apr-21			
Sun 18-Apr-21			
Mon 19-Apr-21			✓
Tue 20-Apr-21	✓	✓	
Wed 21-Apr-21			
Thu 22-Apr-21			
Fri 23-Apr-21			
Sat 24-Apr-21			✓
Sun 25-Apr-21			
Mon 26-Apr-21	✓	✓	
Tue 27-Apr-21			
Wed 28-Apr-21			
Thu 29-Apr-21			✓
Fri 30-Apr-21		✓	

Remark (*) Make up sampling for 7 April 2021 at A7.

✓	Monitoring Day
	Sunday or Public Holiday

Impact Monitoring Schedule for next Reporting Period

Date		Noise Monitoring (0700 - 1900)	Air Quality Monitoring	
			1-Hour TSP	24-Hour TSP
Sat	1-May-21			
Sun	2-May-21			
Mon	3-May-21			
Tue	4-May-21			
Wed	5-May-21			✓
Thu	6-May-21	✓	✓	
Fri	7-May-21			
Sat	8-May-21			
Sun	9-May-21			
Mon	10-May-21			
Tue	11-May-21			✓
Wed	12-May-21	✓	✓	
Thu	13-May-21			
Fri	14-May-21			
Sat	15-May-21			
Sun	16-May-21			
Mon	17-May-21			✓
Tue	18-May-21	✓	✓	
Wed	19-May-21			
Thu	20-May-21			
Fri	21-May-21			
Sat	22-May-21			✓
Sun	23-May-21			
Mon	24-May-21	✓	✓	
Tue	25-May-21			
Wed	26-May-21			
Thu	27-May-21			
Fri	28-May-21			✓
Sat	29-May-21		✓	
Sun	30-May-21			
Mon	31-May-21			

✓	Monitoring Day
	Sunday or Public Holiday

Appendix H

Database of Monitoring Result

24-hour TSP Monitoring Data

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP (°C)	AVG AIR PRESS (hPa)	STANDARD FLOW RATE (m ³ /min)	AIR VOLUME (std m ³)	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED (g)	24-Hr TSP (µg/m ³)	ACTION LEVEL (µg/m ³)	LIMIT LEVEL (µg/m ³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG					INITIAL	FINAL				
A4 – No. 101 Lung Mei Tsuen																	
1-Apr-21		# Power failure														142	260
7-Apr-21		# Power failure														142	260
13-Apr-21		# Power failure														142	260
19-Apr-21		# Power failure														142	260
24-Apr-21		# Power failure														142	260
29-Apr-21		# Power failure														142	260
A7 – Hong Kong Eco-Farm																	
1-Apr-21		# Power failure														141	260
9-Apr-21 (*)	26958	17270.64	17294.64	1440.00	42	42	42.0	26.7	1007.6	1.32	1901	2.6521	2.7570	0.1049	55	141	260
13-Apr-21	27030	17294.64	17318.64	1440.00	42	42	42.0	25.9	1013.6	1.32	1907	2.8259	2.8900	0.0641	34	141	260
19-Apr-21	26786	17318.64	17342.64	1440.00	42	42	42.0	22.5	1013.2	1.33	1916	2.7780	2.8086	0.0306	16	141	260
24-Apr-21	27034	17342.64	17366.64	1440.00	42	42	42.0	25.4	1010.9	1.32	1907	2.7811	3.0421	0.2610	137	141	260
29-Apr-21	26998	17366.64	17390.64	1440.00	42	42	42.0	23.2	1014.5	1.33	1915	2.8055	2.8600	0.0545	28	141	260

Remark (#) power failure for HVS; (*) make up sampling for 7 Apr 2021.

One-hour TSP Monitoring Data

Date	Start Time	End Time	1 st reading	2 nd reading	3 rd reading	Action Level (µg/m ³)	Limit Level (µg/m ³)
A4 - No. 101 Lung Mei Tsuen							
1-Apr-21	9:25	12:25	61	68	65	275	500
7-Apr-21	9:14	12:14	70	72	76	275	500
9-Apr-21	14:08	17:08	65	64	69	275	500
14-Apr-21	13:13	16:13	70	65	64	275	500
20-Apr-21	9:31	12:31	72	65	69	275	500
26-Apr-21	9:16	12:16	61	54	60	275	500
30-Apr-21	13:21	16:21	80	75	77	275	500
A7 - Hong Kong Eco-Farm							
1-Apr-21	9:18	12:18	65	70	71	274	500
7-Apr-21	9:07	12:07	68	70	65	274	500
9-Apr-21	14:30	17:30	74	71	72	274	500
14-Apr-21	13:25	16:25	69	67	65	274	500
20-Apr-21	9:25	12:25	75	80	73	274	500
26-Apr-21	9:10	12:10	66	68	61	274	500
30-Apr-21	13:30	16:30	85	70	73	274	500

Construction Noise Monitoring Results, dB(A)

Date	Start Time	1 st Leq _{5min}	L10	L90	2 nd Leq _{5min}	L10	L90	3 rd Leq _{5min}	L10	L90	4 th Leq _{5min}	L10	L90	5 th Leq _{5min}	L10	L90	6 th Leq _{5min}	L10	L90	Leq30	façade correction	Limit Level (dB(A))
N1 - Village house - No. 165A Lung Mei																						
1-Apr-21	9:25	62.1	63.2	60.4	64.3	65.7	62.4	62.6	62.9	60.2	62.4	64.1	60.3	61.5	63	60.1	62.9	64.4	60.8	63	66	75
7-Apr-21	14:08	54.4	58.8	47.4	51.9	55.9	45.5	56.6	62.3	44.8	61.6	64.3	44.3	53.5	56.7	45.9	55.3	60.1	44.2	57	60	75
14-Apr-21	13:10	56.6	60.5	48.5	50.9	55.4	43.1	60.6	65.4	46.2	51.1	55.3	42.4	54.6	59.2	41.9	54.8	58.9	47.3	56	59	75
20-Apr-21	9:40	61.9	63.6	56.8	65.5	66.0	58.1	61.2	62.6	56.3	65.4	67.9	56.0	59.6	61.0	54.0	57.9	61.4	53.4	63	66	75
26-Apr-21	9:00	60.6	62.0	53.5	63.0	63.0	53.0	57.4	57.0	53.0	55.7	58.0	53.0	54.5	55.5	53.0	54.7	57.0	52.5	59	62	75
N2a - Village house - No. 101 Lung Mei																						
1-Apr-21	10:05	62.6	62.9	60.3	62.9	63.6	60.5	65.9	67	61.1	65.5	67	61.9	64.7	66.8	63.6	64.8	66.7	61	65	N/A	75
7-Apr-21	14:38	56.4	60.3	47.8	58.6	63.0	46.3	51.9	55.0	45.8	58.5	62.9	47.6	56.5	61.2	46.6	56.7	59.3	51.8	57	N/A	75
14-Apr-21	13:40	53.7	56.6	42.4	55.1	59.5	45.0	55.0	59.1	44.5	59.2	61.9	45.8	58.0	61.9	46.7	54.4	59.1	41.2	56	N/A	75
20-Apr-21	10:16	63.5	65.8	61.5	64.6	66.7	62	65.2	66.8	62.4	64.6	66.1	62.5	65.5	67.8	62.6	66.2	68	62.5	65	N/A	75
26-Apr-21	9:31	65.6	66.0	58.0	59.8	62.0	56.0	59.0	562.0	52.0	65.2	66.5	59.5	62.0	65.0	55.5	65.1	67.5	59.5	64	N/A	75
N3a - Village house - No. 66C Lo Tsz Tin																						
1-Apr-21	10:45	63.3	65	60	65.5	68.5	63.2	64.4	66.4	62	65.3	68.5	62	62.3	64.5	59.5	62.4	65.1	59	64	67	75
7-Apr-21	15:20	53.6	52.4	47.0	48.2	49.6	44.2	47.7	50.1	43.8	49.5	52.2	46.3	50.5	54.3	43.1	49.8	53.6	42.1	50	53	75
14-Apr-21	14:21	46.8	49.3	43.0	50.7	53.4	45.8	49.0	52.4	45.4	45.6	47.4	43.6	46.9	49.4	43.8	46.8	49.7	43.3	48	51	75
20-Apr-21	10:50	64.2	67	58.6	65	68.1	59.5	63.7	66.6	58.3	63.1	66.5	55.9	64.5	67.7	58.7	65.8	67.3	59.4	64	67	75
26-Apr-21	10:17	56.5	58.5	51.5	55.2	57.0	51.0	57.7	59.0	50.0	56.3	56.5	50.5	57.4	64.5	57.5	60.5	58.5	52.0	58	61	75
N4 - Village house - No. 79 Lo Tsz Tin																						
1-Apr-21	11:25	56.8	61.5	45.5	54.0	57.0	46.0	54.0	59.0	45.5	50.2	53.5	45.0	52.4	52.5	54.5	48.1	49.5	45.5	53	N/A	75
7-Apr-21	16:07	57.7	61.4	46.4	57.1	61.5	46.2	58.3	61.8	45.2	58.1	61.7	48.6	58.2	61.8	48.1	58.9	63.9	42.2	58	N/A	75
14-Apr-21	15:00	58.8	61.9	48.4	58.9	62.4	49.5	59.5	62.4	50.6	58.7	61.5	49.8	57.2	60.8	50.0	58.8	62.2	52.9	59	N/A	75
20-Apr-21	11:26	60.5	62.3	55.5	58.9	61.5	54.5	53.3	60.5	50.9	61.9	63.0	59.5	59.3	62.0	56.8	60.1	62.5	59.5	60	N/A	75
26-Apr-21	10:54	60.1	61.5	54.5	59.3	59.5	55.5	59.3	61.0	54.0	56.9	59.0	54.0	57.1	58.5	55.0	52.9	65.5	58.5	58	N/A	75

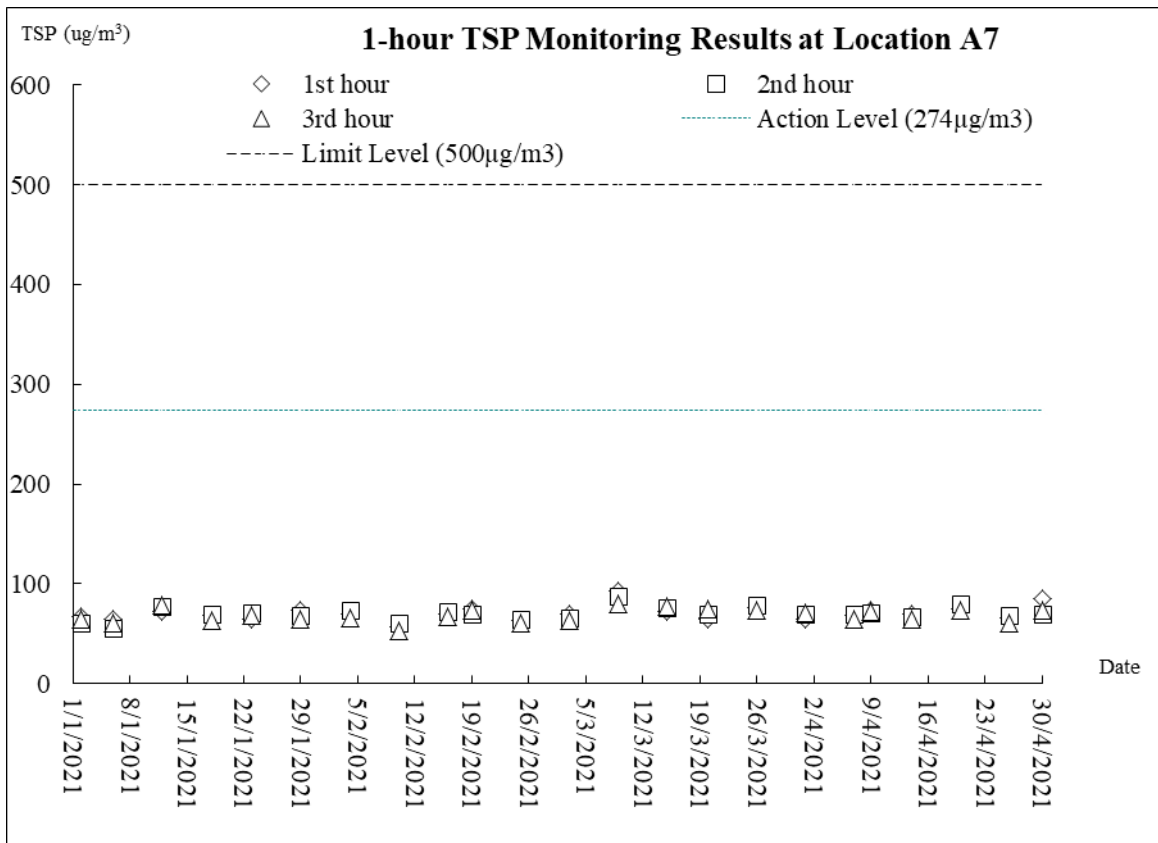
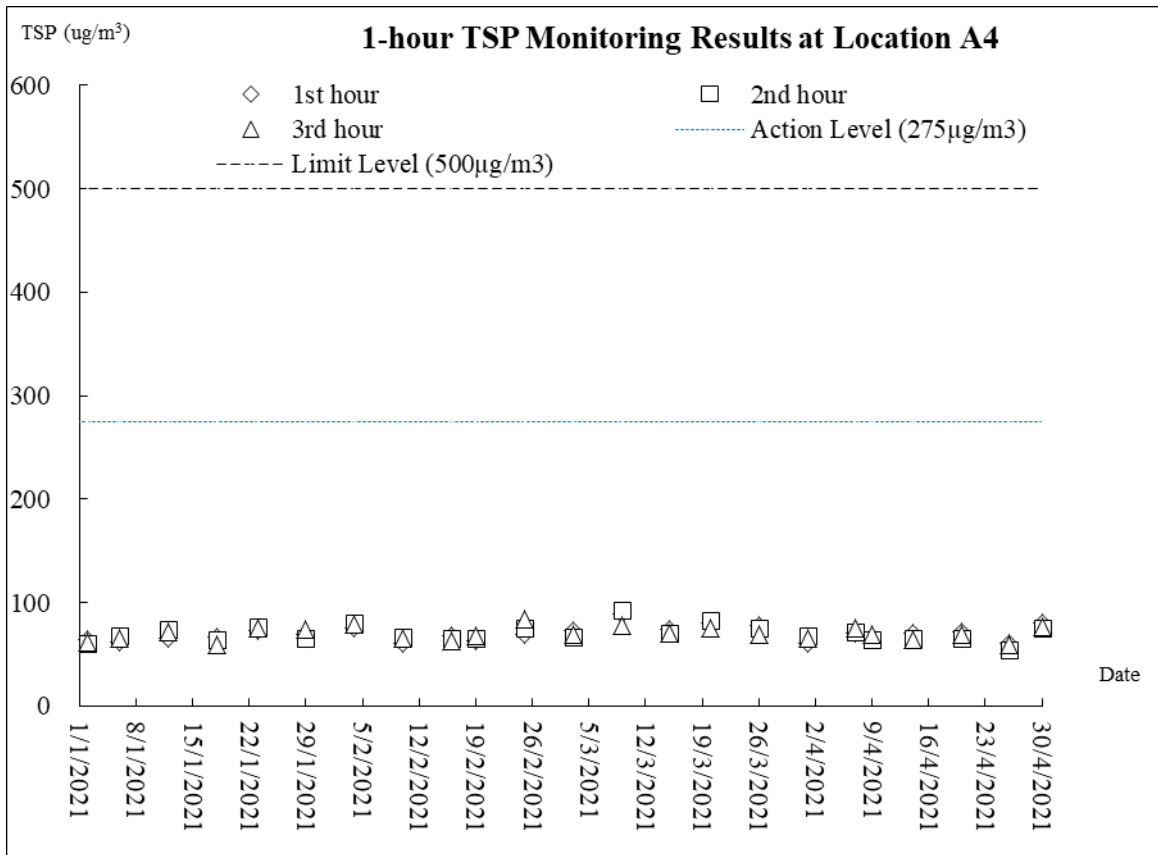
Remark:

Sound level meter set at N1 and N3a are made free-field measurement, façade correction (+3dB(A)) has added according to acoustical principles and EPD guidelines;

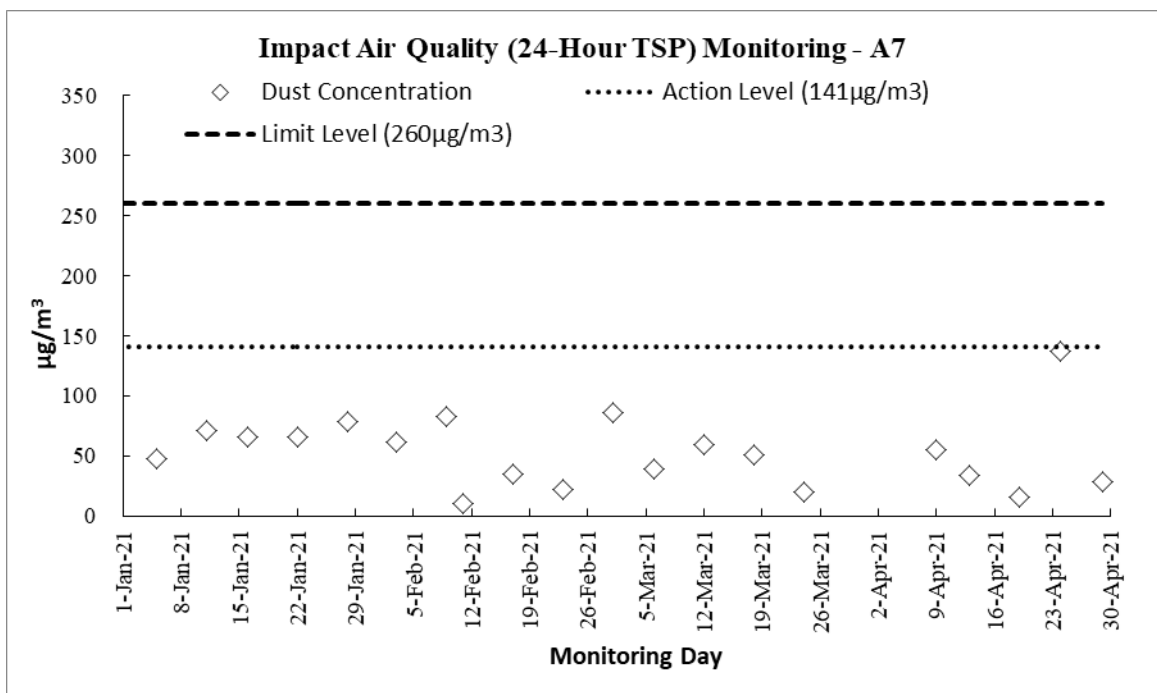
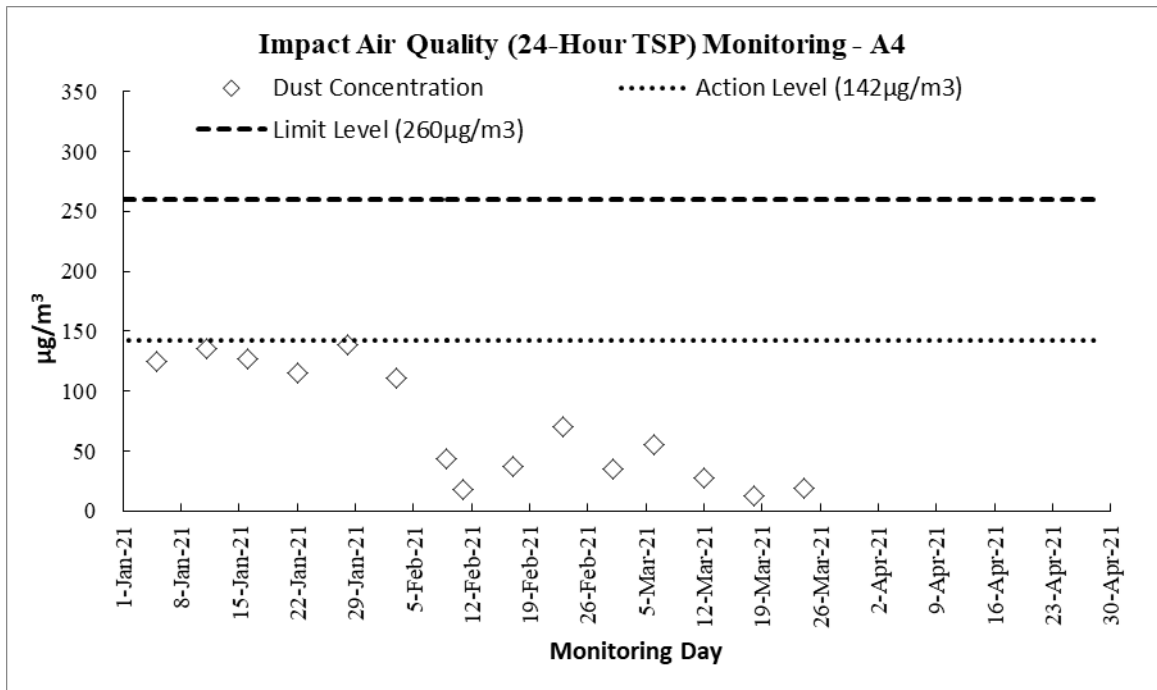
Appendix I

Graphical Plots for Monitoring Results

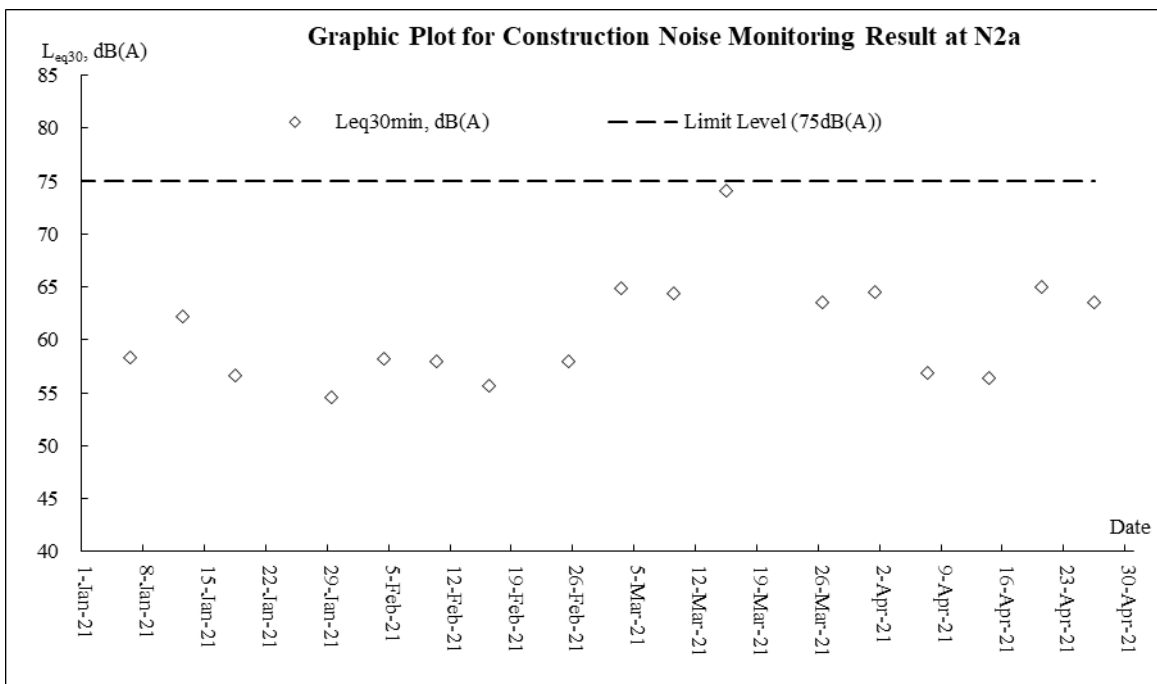
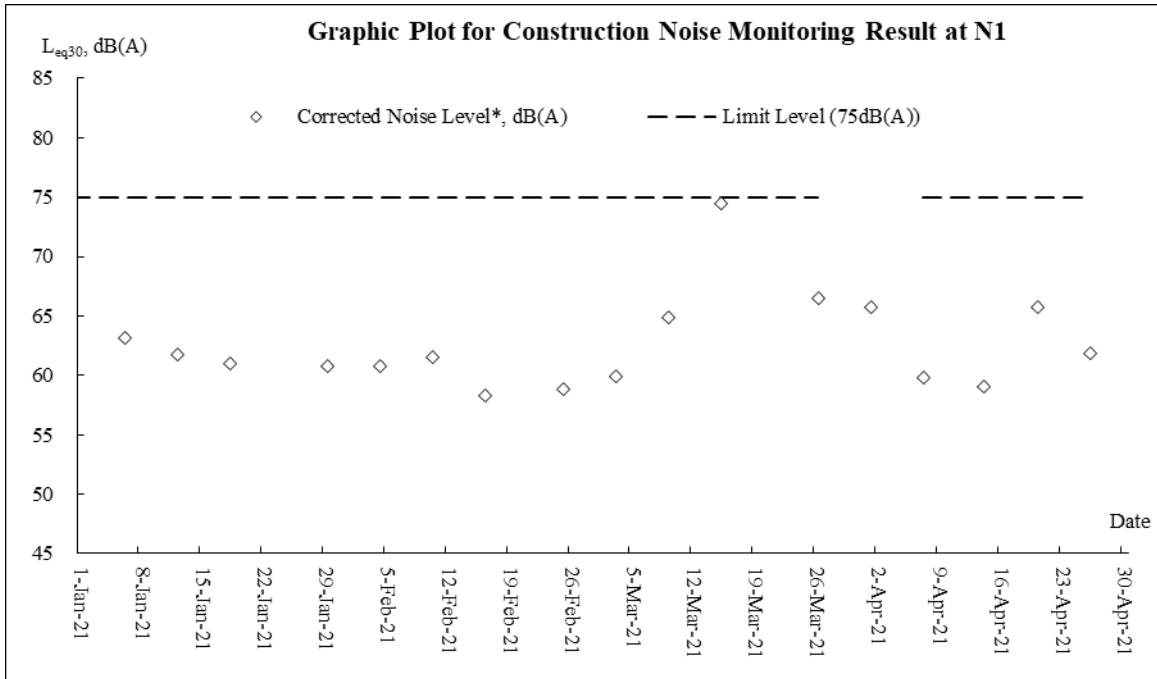
Air Quality – 1-hour TSP

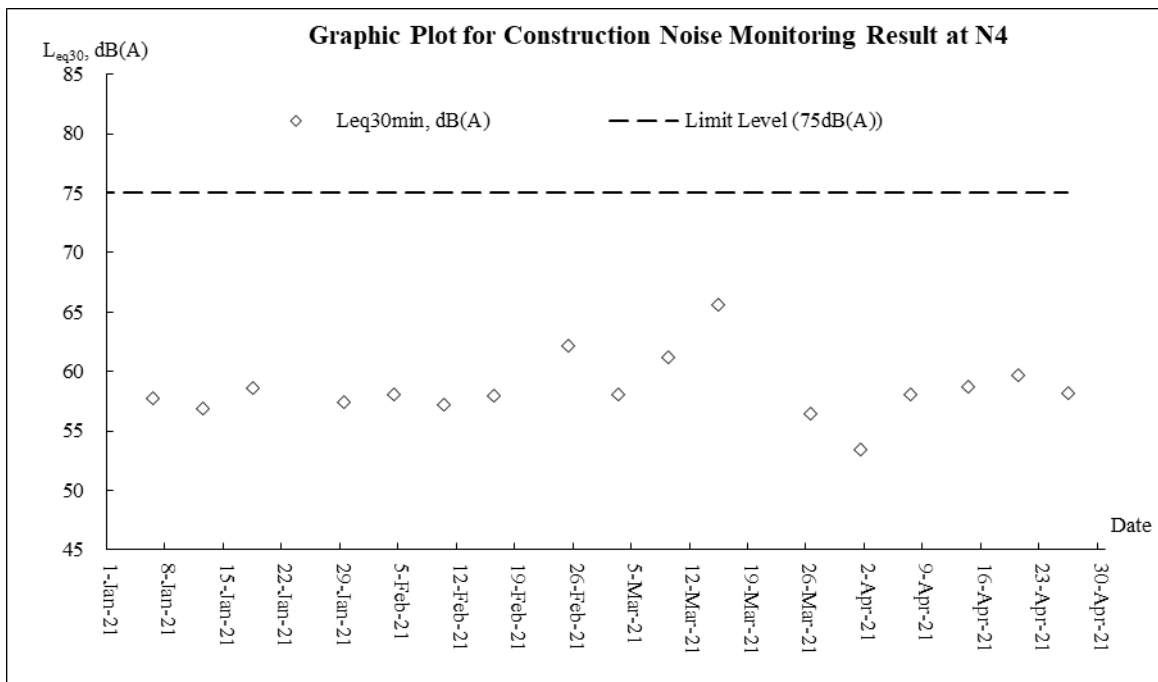
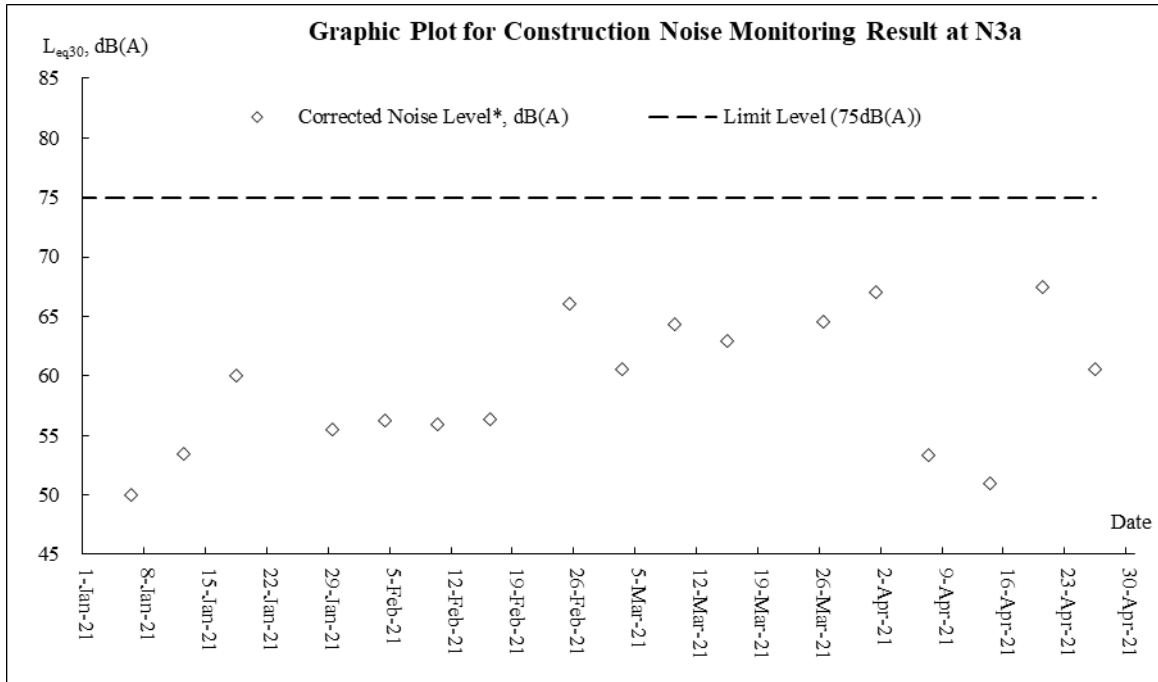


Air Quality – 24-hour TSP



Construction Noise





Appendix J

Meteorological Data

Date		Weather	Total Rainfall (mm)	Tai Po Station		Tai Mei Tuk Station	
				Mean Air Temp. (°C)	Mean Relative Humidity (%)	Wind Speed (km/h)	Wind Direction
1-Apr-21	Thu	Mainly cloudy with one or two showers.	Trace	27.7	73.7	13.7	S/SE
2-Apr-21	Fri	Cloudy with a few showers.	0	27.5	69.7	11.7	S/SE
3-Apr-21	Sat	Fine. Hot. Light winds.	0	27.5	71	12.5	E
4-Apr-21	Sun	Moderate easterly winds, strengthening gradually overnight	0.8	24.3	70.5	10.7	E/SE
5-Apr-21	Mon	Moderate east to northeasterly winds, occasionally fresh offshore.	0.7	21.4	69.7	10.0	E
6-Apr-21	Tue	Sunny intervals at first tomorrow and a few showers later.	0	23.3	78	12.0	SE
7-Apr-21	Wed	Becoming cloudy tonight.	0	22.5	77.5	20.0	E
8-Apr-21	Thu	Cloudy with a few showers.	0	22.2	76.2	17.5	E
9-Apr-21	Fri	Cloudy with one or two rain patches.	7.5	19.6	87.5	17.0	NE
10-Apr-21	Sat	Moderate to fresh east to northeasterly winds	0	21.6	81	16.9	E/SE
11-Apr-21	Sun	Fine. Hot. Light winds.	0	22.6	73.5	11.5	SE
12-Apr-21	Mon	Mainly cloudy with one or two showers.	0	26.1	81	8.9	E/NE
13-Apr-21	Tue	Mainly cloudy with one or two showers.	0	25	79	7.0	SE
14-Apr-21	Wed	Becoming cloudy tonight.	Trace	23.7	86.2	11.2	E
15-Apr-21	Thu	Cloudy with a few showers.	8.3	21.5	89.5	21.5	E
16-Apr-21	Fri	Moderate northerly winds.	1.5	Maintenance	Maintenance	14.0	E
17-Apr-21	Sat	Light winds tomorrow.	2.5	22.4	61	22.5	E
18-Apr-21	Sun	Moderate to fresh easterly winds	Trace	23.8	59	27.0	E
19-Apr-21	Mon	Fine. Hot. Light winds.	0	22.9	61.2	30.0	E
20-Apr-21	Tue	Light winds tomorrow.	0	23.4	67.7	22.5	E
21-Apr-21	Wed	Fine. Hot. Light winds.	0	24.3	71.2	12.5	S/SE
22-Apr-21	Thu	Cloudy periods overnight.	0	25.9	68.7	8.5	E/SE
23-Apr-21	Fri	Moderate northerly winds.	0	27	73.5	6.2	SE
24-Apr-21	Sat	Light winds tomorrow.	Trace	24.5	77	10.5	SE
25-Apr-21	Sun	Moderate to fresh easterly winds	0.9	23.6	88.5	16.0	E
26-Apr-21	Mon	Mainly cloudy with a few showers.	0.3	22.7	80	23.0	E
27-Apr-21	Tue	Cloudy periods overnight.	5.7	22.5	90	21.5	E/NE
28-Apr-21	Wed	Fine and hot during the day tomorrow.	4.2	24	85	10.0	E/NE
29-Apr-21	Thu	Moderate to fresh easterly winds	0.1	23.9	76	11.2	S/SE
30-Apr-21	Fri	occasionally strong offshore at first.	0	25	72.5	11.0	SE

Appendix K
Waste Flow Table

Appendix L

**Implementation Schedule for
Environmental Mitigation Measures**

EIA Ref.	EM&A Ref	Environmental Protection Measures	Objectives of the Recommended Measure & Main Concerns to address	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Relevant Legislation Guidelines
						Des	C	O	Dec	
<i>Air Quality – Construction Phase</i>										
4.5.1	-	<u>Dust Control</u>								
		a Vehicle washing facilities should be provided at the designated vehicle exit point;	To ensure dust emission is controlled and compliance with relevant statutory requirements	Project Site / During construction	Contractor	✓				<i>Air Pollution Control (Construction Dust) Regulations</i>
		b Every vehicle should be washed to remove any dusty materials from its body and wheels immediately before leaving the worksite;								
		c The load carried by the trucks should be covered entirely to ensure no leakage from the vehicles;								
		d Hoarding of not less than 2.4 m high from ground level should be provided along the entire length of that portion of the site boundary adjoining a road or other area accessible to the public except for a site entrance or exit;								
		e The main haul road should be kept clear of dusty materials and should be sprayed with water so as to maintain the entire road surface wet at all the time;								
		f The stockpile of dusty materials should be either covered entirely by								

EIA Ref.	EM&A Ref	Environmental Protection Measures	Objectives of the Recommended Measure & Main Concerns to address	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Relevant Legislation Guidelines	
						Des	C	O	Dec		
		impervious sheets; place in an area sheltered on the top and three sides; or sprayed with water to maintain the entire surface wet at all the time; g Belt conveyor system should be enclosed on the top and two sides; h The height of the belt conveyor should be kept as low as possible to avoid delivery at height; and i All the exposed area should be kept wet always to minimise dust emission.									
4.5.1	-	<u>Air Quality Control</u>									
		a All dump trucks entering or leaving the Project Site should be provided with mechanical covers in good service condition; and	To ensure air quality standards compliance with relevant statutory requirements	Project Site / During construction	Contractor				✓		ETWB TCW No 19/2005
		b Ultra-low-sulphur diesel (ULSD) should be used for all construction plant on site.									
4.7.1	-	<u>EM&A Requirements</u>									
		Regular site audits (at a frequency of not									

EIA Ref.	EM&A Ref	Environmental Protection Measures	Objectives of the Recommended Measure & Main Concerns to address	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Relevant Legislation Guidelines
						Des	C	O	Dec	
		less than once every two weeks) are recommended.	To ensure that appropriate dust control measures are implemented and good site practices are adopted	Project Site / During construction	ET and Contractor		✓			<i>Air Pollution Control (Construction Dust) Regulations</i>
4.7.1	3.0-3.7	Implementation of a construction dust monitoring in every six days	To ensure compliance with the relevant criterion during the construction works.	ASRs A4 (No. 101 Lung Mei Tsuen) and A6 (No. 79 Lo Tsz Tin tsuen) / during construction	ET and Contractor		✓			<i>Air Pollution Control (Construction Dust) Regulations</i>
Noise – Construction Phase										
5.6.1		Site hoardings at the particular work site boundary may be provided for achieving screening effect, provided that the hoardings have no openings or gaps and meet the same specifications for movable noise barriers. The proposed movable noise barriers should be at least 3m high with a surface density of not less than 7 kg m ⁻² , which could provide a minimum of 5 dB(A) attenuation. Skid footing of movable noise barriers should be located at a distance not more than a few metres of stationary plant and mobile plant such that the NSRs would not have direct line of sight to the plant. The length of the barriers should also be at least five times greater than its height.	To reduce the construction noise impact.	Project Site / During construction	ET and Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1	-	The following Quiet Powered Mechanical	To reduce the construction	Project Site / During	Contractor		✓			<i>Noise Control</i>

EIA Ref.	EM&A Ref	Environmental Protection Measures	Objectives of the Recommended Measure & Main Concerns to address	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Relevant Legislation Guidelines
						Des	C	O	Dec	
(Table 5.12)		Equipment (PME) should be used during the construction Phase. <ul style="list-style-type: none"> • Mobile Crane, SWL listed in the data base of quality powered mechanical equipment prepared by the Noise Control Authority, 107 dB(A); • Tracked Loader, British Standard 5228 – Table C3, Reference No. 16, 104 dB(A); • Pneumatic breaker, British Standard 5228 – Table C2, Reference No. 10, 110 dB(A); • Concrete Lorry Mixer British Standard 5228 – Table C6, Reference No. 23, 100 dB(A); and • Excavator British Standard 5228 - Table C3, Reference No. 97, 105 dB(A). 	noise impact.	construction phase					<i>Ordinance (NCO) and Annex 5 of the EIAO-TM</i>	
5.7.1 (Table 5.13)	-	<u>Construction Works on Land</u> Movable noise barrier should be provided for excavator and mobile crane; Timber sawing machine should be operated behind site hoarding/ movable noise barrier; and Concrete lorry mixer should be operated behind site hoarding/movable noise barrier.	To reduce the construction noise impact.	Project Site / During the Site Formation, construction of seawall, ramp, staircase, retaining walls, sump tanks for grey water system and superstructure	Contractor		✓		<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>	

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						Des	C	O	Dec	
5.7.1 (Table 5.13)	-	Timber sawing machine should be operated behind movable noise barrier; and Movable noise barrier should be provided for excavator and mobile crane.	To reduce the construction noise impact.	Project Site / During the localised road widening works along Ting Kok Road foundation	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1 (Table 5.13)	-	<u>Car Park Paving</u> Movable noise barrier should be provided for excavator.	To reduce the construction noise impact.	Project Site / During the car park paving	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1 (Table 5.13)	-	<u>Building Works</u> Movable noise barrier should be provided for excavator, mobile crane and earth auger; and Timber sawing machine should be operated behind site hoarding/ movable noise barrier.	To reduce the construction noise impact.	Project Site / During foundation and tanking works	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1 (Table 5.13)	-	Movable noise barrier should be provided for mobile crane; and Timber sawing machine should be operated behind site hoarding/ movable noise barrier.	To reduce the construction noise impact.	Project Site / During superstructure works	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>

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						Des	C	O	Dec	
5.7.1 (Table 5.13)	-	Movable noise barrier should be provided for mobile crane.	To reduce the construction noise impact.	Project Site / During building finishes & internal fitting-out	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1 (Table 5.13)	-	<u>Rock filling for the Groynes</u> Movable noise barrier should be provided for excavator and derrick lighter.	To reduce the construction noise impact.	Project Site / During the construction of gabion channel	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1 (Table 5.13)	-	<u>Box Culvert Construction</u> Movable noise barrier should be provided for excavator.	To reduce the construction noise impact.	Project Site / During the construction of gabion channel	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1 (Table 5.13)	-	Movable noise barrier should be provided for excavator, mobile crane; and Concrete lorry mixer should be operated behind site hoarding/movable noise barrier.	To reduce the construction noise impact.	Project Site / During the construction of western culvert	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1 (Table 5.13)	-	Concrete lorry mixer should be operated behind site hoarding/movable noise barrier.	To reduce the construction noise impact.	Project Site / During the construction of eastern culvert	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1	-	Site hoarding should be provided for work	To reduce the construction	Project Site / During	Contractor		✓			<i>Noise Control</i>

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(Table 5.13)		site.	noise impact.	the construction of 90m box culvert						<i>Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1 (Table 5.13)	-	<u>Sand Filling</u> Movable noise barrier should be provided for excavator.	To reduce the construction noise impact.	Project Site / During the construction of gabion channel	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
5.7.1	-	<u>Good Site Practice</u> Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction programme; Mobile plant, if any, should be sited as far from NSRs as possible; Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; Plant known to emit noise strongly in one direction should, wherever possible, be	To reduce the construction noise impact.	Project Site / Throughout the construction period	Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>

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						Des	C	O	Dec	
		orientated so that the noise is directed away from the nearby NSRs; and Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities.								
5.9.1	4.1	<u>EM&A Requirements</u> Implementation of weekly construction noise monitoring at the representative NSRs.	To ensure compliance with the relevant criterion during the construction works.	N1, N2/N2a, N3 & N4/ Throughout the construction period	ET and Contractor		✓			<i>Noise Control Ordinance (NCO) and Annex 5 of the EIAO-TM</i>
Water Quality – Construction Phase										
6.6.1	-	<u>Dredging and Sandfilling Operations</u> Sandfilling works should be carried out after the completion of groyne construction.	To further minimise the SS level during sandfilling works	Project Site / During sandfilling	Contractor		✓			-
6.6.1 and Figure 6.20	-	A movable cage type / metal frame type silt curtain will be deployed around the dredging area next to the grab dredger prior to commencement of dredging works.	To further minimise the SS level during the dredging and sandfilling works	Project Site / During dredging and sandfilling	Contractor		✓			<i>Annex 6 of the EIAO-TM</i>
6.6.1 and Figure 6.21	-	Standing type silt curtains will be deployed around the proposed sandfilling extent prior to commencement of sandfilling works.	To further minimise the SS level during the dredging and sandfilling works	Project Site / During dredging and sandfilling	Contractor		✓			<i>Annex 6 of the EIAO-TM</i>
6.6.1	-	A hourly dredging rate of a closed grab dredger (with a minimum grab size of 3 m ³) should be less than 31 m ³ hr ⁻¹ , with	To further minimise the SS level during the dredging works	Project Site / During dredging	Contractor		✓			-

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						Des	C	O	Dec	
		reference to the maximum rate for dredging, which was derived in the EIA.								
6.6.1	-	A daily filling rate should be less than 1,000 m ³ day ⁻¹ , which was defined in the EIA.	To further minimise the SS level during the sandfilling works	Project Site / During sandfilling	Contractor		✓			-
6.6.1	-	Mechanical grabs should be designed and maintained to avoid spillage and should seal tightly while being lifted.	To further minimise the SS level during the dredging works	Project Site / During dredging	Contractor		✓			-
6.6.1	-	Barges or hoppers should have tight fitting seals to their bottom openings to prevent leakage of material.	To further minimise the SS level during the dredging and sandfilling works	Project Site / During dredging and sandfilling	Contractor		✓			-
6.6.1	-	Loading of barges or hoppers shall be controlled to prevent splashing of dredged material to the surrounding water.	To further minimise the SS level during the dredging works	Project Site / During dredging	Contractor		✓			-
6.6.1	-	Barges or hoppers should not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation.	To further minimise the SS level during the dredging and sandfilling works	Project Site / During dredging and sandfilling	Contractor		✓			-
6.6.1	-	Excess material should be cleaned from the decks and exposed fittings of barges or hoppers before the vessel is moved.	To further minimise the SS level during the dredging and sandfilling works	Project Site / During dredging and sandfilling	Contractor		✓			-
6.6.1	-	Adequate freeboard should be maintained on barges to reduce the likelihood of decks being washed by wave action.	To further minimise the SS level during the dredging and sandfilling works	Project Site / During dredging and sandfilling	Contractor		✓			-
6.6.1	-	All vessels should be sized such that adequate clearance is maintained between vessels and the seabed at all states of the	To further minimise the SS level during the dredging and sandfilling works	Project Site / During dredging and sandfilling	Contractor		✓			-

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						Des	C	O	Dec	
		tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash.								
6.6.1	-	The works should not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the Project Site.	To further minimise the SS level during the dredging and sandfilling works	Project Site / During dredging and sandfilling	Contractor		✓			<i>ProPECC PN 1/94</i>
6.6.1	-	<u>Construction Site Runoff</u> The excavation works for the drainage diversions should be carried out to minimise any seawater influx entering the works area and hence to keep the works area dry as much as possible.	To ensure the works area will be kept dry as much as possible and hence avoid construction site runoff	Project Site / During excavation for the drainage diversions	Contractor		✓			-
6.6.1 and Figure 6.21	-	Silt curtains at the inshore waters should be deployed to enclose the works area before the commencement of the excavation works for two drainage diversions until the completion of the diversions.	To avoid any adverse water quality impacts resulting from the site runoff due to heavy rainfall	Project Site / During excavation for the drainage diversions	Contractor		✓			-
6.6.1	-	At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed and internal drainage works and erosion and sedimentation control facilities implemented. Channels, earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities. The design of efficient silt removal facilities should be based on the guidelines in <i>Appendix A1</i> of <i>ProPECC PN 1/94</i> .	To minimise the construction site runoff	Project Site / During land based construction works	Contractor		✓			<i>ProPECC PN 1/94</i>
6.6.1	-	All the surface runoff should be collected by	To minimise the	Project Site / During	Contractor		✓			<i>ProPECC PN</i>

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						Des	C	O	Dec	
		the on-site drainage system and diverted through the silt traps prior to discharge into storm drain.	construction site runoff	land based construction works						1/94
6.6.1	-	All exposed earth areas should be completed as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks, where practicable. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or by other means.	To minimise the construction site runoff	Project Site / During land based construction works	Contractor		✓			ProPECC PN 1/94
6.6.1	-	All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas.	To minimise the construction site runoff	Project Site / During land based construction works	Contractor		✓			ProPECC PN 1/94
6.6.1	-	Measures should be taken to reduce the ingress of site drainage into excavations. If the excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal	To minimise the construction site runoff	Project Site / During land based construction works	Contractor		✓			ProPECC PN 1/94

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		facilities.								
6.6.1	-	Open stockpiles of construction materials (for example, aggregates, sand and fill material) of more than 50 m ³ should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.	To minimise the construction site runoff	Project Site / During land based construction works	Contractor		✓			<i>ProPECC PN 1/94</i>
6.6.1	-	Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system.	To minimise the construction site runoff	Project Site / During land based construction works	Contractor		✓			<i>ProPECC PN 1/94</i>
6.6.1	-	Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarised in <i>Appendix A2 of ProPECC PN 1/94</i> . Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.	To minimise the construction site runoff	Project Site / During land based construction works	Contractor		✓			<i>ProPECC PN 1/94</i>
6.6.1	-	Oil interceptors should be provided in the	To minimise the	Project Site / During	Contractor		✓			<i>ProPECC PN</i>

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						Des	C	O	Dec	
		drainage system and regularly emptied to prevent the release of oil and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain.	construction site runoff	land based construction works						1/94
6.6.1	-	All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge should be adequately designed for the controlled release of storm flows. All sediment traps should be regularly cleaned and maintained. The temporary diverted drainage should be reinstated to the original condition when the construction work has finished or the temporary diversion is no longer required.	To minimise the construction site runoff	Project Site / During land based construction works	Contractor		✓			ProPECC PN 1/94
6.6.1	-	<u>Sewage Generated by Workforce</u> Sewage from toilets should be collected by a licensed waste collector.	To prevent contamination to nearby environment	Project Site / During land based construction works	Contractor		✓			Water Pollution Control Ordinance
6.6.1	-	<u>Storage and Handling of Oil, Other Petroleum Products and Chemicals</u> Waste streams classifiable as chemical wastes should be properly stored, collected and treated for compliance with <i>Waste Disposal Ordinance or Disposal (Chemical Waste) (General) Regulation</i> requirements.	To prevent contamination to nearby environment	Project Site / During land based construction works	Contractor		✓			Waste Disposal Ordinance
6.6.1	-	All fuel tanks and chemical storage areas should be provided with locks and be sited	To prevent contamination to	Project Site / During land based construction	Contractor		✓			Waste Disposal

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						Des	C	O	Dec		
		on paved areas.	nearby environment	works						<i>Ordinance</i>	
6.6.1	-	The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled oil, fuel and chemicals from reaching the receiving waters.	To prevent contamination to nearby environment	Project Site / During land based construction works	Contractor				✓		<i>Waste Disposal Ordinance</i>
6.6.1	-	Oil leakage or spillage should be contained and cleaned up immediately. Waste oil should be collected and stored for recycling or disposal, in accordance with the <i>Waste Disposal Ordinance</i> . The Contractors should prepare guidelines and procedures for immediate clean-up actions following any spillages of oil, fuel or chemicals.	To prevent contamination to nearby environment	Project Site / During land based construction works	Contractor				✓		<i>Waste Disposal Ordinance</i>
6.6.1	-	Vehicle and plant servicing areas, vehicle wash bays and lubrication bays should, as far as possible, be located within roofed areas. The drainage in these covered areas should be connected to foul sewers via a petrol interceptor.	To prevent contamination to nearby environment	Project Site / During land based construction works	Contractor				✓		<i>Waste Disposal Ordinance</i>
6.9.1 and 11.6.1	5.1	<u>EM&A Requirements</u> Monitoring of marine water quality during the construction phase is considered necessary to evaluate whether any impacts would be posed by these marine works on the surrounding waters during the operation of dredging and filling works.	To ensure the construction works would not arise any impacts to the surrounding waters	Marine water outside the Project Site / During dredging and filling works	ET and Contractor				✓		-

EIA Ref.	EM&A Ref	Environmental Protection Measures	Objectives of the Recommended Measure & Main Concerns to address	Location/Duration of Measures/Timing of Completion of Measures	Implementation Agent	Implementation Stage				Relevant Legislation Guidelines
						Des	C	O	Dec	

Water Quality – Post-Construction Phase (After the completion of the construction and before the operation of the beach)

6.9.2 and 11.6.2	5.2	<u>EM&A Requirements</u> <i>E. coli</i> monitoring should be conducted at the outlet of two diverted drains and at EPD’s beach water monitoring stations for the identification of pollution loading and to establish relationship between the loading and EPD’s beach monitoring programme.	To investigate the pollution loading of <i>E. coli</i> and to establish relationship with EPD’s beach monitoring data	Two diverted drains and the Bathing Beach/ Within six weeks after the completion of the construction works	ET					Post-Construction Phase (After the completion of the construction and before the operation of the beach)
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Water Quality – Operational Phase

6.6.2	-	<u>Surface Runoff from Project Site</u> A petrol interceptor should be provided in the drainage system and regularly emptied to prevent the release of oil and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain. Where appropriate, the design should follow or of similar functions as stated in the <i>ProPECC PN</i>	To prevent contamination to nearby environment	Beach Park area / During operation	Operator	✓	✓			<i>Water Pollution Control Ordinance and ProPECC PN 1/94</i>
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						Des	C	O	Dec	
		<i>1/94.</i>								
6.6.2	-	Oil leakage or spillage should be contained and cleaned up immediately. Waste oil should be collected and stored for recycling or disposal in accordance with the <i>Waste Disposal Ordinance</i> .	To prevent contamination to nearby environment	Beach Building Facility / During operation	Operator	✓		✓		<i>Waste Disposal Ordinance</i>
Waste Management – Construction Phase										
7.6	-	The Contractor should submit the plan to Project Proponent’s Engineer Representative for endorsement prior to the commencement of the construction works. The plan should incorporate site-specific factors, such as the designation of areas for the segregation and temporary storage of reusable and recyclable materials.	To ensure that adverse environmental impacts are prevented	Project Site / Contract mobilisation and during construction	Contractor	✓	✓			-
7.6	-	It will be the Contractor’s responsibility to ensure that only reputable licensed waste collectors are used and that appropriate measures to reduce adverse impacts, including windblown litter and dust from the transportation of these wastes, are employed.	To ensure that adverse environmental impacts are prevented	Project Site / Contract mobilisation and during construction	Contractor	✓	✓			-
7.6	-	The Contractor must ensure that all the necessary permits or licences required under the Waste Disposal Ordinance are obtained for the construction phase.	To ensure compliance with relevant statutory requirements	Project Site / Contract mobilisation and during construction	Contractor	✓	✓			-
7.6	-	<u>Waste Management Hierarchy</u> <ul style="list-style-type: none"> Nomination of approved personnel to be responsible for good site practices, 	To ensure that adverse environmental impacts are prevented	Project Site / Contract mobilisation and during construction	Contractor	✓	✓			<i>Waste Disposal (Charges for Disposal of</i>

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						Des	C	O	Dec	
-		<p>arrangements for collection and effective disposal to an appropriate facility of all wastes generated at the site;</p> <ul style="list-style-type: none"> • Training of site personnel in proper waste management and chemical handling procedures; • Provision of sufficient waste disposal points and regular collection for disposal; • Appropriate measures to reduce windblown litter and dust transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Centre; • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • A recording system for the amount of wastes generated/recycled and disposal sites. <p><u>Waste Reduction Measures</u></p> <ul style="list-style-type: none"> • Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse 	To reduce construction waste generation	Project Site / During construction	Contractor	✓				<p><i>Construction Waste) Regulation;</i></p> <p><i>ETWB TCW No.31/2004; and</i></p> <p><i>Appendix C of ETWB TCW No. 19/2005</i></p>

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						Des	C	O	Dec	
		or recycling of material and their proper disposal; <ul style="list-style-type: none"> Encourage collection of aluminium cans and waste paper by individual collectors during construction with separate labelled bins being provided to allow the segregation of these wastes from other general refuse generated by the workforce; Any unused chemicals and those with remaining functional capacity be recycled as far as possible; Use of reusable non-timber formwork to reduce the amount of C&D materials; Prior to disposal of construction waste, wood, steel and other metals should be separated, to the extent practical for re-use and/or recycling to reduce the quantity of waste to be disposed at landfills; Proper storage and site practices to reduce the potential for damage or contamination of construction materials; and Plan and stock construction materials carefully to reduce amount of waste generated and avoid unnecessary generation of waste. 								

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						Des	C	O	Dec	
7.6.1	-	<p><u>Dredging Materials</u></p> <p>The final disposal site for the dredged sediments should be determined by the MFC and a dumping licence should be obtained from EPD prior to the commencement of the dredging works. Uncontaminated sediments should be disposed of at open sea disposal sites designated by the MFC. For contaminated sediments requiring Type 2 confined marine disposal, relevant contract documents should specify the allocation conditions of the MFC and EPD.</p>	To ensure adverse environmental impacts are prevented	Dredging area / During construction	Contractor		✓			<i>Dumping at Sea Ordinance</i>
7.6.2	-	<p><u>Excavated Materials and C&D Waste</u></p> <p><i>Management of Waste Disposal</i></p> <p>The contractor should open a billing account with EPD in accordance with the Waste Disposal (Charges for Disposal of Construction Waste) Regulation for the payment of disposal charges. Every waste load transferred to Government waste disposal facilities such as public fill, sorting facilities, or landfills should require a valid “chit” which contains the information of the account holder to facilitate waste transaction recording and billing to the waste producer. A trip-ticket system should be established in accordance with TCW No. 6/2010 to monitor the reuse of surplus excavated materials off-site and disposal of construction waste and general refuse at</p>	To properly handle the excavated materials and C&D waste and thus avoid any adverse impacts	Project Site / During construction	Contractor		✓			<i>Waste Disposal (Charges for Disposal of Construction Waste) Regulation</i>

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						Des	C	O	Dec	
		transfer stations/landfills, and to control fly-tipping. The billing “chit” and trip-ticket system should be included as one of the contractual requirements and implemented by the contractor. Regular audits of the waste management measures implemented on-site as described in the Waste Management Plan should be conducted.								
		A recording system (similar to summary table as shown in Annex 4 and Annex 5 of Appendix C of ETWB TWC No. 19/2005) for the amount of waste generated, recycled and disposed of (including the disposal sites) will be established during the construction phase.								
7.6.2	-	<p><i>Reduction of C&D Materials Generation</i></p> <p>Public fill and construction waste should be segregated and stored in different containers or skips to facilitate reuse or recycling of the public fill and proper disposal of the construction waste. Specific areas of the work site should be designated for such segregation and storage if immediate use is not practicable.</p> <p>To reduce the potential dust and water quality impacts of site formation works, C&D materials should be wetted as quickly as possible to the extent practicable after excavation/filling.</p>	To reduce the generation of C&D waste	Project Site / During construction	Contractor		✓			-

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						Des	C	O	Dec	
7.6.3	-	<p><u>Chemical Waste</u></p> <p>The Contractor should register as a chemical waste producer with the EPD. Chemical waste, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes. Containers used for the storage of chemical wastes should:</p> <ul style="list-style-type: none"> • Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; • Have a capacity of less than 450 L unless the specifications have been approved by the EPD; and • Display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Regulations. <p>The storage area for chemical wastes will:</p> <ul style="list-style-type: none"> • Be clearly labelled and used solely for the storage of chemical waste; • Be enclosed on at least 3 sides; 	To ensure proper handling of chemical waste	Project Site / During construction	Contractor				✓	<i>Code of Practice on the Packaging, Handling and Storage of Chemical Wastes</i>

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						Des	C	O	Dec	

- Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest;
- Have adequate ventilation;
- Be covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and
- Be arranged so that incompatible materials are appropriately separated.

Chemical waste should be collected by a licensed chemical waste collector to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility.

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						Des	C	O	Dec	
7.6.4	-	<p><u>Sewage</u></p> <p>An adequate number of portable toilets should be provided for the on-site construction workforce during construction phase. All portable toilets should be maintained in a state that will not deter the users from using them. Night soil should be regularly collected by a licensed collector for disposal. The sewage generated from the visitors during operation of the Proposed Beach Development should be discharged to the adjacent foul sewer conveying to Tai Po Sewage Treatment Works for treatment.</p>	To ensure proper handling of sewage	Project Site / During construction	Contractor	✓				-
7.6.5	-	<p><u>General Refuse</u></p> <p>General refuse should be stored in enclosed bins or compaction units separately from construction and chemical wastes. A reputable waste collector should be employed to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to reduce odour, pest and litter impacts. The burning of refuse on construction sites is prohibited by law.</p> <p>Recycling bins should be provided at strategic locations to facilitate recovery of aluminium cans and waste paper from the Project Site. Materials recovered should be sold for recycling.</p>	To ensure proper handling of general refuse	Project Site / During construction	Contractor	✓				-

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						Des	C	O	Dec	
7.6.6	-	<p><u>Staff Training</u></p> <p>Training should be provided to workers on the concept of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycling at the beginning of the construction works.</p>	To ensure that adverse environmental impacts are prevented	Project Site / Contract mobilisation and during construction	Contractor	✓	✓			-
7.7	6.1	<p><u>EM&A Requirements</u></p> <p>Joint site audits by the Environmental Team and the Contractor should be undertaken on a weekly basis. Particular attention should be given to the Contractor’s provision of sufficient spaces, adequacy of resources and facilities for on-site sorting and temporary storage of C&D materials. The C&D materials to be disposed of from the Project Site should be visually inspected. The public fill for delivery to the off-site stockpiling area should contain no observable non-inert materials (e.g., general refuse, timber, etc).</p> <p>The waste to be disposed of at refuse transfer stations or landfills should as far as possible contains no observable inert or reusable/recyclable C&D materials (e.g., soil, broken rock, metal, and paper/cardboard packaging, etc). Any irregularities observed during the weekly site audits should be raised promptly to the Contractor for rectification.</p>	To ensure that adverse environmental impacts are prevented	Project Site / During construction	ET and Contractor		✓			-

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						Des	C	O	Dec	
<i>Ecology – Construction Phase</i>										
8.10.2	7.1	<p><u>Measures for Common Rat Snake</u></p> <p>To undertake a search of the Common Rat Snake within the land based Project Site just before the commencement of the construction works. Due to the small size of the Project Site and given that there are no optimal habitats for Common Rat Snake, one day-time search is considered sufficient. The surveyor(s) should actively search the areas within the Project Site and pay special attention to the leaf litters and rocks. All recorded Common Rat Snake should be caught by hand and translocated to the shrubland at the north of the Study Area, immediately after the search. The Common Rat Snake search and translocation works should be undertaken by a qualified ecologist with relevant experience in faunal translocation works.</p>	To ensure that adverse impacts arising from the Project to Common Rat Snake are prevented	Project Site (land based) / prior to commencement of construction works	ET / Qualified Ecologist	✓				-
-	7.2	<p><u>Measures for marine ecology</u></p> <p>(1) To translocate target marine fauna, including fishes, starfish, sea urchins and sea cucumbers, from the intertidal area of the Site at Lung Mei to the intertidal area at the reception site of Ting Kok East before commencement of sand filling works or any other works that may cause disturbances to the</p>	To ensure that adverse impacts arising from the Project to marine ecology	Project Site (marine based) / prior to commencement of marine works	ET / Qualified Ecologist	✓				

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						Des	C	O	Dec	
		<p>existing marine ecology. The translocation works shall cover capturing, handling, holding transporting and releasing of the captured target marine fauna.</p> <p>(2) Translocation of seahorses, including identifying, capturing, handling, protecting, transporting and placing the target seahorse species from Site at Lung Mei to the reception site of Ting Kok East, as well as pre- and post-translocation monitoring and post-construction monitoring shall be conducted. Seahorse translocation shall be undertaken before the commencement of marine construction works. The identifying, capturing, handling, protecting, transporting and placing of seahorses shall be led and supervised by the Fish Specialist.</p>								
8.10.2	-	<p><u>Dredging and Sand Filling Operations</u></p> <p>It is predicted that the sediment plume and the sediment deposition will not be large in extent and no unacceptable water impacts including DO depletion, release of contaminants and nutrients are expected. Although no unacceptable water quality impacts would result, the following good construction site practice and proactive precautionary measures are recommended to</p>	To minimise ecological impacts arising from dredging and sand filling works	Project Site / During dredging and sand filling works	Contractor		✓			-

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						Des	C	O	Dec	
		<p>ensure dredging and sandfilling operations would be undertaken in such a manner as to avoid any uncontrolled or unexpected incidents during the marine works:</p> <ul style="list-style-type: none"> A movable cage type / metal frame type silt curtain should be deployed around the dredging area next to the grab dredger prior to commencement of dredging works; Standing type silt curtains should be deployed around the proposed sandfilling extent prior to commencement of sandfilling works; and <p>Proper equipment, dredging rate, filling rate and good construction practices should be implemented, details refer to <i>Section 6.6.1</i>.</p>								
8.10.2	-	<p><u>Measures for Controlling Construction Runoff</u></p> <ul style="list-style-type: none"> Storm water run-off from the construction site should be directed into existing drainage channel via adequately designed sand/silt removal facilities such as sand/silt traps and oil interceptors. Channels, earth bunds or sand bag 	To minimise ecological impacts of construction runoff	Project Site / During dredging and filling works	Contractor		✓		-	

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						Des	C	O	Dec	
		barriers should be provided on site to properly direct storm water to such silt removal facilities.								
8.10.2	-	<u>Planting along the Western Drainage Diversion</u> <ul style="list-style-type: none"> Provide tree/ shrub/ climber planting along the gabion wall of the new drainage channel. Regular monitoring and removal of the weed plant <i>Mikania micrantha</i> during the establishment and maintenance period. 	To provide an ecological habitat	Along gabion wall of the new western drainage channel/ After completion of the gabion	Contractor		✓	✓		-
8.10.2	-	<u>Good Construction Practices</u> <ul style="list-style-type: none"> Erect fences along the boundary of the Extension Site before the commencement of works to prevent vehicle movements, and encroachment of personnel, onto adjacent areas; and Regularly check the work site boundaries to ensure that they are not breached and that damage does not occur to surrounding areas. 	To avoid any adverse ecological impacts	Project Site / During construction works	Contractor		✓			-
Fisheries – Construction Phase										
9.10.1	-	<u>EM&A Requirements</u> EM&A is not required during the	To ensure that no water quality deterioration in the	Details refer to Section 12.6 of the EM&A	ET and Contractor			✓		<i>Environmental Impact</i>

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						Des	C	O	Dec	
		construction phase of the Project. However, water quality monitoring will be conducted at the Yim Tin Tsai Fish Culture Zone. Details should be referred to the Water Quality Section.	Fish Culture Zone as a result of the dredging and sandfilling works	Manual.						<i>Assessment Ordinance, Annex 21 of the EIAO-TM</i>
<i>Landscape and Visual Impact – Construction Phase</i>										
10.5.1	-	<u>Landscape Mitigation</u> A Landscape Plan will be submitted before the commencement of Works.	To provide landscaping work.	Before commencement of construction phase	ET and Contractor	✓				-
10.6.10	-	<i>Cultivation of areas impacted during construction.</i> Areas impacted during the construction phase that are not required during the operation phase, are to be cultivated to a depth of 300mm in accordance with accepted Hong Kong practice and guidelines. The cultivation shall involve ripping of compacted soil by mechanical means and the addition gypsum and/or organic fertiliser if required.	To improve the soil allowing plants to thrive	Project Site / During construction	Contractor		✓			-
10.6.10	-	<i>Car Park Tree Planting.</i> Advanced trees are to be planted in the car park.	To provide shade to the carpark areas and to reduce the mass of the paved areas	Project Site / During construction	Contractor		✓			-
10.6.10	-	<i>Tree and shrub planting.</i> All planting of trees and shrubs is to be carried out in accordance with the relevant best practice guidelines. Plant densities are to be provided in future detailed design documents and are to be selected so as to achieve a finished landscape that matches	To improve the appearance of the development	Project Site / During construction	Contractor			✓		-

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						Des	C	O	Dec	
		the surrounding, undisturbed, equivalent landscape types. Regular monitoring and removal of the weed plant <i>Mikania micrantha</i> during the establishment and maintenance period.								
10.6.10	-	<i>Roof Terrace Planting.</i> Trees, shrubs and climbers shall be established in planters on the roof terraces of the new structures where possible.	To improve the appearance of the development by softening the building element	Project Site / During construction	Contractor		✓			-
10.6.10	-	<i>Natural Rock Groynes</i> New rock groynes are needed to contain the sand of the new beach. Natural stones will be used for construction of the Groynes.	To improve the appearance of the development to make the man-made feature be more compatible with the surroundings	Project Site / During construction	Contractor		✓			-
10.6.10	-	<i>Inter-Tidal Re-generation.</i> It is likely that a build up of sediment and sand will occur at the outer edges of the rock groyne. This is a natural process and the development proponent has no control over the implementation of this mitigation measure.	To improve the appearance of the development	Adjacent areas	Nil			✓		-
10.6.10	-	<i>Mangrove Re-generation.</i> Mangroves of similar species to existing to be manually established by planting of droppings.	To improve the ecological value of the project	Project Site / During post-construction	Contractor		✓			-
10.6.10	-	<i>Buffer Planting.</i> Trees and shrubs are to be planted along Ting Kok road to screen the development from the nearby Village/Developed Areas.	To improve the appearance of the development	Project Site / During post-construction	Contractor		✓			-

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						Des	C	O	Dec	
10.6.10	-	<i>Early Planting Works</i> Where technically feasible, new plantings are to be installed during the construction works to reduce landscape impacts.	To improve the appearance of the development	Project Site / During construction	Contractor		✓			-
10.6.10	-	<i>Tree Protection/Transplantation.</i> Where technically feasible, existing trees in the Trees/Backshore Vegetation LR are to be retained. Those trees that cannot be retained that are of value are to be transplanted.	To improve the appearance of the development	Project Site / Before commencement of construction	Contractor		✓			-
10.7.9	-	<u>Visual Mitigation</u> <i>Design of Structures.</i> The structure shown in the photomontages are to illustrate the mass of the structures only. During the design phase of the development, features such as the location of doors, windows, eaves etc. will be detailed. All of these elements will greatly improve the appearance of the structures. Where possible, built structures will utilise appropriate designs to complement the surrounding landscape. Materials and finishes will also be considered during detailed design.	To reduce visual impacts and improve the appearance of the development	Project Site / During construction	Architect		✓			-
10.7.9	-	<i>Colour Scheme.</i> Colours for the structures can be used to complement the surrounding area. Lighter colours such as shades of light grey, off-white and light brown may be utilised where technically feasible to reduce the visibility of the structures.	To reduce visual impacts and improve the appearance of the development	Project Site / During construction	Architect		✓			-
10.7.9	-	<i>Plantings.</i> In addition to the landscape	To help integrate the new	Project Site / During	Contractor		✓			-

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						Des	C	O	Dec	
		mitigation plantings proposed in Section 10.5.9 of the EIA report, appropriate new plantings will be installed as appropriate to help integrate the new structures into the surrounding landscape.	structures into the surrounding landscape	post-construction						
10.7.9	-	<i>Colour of Site Hoardings.</i> In order to mitigate the visual impact of these temporary hoardings, it is recommended that the hoardings be erected at a uniform height, with a uniform colour that complements the existing surrounding landscape.	To mitigate the visual impact of temporary hoardings	Project Site / During construction	Contractor		✓			-
-	9.2	<u>EM&A Requirements</u> A specialist Landscape Sub-Contractor should be employed for the implementation of landscape construction works and subsequent maintenance operations during a 12-month establishment period. A Registered Landscape Architect should be employed to supervise the specialist Landscape Sub-contractor for the implementation of landscape works, both hard and soft, involved. Measures undertaken by both the Contractor(s) and the specialist Landscape Sub-Contractor during the construction phase and first year post-construction will be audited by the Registered Landscape Architect of the ET. Site inspections should be undertaken at	To check the implementation and maintenance of landscape mitigation measures and ensure that they are fully realised and that potential conflicts between the proposed landscape measures and any other project works and operational requirements are resolved at the earliest practical date and without compromise to the intention of the mitigation measures	Project Site / During construction and post-construction phase	Specialist Landscape Sub-contractor, Registered Landscape Architect and ET		✓			-

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						Des	C	O	Dec	
		least once every two weeks throughout the landscaping plants establishment period when planting works are being undertaken.								
		<p>A tree survey should be prepared, for DLO submission, and for the purpose of existing trees protection. Removal of existing trees to be minimized. The Contractor should consider to employ a certified arborist when sizable and valuable existing tree(s) protection of transplant is required.</p> <p>Post-construction phase auditing will be restricted to the 12-month establishment works of the landscaping proposals.</p> <p>Advance planting- monitoring of implementation and maintenance of planting, and against potential incursion, physical damage, fire, pollution, surface erosion, etc.</p> <p>Protection of trees to be retained-identification and demarcation of trees / vegetation to be retained, erection of physical protection (e.g. fencing), monitoring against potential incursion, physical damage, fire, pollution, surface erosion, etc.</p> <p>Clearance of existing vegetation-identification and demarcation of trees / vegetation to be cleared, checking of</p>								

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						Des	C	O	Dec	
		extent of works to reduce damage, monitoring of adjacent areas against potential incursion, physical damage, fire, pollution, surface erosion, etc.								
		Transplanting of trees-identification and demarcation of trees / vegetation to be transplanted, monitoring of extent of pruning / lifting works to reduce damage, timing of operations, implementation of the stages of preparatory and translocation works, and maintenance of transplanted vegetation, etc.								
		Plant supply-monitoring of operations relating to the supply of specialist plant material (including the collecting, germination and growth of plants from seed) to ensure that plants will be available in time to be used within the construction works.								
		Soiling, planting, etc-monitoring of implementation and maintenance of soiling and planting works and against potential incursion, physical damage, fire, pollution, surface erosion, etc.								
		Architectural design and treatment of all structures (where practicable), retaining walls, elevated road structures and other engineering works-implementation and maintenance of mitigation measures, to ensure conformity with agreed designs.								
		Erection of Site Hoardings/Fences-								

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						Des	C	O	Dec	
		Erection of site hoardings/fences during the construction phase to reduce visual impacts.								
		Establishment Works- monitoring of implementation of maintenance operations during Establishment Period.								

Remark: Des – Design; C – Construction; O – Operation; Dec – Decommissioning