



JOB No.: TCS01062/19

**EPD CONTRACT NO. EP/SP/86/15
ORGANIC WASTE TREATMENT FACILITIES PHASE 2**

**MONTHLY ENVIRONMENTAL MONITORING AND AUDIT
REPORT (MAY 2023)**

**PREPARED FOR
AJA JOINT VENTURE**

Date	Reference No.	Prepared By	Certified By
7 June 2023	TCS01062/19/600/R0316v1	 Martin Li (Environmental Consultant)	 Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	6 June 2023	First Submission
2	7 June 2023	Amended against IEC's comments

Your ref TCS1062/19/300/L0317
Our ref 271491/02-09/RC/VH/NL-5335
File ref 02-09

ARUP

Level 5 Festival Walk
80 Tat Chee Avenue
Kowloon Tong
Kowloon
Hong Kong
t +852 2528 3031
d +852 2268 3437
f +852 2268 3380
ricky-kh.chui@arup.com
www.arup.com

BY EMAIL (chriskwleung@cohl.com)

AJA Joint Venture
5/F, Tower A, Manulife Financial Centre
223-231 Wai Yip Street
Kwun Tong, Kowloon
Hong Kong

Attn: Mr. Chris Leung

8 June 2023

Dear Sir

**Contract No. EP/SP/86/15
Organic Waste Treatment Facilities Phase 2
Monthly Environmental Monitoring & Audit Report (May 2023)**

Referring to your letter referenced above dated 6 June 2023, pursuant to Permit Condition 3.4 of the Further Environmental Permit No.FEP-01/460/2013/A, we hereby verify that the report ref. no. TCS01062/19/600/R0316v1 dated 7 June 2023 complied in general with the requirements as set out in the EM&A Manual.

Should you have any queries, please contact the undersigned at 2268 3437.

Yours faithfully



Ricky Chui
Independent Environmental Checker

cc EPD – Ms. Winnie Chu, Mr. Sunny Chiu, Mr. Jason Tsang, Mr. Julian Lam
Mr. W.W. Lau, Mr. Peter Wong, Mr. Gilbert Wong, Mr. David Ng
AECOM – Mr. Desmond Ng, Mr. Ben Tsang, Mr. Philip Cheung
Mr. K. C. Chu, Mr. Ivan Yung, Mr. YW Mok, Ms. Karie Ng
Mr. W.W. Tong, Ms. Rachel Zu
AJA JV – Ms. Tso So Fong, Mr. Tse Man Kit, Mr. Salinda Palipana
Ms. Beth Biddle, Mr. Gabriel Wong
AUES – Mr. T.W. Tam, Mr. Martin Li

EXECUTIVE SUMMARY

- ES01 Environmental Protection Department (hereinafter referred as “EPD”) is the Project Proponent for the Project “*Organic Waste Treatment Facilities Phase 2*” (hereinafter referred as “the Project”). The Project is a Designated Project to be implemented under Environmental Permit No. EP-460/2013 (hereinafter referred as “the EP”). In accordance with the Works Contract requirements, the Contractor shall take over the responsibility of the EP. Based on the requirement, Further Environmental Permit FEP-01/460/2013/A (hereinafter referred as “the FEP”) was applied by AJA Joint Venture (hereinafter referred as “AJAJV”).
- ES02 Action-United Environmental Services & Consulting (hereinafter referred as “AUES”) was employed as Environmental Team (hereinafter referred as “ET”) to implement monitoring programmes and as well as the associated duties.
- ES03 This is the monthly EM&A report presenting the environmental monitoring results and inspection findings for the reporting period from **1 to 31 May 2023** (hereinafter ‘the Reporting Period’).

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

- ES04 Environmental monitoring activities under the EM&A program in this Reporting Period are summarized in the following table.

Table ES-1 Summary of Environmental Monitoring Activities Undertaken in the Reporting Period

Issues	Environmental Monitoring Parameters / Inspection	Sessions
Construction Noise	Leq (30min) Daytime	20
	Leq (5min) restricted hours 19:00-07:00 including public holidays and Sundays	36
Inspection / Audit	ET Regular Environmental Site Inspection	5

BREACH OF ACTION AND LIMIT (A/L) LEVELS

- ES05 No construction noise monitoring exceedance was recorded in this Reporting Period. The statistics of environmental exceedance and investigation of exceedance are summarized in the following table.

Table ES-2 Summary of Environmental Monitoring Parameter Exceedance in the Reporting Period

Environmental Issues	Monitoring Parameters	Action Level	Limit Level	Event & Action	
				Investigation Results	Corrective Actions
Construction Noise	Leq _{30min} Daytime	0	0	NA	NA
	Leq _{5min} Restricted hour	0	0	NA	NA

SITE INSPECTION

- ES06 In the Reporting Period, weekly joint site inspections to evaluate the site environmental performance had been carried out by the representative of the Consultants, Independent Environmental Checker (IEC), ET and the Contractor on **3, 10, 17, 25 and 31 May 2023**. No non-compliance was recorded during the site inspections.

ENVIRONMENTAL COMPLAINT

ES07 No environmental complaint was recorded in this Reporting Period for the Project. The statistics of environmental complaint are summarized in the following table.

Table ES-3 Summary of Environmental Complaint Records in the Reporting Period

Reporting Period	Environmental Complaint Statistics			Related with the Works Contract
	Frequency	Cumulative	Complaint Nature	
1 – 31 May 2023	0	7	NA	NA

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES08 No environmental summons or prosecutions was received in this Reporting Period for the Project. The statistics of environmental summons or prosecutions are summarized in the following tables.

Table ES-4 Summary of Environmental Summons Records in the Reporting Period

Reporting Period	Environmental Summons Statistics			Related with the Works Contract
	Frequency	Cumulative	Complaint Nature	
1 – 31 May 2023	0	0	NA	NA

Table ES-5 Summary of Environmental Prosecutions Records in the Reporting Period

Reporting Period	Environmental Prosecution Statistics			Related with the Works Contract
	Frequency	Cumulative	Complaint Nature	
1 – 31 May 2023	0	0	NA	NA

REPORTING CHANGE

ES09 No reporting change was made in this Reporting Period.

FUTURE KEY ISSUES

ES10 Construction noise would be a key environmental issue during construction work of the Project. Noise mitigation measures such as using quiet plants and noise barriers should be implemented in accordance with the EM&A requirement.

ES11 In addition, all effluent discharge from the construction site shall fulfill the discharge licence stipulation.

Table of Contents

1. INTRODUCTION	1
1.1 PROJECT BACKGROUND	1
1.2 REPORT STRUCTURE	1
2. PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS	2
2.1 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS	2
2.2 CONSTRUCTION PROGRESS	3
2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS	4
3. SUMMARY OF IMPACT MONITORING REQUIREMENTS	5
3.1 MONITORING PARAMETERS	5
3.2 MONITORING LOCATIONS	5
3.3 MONITORING FREQUENCY AND PERIOD	5
3.4 MONITORING EQUIPMENT	5
3.4.2 EQUIPMENT USED FOR CONSTRUCTION NOISE MONITORING IS LISTED IN <i>TABLE 3-3</i> .	6
3.5 MONITORING METHODOLOGY	6
3.6 ACTION/LIMIT (A/L) LEVELS	6
3.7 DATA MANAGEMENT AND DATA QA/QC CONTROL	7
4. CONSTRUCTION NOISE MONITORING	8
4.1 GENERAL	8
4.2 RESULTS OF NOISE MONITORING	8
5. WASTE MANAGEMENT	11
5.1 GENERAL WASTE MANAGEMENT	11
5.2 RECORDS OF WASTE QUANTITIES	11
6. SITE INSPECTION	12
6.1 REQUIREMENTS	12
6.2 FINDINGS / DEFICIENCIES DURING THE REPORTING PERIOD	12
7. ENVIRONMENTAL COMPLAINT, NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS	13
7.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION	13
8. ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE	14
8.1 GENERAL REQUIREMENTS	14
8.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH	14
9. CONCLUSIONS AND RECOMMENDATIONS	15
9.1 CONCLUSIONS	15
9.2 RECOMMENDATIONS	15

LIST OF TABLES

TABLE 2-1	STATUS OF ENVIRONMENTAL LICENSES AND PERMITS OF THE PROJECT
TABLE 3-1	SUMMARY OF EM&A REQUIREMENTS
TABLE 3-2	IMPACT MONITORING STATIONS - CONSTRUCTION NOISE
TABLE 3-3	CONSTRUCTION NOISE MONITORING EQUIPMENT
TABLE 3-4	ACTION AND LIMIT LEVELS FOR CONSTRUCTION NOISE
TABLE 4-1	DAYTIME CONSTRUCTION NOISE IMPACT MONITORING RESULTS AT N1
TABLE 4-2	DAYTIME CONSTRUCTION NOISE IMPACT MONITORING RESULTS AT N2A
TABLE 4-3	DAYTIME CONSTRUCTION NOISE IMPACT MONITORING RESULTS AT N3A
TABLE 4-4	DAYTIME CONSTRUCTION NOISE IMPACT MONITORING RESULTS AT N4
TABLE 4-5	ADDITIONAL NOISE IMPACT MONITORING RESULTS DURING RESTRICTED HOURS AT N1
TABLE 4-6	ADDITIONAL NOISE IMPACT MONITORING RESULTS DURING RESTRICTED HOURS AT N2A
TABLE 4-7	ADDITIONAL NOISE IMPACT MONITORING RESULTS DURING RESTRICTED HOURS AT N3A
TABLE 4-8	ADDITIONAL NOISE IMPACT MONITORING RESULTS DURING RESTRICTED HOURS AT N4
TABLE 5-1	SUMMARY OF QUANTITIES OF INERT C&D MATERIALS
TABLE 5-2	SUMMARY OF QUANTITIES OF C&D WASTES
TABLE 6-1	SITE OBSERVATIONS DURING THE WEEKLY INSPECTION
TABLE 7-1	STATISTICAL SUMMARY OF ENVIRONMENTAL COMPLAINTS
TABLE 7-2	STATISTICAL SUMMARY OF NOTIFICATION OF SUMMONS
TABLE 7-3	STATISTICAL SUMMARY OF SUCCESSFUL PROSECUTION
TABLE 8-1	ENVIRONMENTAL MITIGATION MEASURES

LIST OF APPENDICES

APPENDIX A	LAYOUT PLAN OF THE PROJECT
APPENDIX B	ORGANIZATION CHART
APPENDIX C	MONITORING LOCATIONS FOR IMPACT MONITORING
APPENDIX D	3-MONTH ROLLING CONSTRUCTION PROGRAMME
APPENDIX E	EVENT AND ACTION PLAN
APPENDIX F	IMPACT MONITORING SCHEDULE OF THE REPORTING PERIOD AND COMING MONTH
APPENDIX G	CALIBRATION CERTIFICATES OF EQUIPMENT
APPENDIX H	DATABASE OF MONITORING RESULTS
APPENDIX I	GRAPHICAL PLOTS OF MONITORING RESULTS
APPENDIX J	WASTE FLOW TABLE
APPENDIX K	ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

1. INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 Environmental Protection Department (hereinafter referred as “EPD”) is the Project Proponent for the Project “*Organic Waste Treatment Facilities Phase 2*” (hereinafter referred as “the Project”). The Project is a Designated Project to be implemented under Environmental Permit No. FEP-460/2013 (hereinafter referred as “the EP”). The major construction work of the Project included:

- (i) Demolition and removal of the existing above ground structures of the Sha Ling Livestock Waste Composting Plant (SLCP);
- (ii) Construction of superstructure for an administration building and enclosed waste reception area;
- (iii) Installation of treatment facilities including waste pre-treatment equipment, digesters, biogas holding tanks, granulator/granulation building, wastewater treatment, air treatment systems; and
- (iv) Facilities for biogas processing, utilization and transmission;

1.1.2 AJA Joint Venture (hereinafter referred as “AJAJV”) has been awarded the *EPD Contract No. EP/SP/86/15 “Organic Waste Treatment Facilities Phase 2”*. In accordance with the Works Contract requirements, AJAJV shall take over the responsibility of the EP. Based on the requirement, Further Environmental Permit application was submitted by AJAJV to EPD on 10 September 2019 and granted on 2 October 2019. A variation of Further Environmental Permit was granted on 14 September 2020. The Further Environmental Permit is named as FEP-01/460/2013/A (hereinafter referred as “the FEP”).

1.1.3 According to the approved Environmental Monitoring and Audit Manual (hereinafter referred as “the EM&A Manual”), AJAJV employed Action-United Environmental Services & Consulting (hereinafter referred as “AUES”) as Environmental Team (hereinafter referred as “ET”) to implement monitoring programme and as well as the associated duties.

1.1.4 According to the EM&A Manual, construction noise was identified as the only key environmental issue during the construction phase of the Project and it is required to carry out construction noise monitoring throughout the construction phase. Furthermore, baseline noise monitoring as part of the EM&A programmes shall be conducted prior to the commencement of the construction works under the Project. Thus, baseline noise monitoring was conducted by ET from **25 September 2019** to **8 October 2019**. The baseline monitoring report compiled by the ET was verified by Independent Environmental Checker (hereinafter the “IEC”) and was submitted to EPD on 19th November 2019 for endorsement.

1.1.5 The Project works was commenced on **3rd December 2019**. This is the **41st** EM&A monthly report presenting the construction noise monitoring results and site inspection findings from **1 to 31 May 2023** (hereinafter the “Reporting Period”).

1.2 REPORT STRUCTURE

1.2.1 The Monthly Environmental Monitoring and Audit (EM&A) Report is structured into the following sections:-

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>Construction Noise Monitoring</i>
Section 5	<i>Waste Management</i>
Section 6	<i>Site Inspections</i>
Section 7	<i>Environmental Complaints and Non-Compliance</i>
Section 8	<i>Implementation Status of Mitigation Measures</i>
Section 9	<i>Conclusions and Recommendations</i>

2. PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

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 include:

- to monitor the Contractor's compliance with Contract Specifications, including the effective implementation and operation of the environmental mitigation measures;
- to employ an Independent Environmental Checker (IEC) to audit the results of the EM&A works carried out by the Environmental Team (ET);
- to monitor Contractors', ET's and IEC's compliance with the requirements in the Environmental Permit (EP) and EM&A Manual;
- to facilitate ET's implementation of the EM&A programme;
- participate in joint site inspection by the ET and IEC;
- to oversee the implementation of the agreed Event / Action Plan in the event of any exceedance; and,
- to adhere to the procedures for carrying out complaint investigation.

The Contractor

2.1.3 The Contractor should report to the ER. The duties and responsibilities of the Contractor include:

- to comply with the relevant contract conditions and specifications on environmental protection;
- to employ an ET to undertake monitoring, laboratory analysis and reporting of EM&A;
- to facilitate ET's monitoring and site inspection activities;
- to participate in the site inspections undertaken by the ET and IEC, and undertake any corrective actions;
- to provide information / advice to the ET regarding works programme and activities which may contribute to the generation of adverse environmental impacts;
- to submit proposals on mitigation measures in case of exceedance of Action and Limit levels in accordance with the Event / Action Plans;
- to implement measures to reduce impact where Action and Limit levels are exceeded; and,
- to 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. ET Leader should have relevant professional qualifications in environmental control and possess at least 7 years of experience in EM&A. Suitably qualified staff should be included in the ET, and resources for the implementation of the EM&A programme should be allocated in the time under the Contract, to enable fulfilment of the Project's EM&A requirements as specified in the EM&A Manual during construction of the Project. The ET should report to Project Proponent and the duties should include:

- to monitor and audit various environmental parameters as required in this EM&A Manual;
- to analyse the environmental monitoring and audit data, review the success of EM&A programme and the adequacy of mitigation measures implemented, confirm the validity of the EIA predictions and identify any adverse environmental impacts arising;
- to monitor compliance with conditions in the EP, environmental protection, pollution prevention and control regulations and contract specifications;
- to audit environmental conditions on site;
- to report on the environmental monitoring and audit results to EPD, the ER, the IEC and Contractor or their delegated representatives;

- to 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;
- to liaise with the IEC on all environmental performance matters, and ensure timely submission of all relevant EM&A pro forma for IEC's approval;
- to provide advice to the Contractor on environmental improvement, awareness and enhancement matters, etc on site;
- to adhere to the procedures for carrying out complaint investigation;
- to prepare reports on the environmental monitoring data and the site environmental conditions;
- to submit the EM&A report to Director of Environmental Protection (DEP) timely;
- to review proposals of mitigation measures from the Contractor in case of exceedance of Action and Limit levels, in accordance with Event and Action Plan; and,
- to carry out site inspection to investigate and audit the Contractor's site practice, equipment and work methodologies with respect to pollution control and mitigation measures.

Independent Environmental Checker (IEC)

2.1.5 The IEC is empowered to audit the environmental performance of construction, but is independent from the management of construction works. As such, the IEC should not be in any way an associated body of the Contractor or the ET for the Project. The IEC should be a person who has relevant professional qualifications in environmental control and at least 7 years' experience in EM&A and environmental management. The duties and responsibilities of the IEC are:

- to provide proactive advice to the ER on EM&A matters related to the project;
- to review and verify the monitoring data and all submissions in connection with the EP and EM&A Manual submitted by the ET;
- to arrange and conduct regular, at least monthly site inspections of the works during the construction phase, and to carry out ad hoc inspections if significant environmental problems are identified;
- to check compliance with the agreed Event / Action Plan in the event of any exceedance;
- to check compliance with the procedures for carrying out complaint investigation;
- to check the effectiveness of corrective measures;
- to feedback audit results to the ET by signing off relevant EM&A pro forma;
- to check that mitigation measures are effectively implemented;
- to report the works conducted, and the findings, recommendations and improvements of the site inspections, after reviewing ET's and Contractor's works, to the ER on a monthly basis;
- to verify the investigation result of the environmental complaint cases and the effectiveness of corrective measures;
- to verify EM&A report that has been certified by ET leader; and,
- to audit EIA recommendations and requirements against the status of implementation of environmental mitigation measures on site.

2.2 CONSTRUCTION PROGRESS

2.2.1 3-month rolling construction program of the Project is enclosed in [Appendix D](#); and the major construction activities undertaken in the Reporting Period is presented as below:

- Granulation Building – Bund walls and partition walls construction at DG8, DG1, DG2 & DG3.
- Reception Building – Skylight installation completed
- AD Tanks – AD1 formwork erection for tank bottom mass concrete fill
- Pump House – Pre-E&M installation ABWF work to M/F, 1/F & R/F completed
- Footbridge – Adjustment and grouting of bearings to fix on piers completed; FPR painting to half of steel bridge (i.e. from Administration Building up to pier P3) completed.

2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.3.1 Summary of the relevant permits, licenses, and/or notifications on environmental protection for the Project of contract 1 are presented in *Tables 2-1*.

Table 2-1 Status of Environmental Licenses and Permits of the Project

Item	Description	License/Permit Status				Status
		Permit no./ account no./ Ref. no.	Valid Period			
			From	To		
1	Notification pursuant to Air pollution Control (Construction Dust) Regulation	Application No. 448863	9 Sep 2019	NA	Valid	
2	Chemical Waste Producer Registration	Ref. No. 5211-641-A2957-01	9 Oct 2019	NA	Valid	
3	Water Pollution Control Ordinance - Discharge License	Application No. 448913	--	--	Application made on 10 Sep 2019	
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7035307	2 Oct 2019	NA	Valid	
5	Further Environmental Permit	FEP-01/460/2013/A	14 Sep 2020	NA	Valid	
6	Construction Noise Permit	GW-RN0323-23	6 Apr 2023	5 Jul 2023	Valid	
7	Waste Water Discharge License	WT00035196-2019	20 Mar 2020	31 Mar 2025	Valid	

3. SUMMARY OF IMPACT MONITORING REQUIREMENTS

3.1 MONITORING PARAMETERS

- 3.1.1 According to Environmental Monitoring and Audit requirements set out in the Approved EM&A manual, construction noise was identified as the only key environmental issues during the construction phase of the Project.
- 3.1.2 The construction noise monitoring requirement stated in the approved EM&A Manual is summarized in *Table 3-1*.

Table 3-1 Summary of EM&A Requirements

Environmental Issue	Parameters
Noise	<ul style="list-style-type: none"> Leq(30min) in normal working days (Monday to Saturday) 07:00-19:00 except public holiday Supplementary information for data auditing, statistical results such as L₁₀ and L₉₀ shall also be obtained for reference. Leq(5min) if construction works are extended to restricted hours 19:00-07:00 including public holidays and Sundays

3.2 MONITORING LOCATIONS

- 3.2.1 According to the EM&A Manual Section 4.2.3, four (4) designated noise sensitive receivers (NSR) were recommended as construction noise monitoring stations. Since two of the designated monitoring locations N2 and N3 were found not accessible, alternative monitoring locations N2a and N3a were therefore proposed for the noise monitoring and were approved by EPD on 1 June 2021. Details of the locations for construction noise monitoring in the Reporting Period is listed in *Table 3-2* and showed in *Appendix C*.

Table 3-2 Impact Monitoring Stations – Construction Noise

ID	Location
N1	Village House No. 308, Sha Ling
N2a	Village House No. 318, Sha Ling
N3a	Village House No. 261, Sha Ling
N4	Village House in Sha Ling

3.3 MONITORING FREQUENCY AND PERIOD

- 3.3.1 Noise monitoring shall be conducted at the all available designated monitoring stations or alternative locations. The monitoring frequency shall depend on scale of the construction activities. According to EM&A manual, regular noise monitoring should be carried out once a week when noise generating activities are underway and the monitoring requirement is presented below:
- one set of Leq_(30min) measurements between 07:00 and 19:00 hours on normal weekdays
- 3.3.2 If construction works are extended to restricted hours 19:00-07:00 in normal working days (Monday to Saturday), and 00:00-24:00 during public holidays including Sunday, additional weekly impact monitoring should be carried out during the respective restricted hour periods. Leq_(5min) measurements should be employed during the restricted hours.

3.4 MONITORING EQUIPMENT

- 3.4.1 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.

3.4.2 Equipment used for construction noise monitoring is listed in *Table 3-3*.

Table 3-3 Construction Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	Rion NL-52
Calibrator	Rion NC-73
Portable Wind Speed Indicator	Anemometer AZ Instrument 8908 Wind Speed Indicator

3.5 MONITORING METHODOLOGY

- 3.5.1 All noise measurements will be performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (Leq). $Leq_{(30 \text{ min})}$ in six consecutive $Leq_{(5 \text{ min})}$ measurements will be used as the monitoring parameter for the time period between 07:00-19:00 hours on weekdays throughout the construction period.
- 3.5.2 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.
- 3.5.3 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.
- 3.5.4 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.
- 3.5.5 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme at yearly basis. Calibration certificates of all the noise monitoring equipment used for the impact monitoring program will be provided in each EM&A Monthly Report.

3.6 ACTION/LIMIT (A/L) LEVELS

- 3.6.1 Action and Limit levels for construction noise as stipulated in the approved Environmental Monitoring and Audit Manual are listed in *Tables 3-4*.

Table 3-4 Action and Limit Levels for Construction Noise

Monitoring Location	Action Level	Limit Level in dB(A)
Time Period:	0700-1900 hours on normal weekdays	
N1	When one or more documented complaints are received	75 dB(A)
N2a		
N3a		
N4		
Time Period:	19:00-07:00 in normal working days (Monday to Saturday), and 00:00-24:00 during public holidays including Sunday	
N1	When one or more documented complaints are received	60 dB(A)
N2a		
N3a		
N4		

Note: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority should be followed.

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

3.7 DATA MANAGEMENT AND DATA QA/QC CONTROL

- 3.7.1 All monitoring data will be handled by the ET’s in-house data recording and management system. The monitoring data recorded in the equipment will be downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data will be input into a computerized database properly maintained by the ET.

4. CONSTRUCTION NOISE MONITORING

4.1 GENERAL

- 4.1.1 In the Reporting Period, construction noise monitoring was performed at monitoring location N1, N2a, N3a and N4. Additional weekly noise monitoring during restricted hours were also performed due to construction works were carried out during public holiday including Sunday. The noise monitoring schedule is presented in [Appendix F](#).
- 4.1.2 Valid calibration certificates of monitoring equipment are shown in [Appendix G](#) and the construction noise monitoring results are summarized in the following sub-sections.

4.2 RESULTS OF NOISE MONITORING

- 4.2.1 **20** sessions of daytime construction noise monitoring and **36** sessions of additional weekly monitoring during restricted hours were performed at the agreed monitoring locations in the reporting period. Since the noise measurement was made under free field condition, a façade correction of +3dB(A) was added according to acoustical principles and EPD guidelines. For the approved alternative monitoring locations N2a and N3a, an additional distance correction of +1 dB(A) and +3 dB(A) respectively were applied. The daytime noise monitoring results are summarized in [Table 4-1 to Table 4-4](#) and the noise monitoring result during restricted hours are summarized in [Table 4-5 to Table 4-8](#). The detailed noise monitoring data are presented in [Appendix H](#) and the relevant graphical plots are shown in [Appendix I](#).

Table 4-1 Daytime Construction Noise Impact Monitoring Results at N1

Date	Time of Starting	Time of Finishing	Measurement Result (dB(A))
			L _{eq30min}
5-May-23	13:45	14:15	62.3
11-May-23	9:15	9:45	63.5
17-May-23	9:23	9:58	72.6
23-May-23	10:00	10:30	62.9
29-May-23	10:11	10:41	66.5

Table 4-2 Daytime Construction Noise Impact Monitoring Results at N2a

Date	Time of Starting	Time of Finishing	Measurement Result (dB(A))
			L _{eq30min}
5-May-23	14:22	14:52	51.1
11-May-23	14:00	14:30	54.2
17-May-23	10:00	10:30	52.9
23-May-23	10:35	11:05	54.1
29-May-23	10:49	11:19	57.3

Table 4-3 Daytime Construction Noise Impact Monitoring Results at N3a

Date	Time of Starting	Time of Finishing	Measurement Result (dB(A))
			L _{eq30min}
5-May-23	13:00	13:30	66.5
11-May-23	10:20	10:50	70.6
17-May-23	14:20	14:50	74.0
23-May-23	9:20	9:50	66.6
29-May-23	11:26	11:56	69.9

Table 4-4 Daytime Construction Noise Impact Monitoring Results at N4

Date	Time of Starting	Time of Finishing	Measurement Result (dB(A))
			L _{eq30min}
5-May-23	15:03	15:33	64.1
11-May-23	13:17	13:47	64.7
17-May-23	13:25	13:55	63.6
23-May-23	11:14	14:44	65.6
29-May-23	9:32	10:02	67.4

Table 4-5 Additional Noise Impact Monitoring Results during Restricted Hours at N1

Date	Time of Starting	Time of Finishing	Measurement Result (dB(A))
			L _{eq5min}
4-May-23	19:05	19:10	58.2
7-May-23	9:56	10:01	45.1
9-May-23	19:15	19:20	59.3
14-May-23	11:13	11:18	48.2
15-May-23	19:27	19:32	45.5
21-May-23	10:22	10:27	49.7
24-May-23	19:10	19:15	56.0
28-May-23	10:08	10:13	53.2
31-May-23	19:10	19:15	57.6

Table 4-6 Additional Noise Impact Monitoring Results during Restricted Hours at N2a

Date	Time of Starting	Time of Finishing	Measurement Result (dB(A))
			L _{eq5min}
4-May-23	19:23	19:28	47.2
7-May-23	9:24	9:29	49.7
9-May-23	19:32	19:37	47.5
14-May-23	10:35	10:40	47.6
15-May-23	19:27	19:32	46.5
21-May-23	9:26	9:31	54.6
24-May-23	19:30	19:35	46.5
28-May-23	10:40	10:45	56.5
31-May-23	19:20	19:25	47.0

Table 4-7 Additional Noise Impact Monitoring Results during Restricted Hours at N3a

Date	Time of Starting	Time of Finishing	Measurement Result (dB(A))
			L _{eq5min}
4-May-23	20:30	20:35	51.6
7-May-23	11:07	11:12	53.7
9-May-23	20:35	20:40	57.6
14-May-23	9:31	9:36	55.8
15-May-23	20:42	20:47	55.2
21-May-23	11:08	11:13	56.3
24-May-23	20:35	20:40	58.8
28-May-23	9:36	9:41	57.2
31-May-23	20:30	20:35	56.6

Table 4-8 Additional Noise Impact Monitoring Results during Restricted Hours at N4

Date	Time of Starting	Time of Finishing	Measurement Result (dB(A))
			L _{eq5min}
4-May-23	20:05	20:10	56.6
7-May-23	10:29	10:34	47.7
9-May-23	20:05	20:10	59.0
14-May-23	10:07	10:12	48.3
15-May-23	20:05	20:10	57.7
21-May-23	9:52	9:57	50.2
24-May-23	19:08	19:13	45.7
28-May-23	11:19	11:24	51.6
31-May-23	19:58	20:03	47.0

4.2.2 As shown in **Table 4-1 to 4-4**, all the measured results during normal daytime were below 75dB(A) of the acceptance criteria. In addition, all the measured results during restricted hours shown in **Table 4-5 to 4-8** were below 60 dB(A) of the acceptance criteria as set out in Technical Memorandum on Noise from Construction Work other than Percussive Piling.

- 4.2.3 No adverse weather condition which may affect the monitoring result was encountered during the course of noise monitoring in the reporting period. Furthermore, no documented noise complaint is received, indicating no exceedance of Action Level.

5. WASTE MANAGEMENT

5.1 GENERAL WASTE MANAGEMENT

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

5.2 RECORDS OF WASTE QUANTITIES

5.2.1 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.

5.2.2 The quantities of waste for disposal in this Reporting Period are summarized in *Tables 5-1* and *5-2*.

Table 5-1 Summary of Quantities of Inert C&D Materials

Type of Waste	Quantity	Disposal Location
C&D Materials (Inert) ('000m ³)	0.779	-
Reused in this Contract (Inert) ('000m ³)	0	-
Reused in other Projects (Inert) ('000m ³)	0	-
Disposal as Public Fill (Inert) ('000m ³)	0.779	TM38

Table 5-2 Summary of Quantities of C&D Wastes

Type of Waste	Quantity	Disposal Location
Recycled Metal ('000kg)	0	-
Recycled Paper / Cardboard Packing ('000kg)	0	-
Recycled Plastic ('000kg)	0	-
Chemical Wastes ('000kg)	0	-
General Refuses ('000m ³)	0.104	NENT

6. Site Inspection

6.1 REQUIREMENTS

6.1.1 According to the approved EM&A Manual, the environmental site inspection shall be formulated by ET Leader. Weekly environmental site inspections should be carried out to confirm the environmental performance.

6.2 FINDINGS / DEFICIENCIES DURING THE REPORTING PERIOD

6.2.1 In the Reporting Period, joint site inspection for the Project to evaluate site environmental performance was carried out by the ER, IEC representative, ET and the Contractor on **3, 10, 17, 25 and 31 May 2023**. No non-compliance was noted.

6.2.2 The findings / deficiencies of the Project observed during the weekly site inspection are listed in **Table 6-1**.

Table 6-1 Site Observations during the Weekly Inspection

Date	Findings / Deficiencies	Follow-Up Status
3 May 2023	<ul style="list-style-type: none"> The Contractor was reminded to spray water regularly at haul road. 	Reminder only.
10 May 2023	<ul style="list-style-type: none"> The Contractor was advised to provide NRMM label for Roller within site area. The Contractor was reminded to place chemical containers inside drip tray within building structure. The Contractor was reminded to maintain the Noise Barrier within site area along hoarding. 	The roller was removed from site. Reminder only. Reminder only.
17 May 2023	<ul style="list-style-type: none"> The Contractor was reminded to remove stagnant water to prevent run out of site. 	Reminder only.
25 May 2023	<ul style="list-style-type: none"> No adverse environmental issue was observed. 	NA
31 May 2023	<ul style="list-style-type: none"> The Contractor was advised to dispose of cumulated construction waste within site area. The Contractor was reminded to maintain the noise barrier along site hoarding properly. 	The construction waste was disposed of regularly. Reminder only.

7. Environmental Complaint, Notifications of Summons and Successful Prosecutions

7.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

7.1.1 In the Reporting Period, no environmental complaint, summons and prosecution under the EM&A Programme was lodged for the project. The statistical summary table of environmental complaint is presented in *Tables 7-1, 7-2 and 7-3*.

Table 7-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 31 May 2023	0	7	NA

Table 7-2 Statistical Summary of Notification of Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Summons Nature
1 – 31 May 2023	0	0	NA

Table 7-3 Statistical Summary of Successful Prosecutions

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Prosecution Nature
1 – 31 May 2023	0	0	NA

8. Environmental Mitigation Implementation Schedule

8.1 GENERAL REQUIREMENTS

- 8.1.1 The environmental mitigation measures that recommended in the Environmental Mitigation Implementation Schedule (EMIS) in the approved EM&A Manual covered the issues of dust, noise, water and waste and they are summarized presented in [Appendix K](#).
- 8.1.2 AJAJV 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 AJAJV in this Reporting Period are summarized in [Table 8-1](#).

Table 8-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	<ul style="list-style-type: none"> Any wastewater generated was appropriately treated by treatment facilities; Drainage channels were provided to convey run-off into the treatment facilities; and Drainage systems were regularly and adequately maintained.
Air Quality	<ul style="list-style-type: none"> Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather; Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers; Cover all excavated or stockpile of dusty material by impervious sheeting or sprayed with water to maintain the entire surface wet; Public roads around the site entrance/exit had been kept clean and free from dust; and Tarpaulin covering of any dusty materials on a vehicle leaving the site.
Noise	<ul style="list-style-type: none"> Good site practices to limit noise emissions at the sources; Use of quiet plant and working methods; Use of site hoarding or other mass materials as noise barrier to screen noise at ground level of NSRs; Use of shrouds/temporary noise barriers to screen noise from relatively static PMEs; Alternative use of plant items within one worksite, where practicable.
Waste Management	<ul style="list-style-type: none"> Any excavated material should be reused on site as far as possible to minimize off-site disposal. Scrap metals or abandoned equipment should be recycled if possible; Waste arising should be kept to a minimum and be handled, transported and disposed of in a suitable manner; Trip ticket system for the disposal of C&D materials to any designed public filling facility and/or landfill was implemented; and Chemical waste shall be 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 was generally kept tidy and clean.

8.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH

- 8.2.1 Tentative construction activities to be undertaken in **June 2023** should be included:
- Granulation Building – Green roof, ABWF works, External ABWF works.
 - AD Tanks – Water tightness test for AD4; Mass concrete (bottom of tank) for AD2.
 - Footbridge – Offsite fabrication of bridge decking; Bridge decking installation

9. Conclusions and Recommendations

9.1 CONCLUSIONS

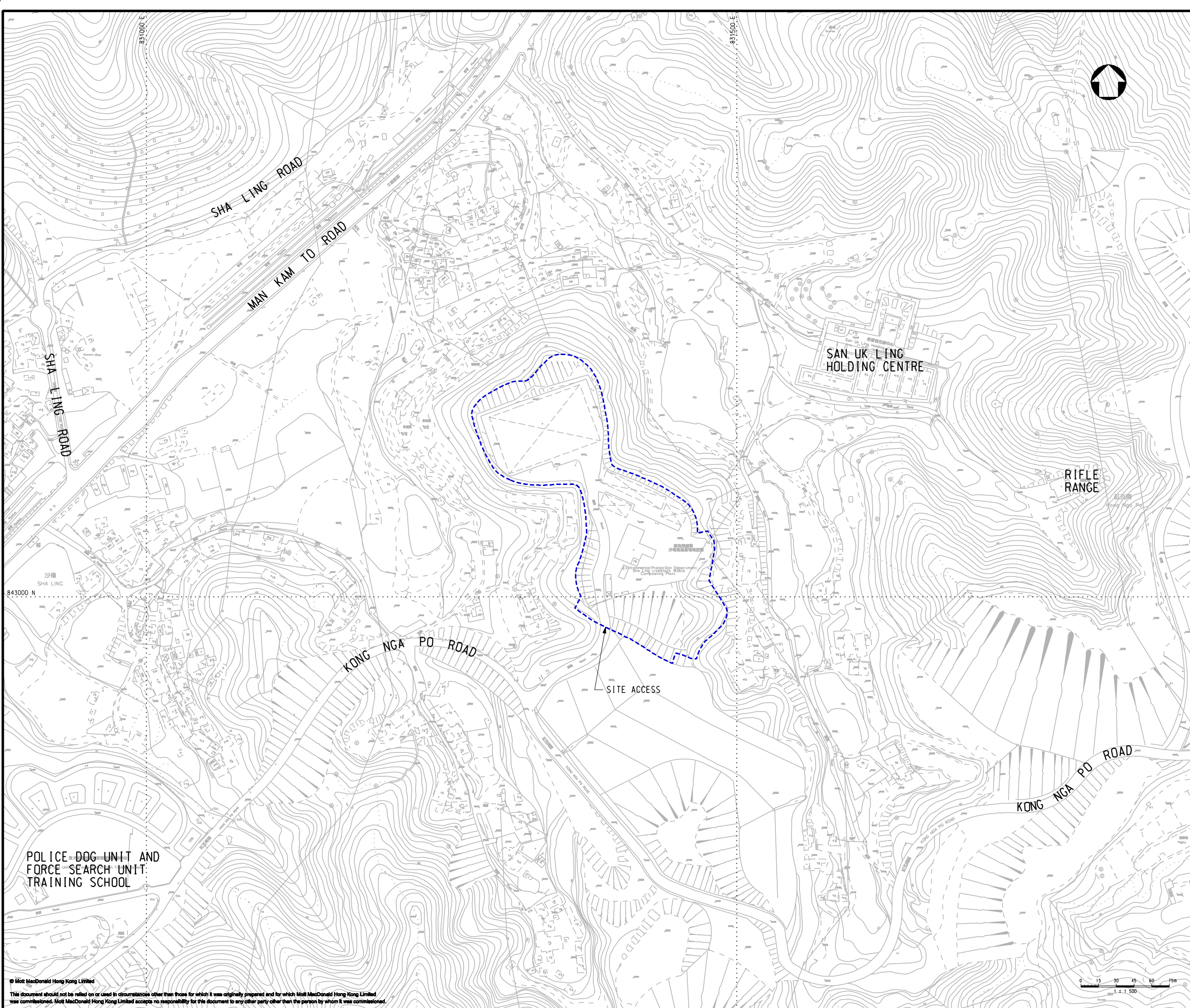
- 9.1.1 This is the monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from **1 to 31 May 2023**.
- 9.1.2 In the Reporting Period, no construction noise limit level exceedance during daytime and restricted hours was recorded. In addition, no noise complaint (which is an Action Level exceedance) was received by the Project Consultant, EPD and the Contractors.
- 9.1.3 In this Reporting Period, joint site inspection to evaluate the site environmental performance for the Project was carried out by the ER, IEC representative, ET and Contractor on **3, 10, 17, 25 and 31 May 2023**. No non-compliance was noted during the site inspection.
- 9.1.4 No documented complaint, notification of summons or successful prosecution was received under the Project.

9.2 RECOMMENDATIONS

- 9.2.1 Construction noise should be a key environmental impact during the works. The noise mitigation measures such as use of quiet plants or temporary noise barrier installation at the construction noise predominated area should be implemented in accordance with the EM&A requirement and the latest CNP.
- 9.2.2 In addition, all effluent discharge shall be ensured to fulfill the discharge licence stipulation.
- 9.2.3 All the trees proposed to be retained in-situ should be properly preserved and protected during the construction works. Tree Preservation and Protection Works for these retained trees shall follow Section 3 and 26 of CEDD's General Specification for Engineering Works and Section 26 of Contract Specification Part B.
- 9.2.4 Trees to be felled shall be in accordance with the Tree Preservation and Removal Proposal (TPRP) to be approved by relevant approval authority.
- 9.2.5 Contract Specification Part B Section 1.78 "Waste Management" and DEVB's "Guidelines on Yard Waste Reduction and Treatment" should be referred before tree removal and plan the necessary arrangement.


Appendix A

Layout plan of the Project




Notes

Key to symbols

 PROPOSED SITE AREA

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P2	JUN 13	MING	GENERAL REVISION	MR	AFK
P1	DEC 12	MING	FIRST ISSUE	MR	AFK



20/F Two Landmark East
100 How Ming Street
Kowloon
Hong Kong
T +852 2828 8757
F +852 2827 1823
www.mottmac.com.hk

Client



Environmental Protection Department
The Government of the Hong Kong
Special Administrative Region

Project

**AGREEMENT NO. CE34/2011(EP)
DEVELOPMENT OF ORGANIC WASTE
TREATMENT FACILITIES PHASE 2 -
FEASIBILITY STUDY**

Title

LOCATION OF THE PROJECT

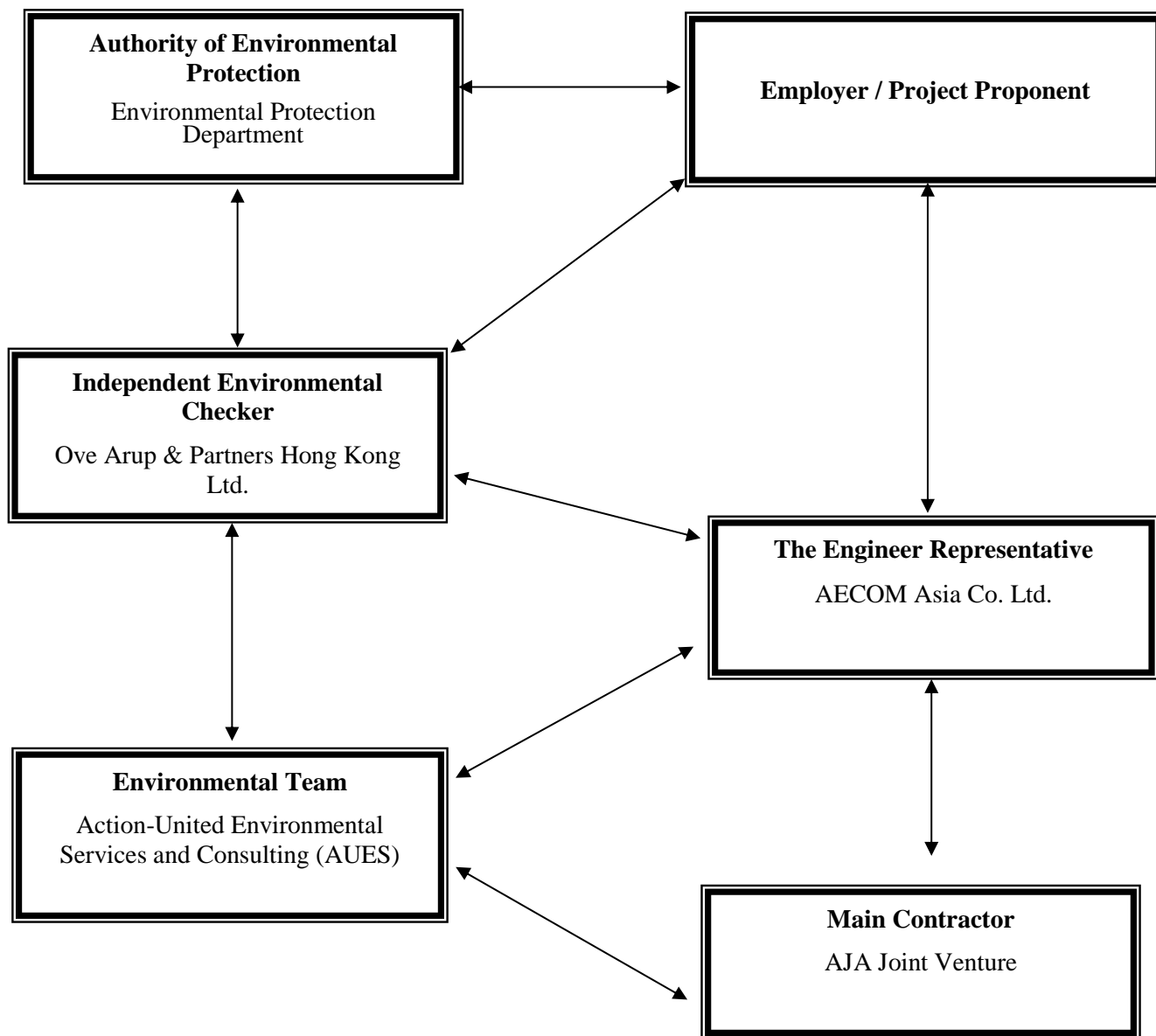
Designed	HY	Eng check	AT
Drawn	MING	Coordination	AT
Dwg check	HY	Approved	AFK
Scale at A1	1:1500	Status	PRE
Drawing Number		Rev	P2

FIGURE 1.1

Appendix B

Organization Chart

Project Organization Chart



Contact Details of Key Personnel for the Project

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
EPD	Project Proponent	Sunny Chiu	3151 7209	3528 0492
AECOM	Resident Engineer	Terrence Lam	5579 5239	3010 8507
AECOM	Resident Engineer	Ivan Yung	5723 7750	3010 8507
ARUP	Independent Environmental Checker	Ricky Chui	2268 3437	2268 3380
ARUP	Engineer (Safety, Environment and Planning)	Edmond Tang	3447 6181	2268 3955
AJAJV	Project Manager	Victor Wu	2862 5013	2862 5013
AJAJV	Construction Manager	Chris Leung	9210 7116	9210 7116
AJAJV	Project Environmental Manager	Samuel Tsui	9455 5865	6114 9590
AJAJV	Assistant Environmental Officer	Lee Yuk Lun	6416 5061	6114 9590
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
AUES	Environmental Consultant	Martin Li	2959 6059	2959 6079

Legend:

EPD (Employer) – Environmental Protection Department

AECOM (Engineer Representative) – AECOM Asia Co. Ltd.

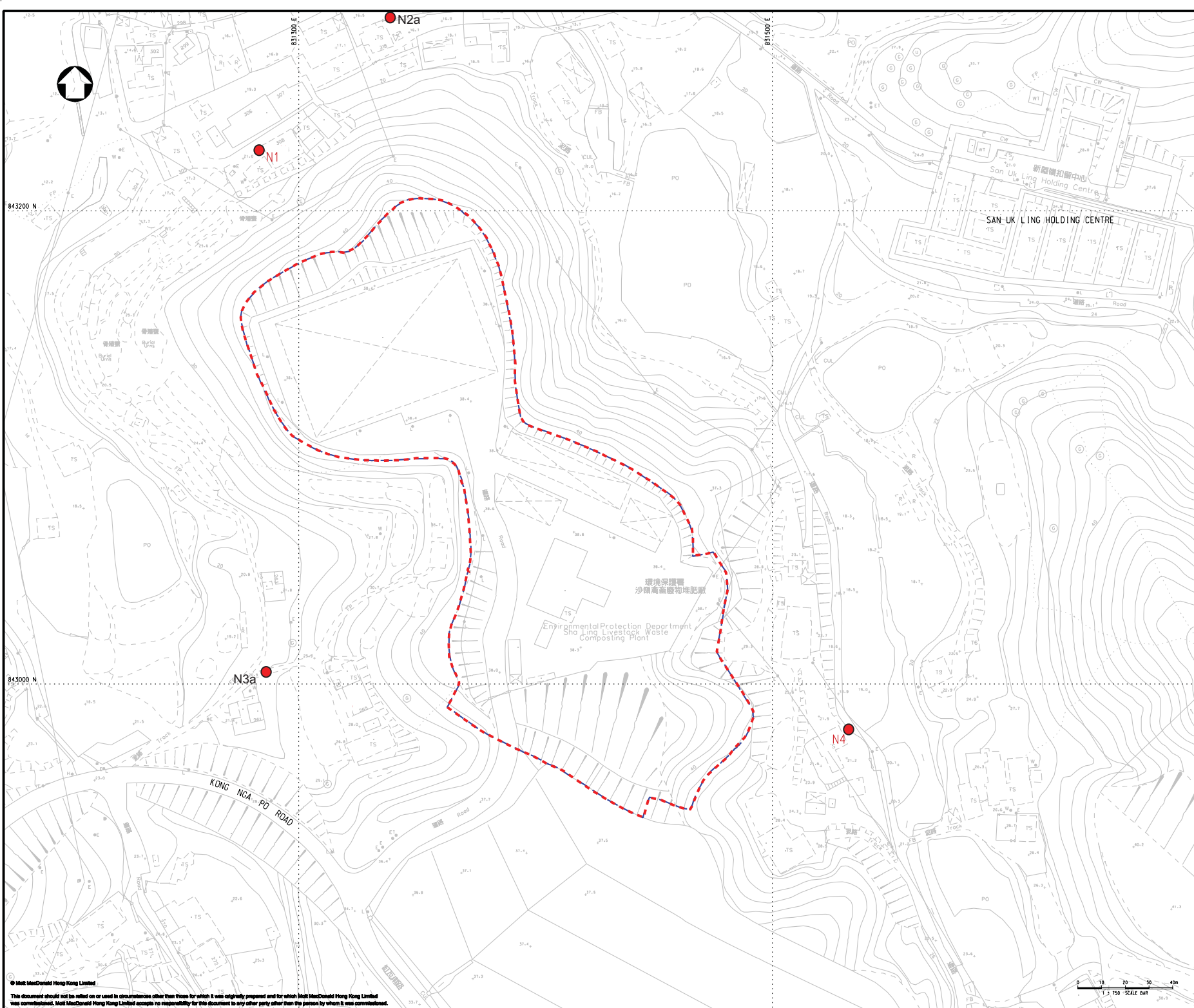
AJAJV (Main Contractor) – AJA Joint Venture

ARUP (IEC) – Ove Arup & Partners Hong Kong Ltd.

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

Appendix C

Monitoring Locations for Impact Monitoring



Notes

Key to symbols

- Construction Site Boundary
- Noise Monitoring Station

Reference drawings

P2	JUL 13	MING	GENERAL REVISION	AM	AFK
P1	DEC 12	MING	FIRST ISSUE	SC	AFK
Rev	Date	Drawn	Description	Chk'd	App'd

--	--	--	--	--	--



20F Two Landmark East
100 How Ming Street
Kowloon, Hong Kong
T +852 2828 8787
F +852 2827 1823
www.mottmac.com.hk

Client



Environmental Protection Department
The Government of the Hong Kong
Special Administrative Region

Project
AGREEMENT NO. CE34/2011(EP)
DEVELOPMENT OF ORGANIC WASTE TREATMENT FACILITIES PHASE 2 - FEASIBILITY STUDY

Title
PROPOSED LOCATIONS OF CONSTRUCTION NOISE MONITORING STATIONS

Designed	SC	Eng check	AT
Drawn	MING	Coordination	AT
Dwg check	EY	Approved	AFK
Scale at A1	1:750	Status	PRE
Drawing Number		Rev	P2

FIGURE 4.1

Appendix D

3-Month Rolling Construction Programme

Activity ID	Activity Name	Original Duration	Baseline Start Date	Baseline Finish Date	Start	Finish	2023				
							Mar	Apr	May	Jun	Jul
Contract No. EP/SP/86/15 - ORGANIC RESOURCE RECOVERY CENTRE, PHASE 2 (JULY 2022)							44	45	46	47	48
DESIGN											
CIVIL, STRUCTURAL AND BUILDING WORKS											
RECEPTION BUILDING (INCLUDING ADMINISTRATION BUILDING)											
RC WORKS - ADMINISTRATION BUILDING @ GL SA-SD/S2-S7 (INCLUDING STARCASE AREA) (ZONE 1)											
O2_CS2310a	ABWF Works (External concurrent with E&M Works)	90	07-Dec-22	28-Mar-23	07-Dec-22	28-Mar-23					
ANAEROBIC DIGESTION TANKS (4 AD Tanks)											
AD TANKS - FOUNDATION & RC WORKS (REMAINING 2 TANKS) (ZONE 2)											
ABWF WORKS											
O2_CS3320	Steel Structure Access & Walkway for Fourth Tank (Digester 1)	30	13-Feb-23	18-Mar-23	13-Feb-23	18-Mar-23*					
O2_CS3320a	Steel Structure Access & Walkway for Third Tank (Digester 3)	30	13-Feb-23	18-Mar-23	13-Feb-23	18-Mar-23*					
O2_CS3420	AWBF for Fourth Tank (Digester 1) concurrent with E&M Works	90	13-Mar-23	04-Jul-23	13-Mar-23	04-Jul-23					
O2_CS3421a	AWBF for Third Tank (Digester 3) concurrent with E&M Works	90	06-Mar-23	26-Jun-23	06-Mar-23	26-Jun-23					
BIOGAS STORAGE TANKS, DIGESTATE TANK & PUMP ROOM											
DIGESTATE PUMP ROOM (ZONE 2)											
O2_CS3630a	External ABWF Works (concurrent with E&M Works)	60	30-Dec-22	14-Mar-23	30-Dec-22	14-Mar-23					
PUMP HOUSE (ZONE 2)											
O2_CS3740	External ABWF Works (concurrent with E&M Installation)	90	02-Dec-22	23-Mar-23	02-Dec-22	23-Mar-23					
BOUNDARY WALL (ZONE 2)											
WEIGHBRIDGES & GUARD HOUSE											
O2_CS5040	External ABWF Work (concurrent with E&M Works)	60	24-Dec-22	10-Mar-23	24-Dec-22	10-Mar-23					
MASTER METER ROOM											
O2_CS6210	Master Meter Room - ABWF Works	40	28-Jan-23	15-Mar-23	28-Jan-23	15-Mar-23					
ENTRANCE PORTAL											
O2_CS6010	Entrance Portal Structural Works	54	29-Dec-22	06-Mar-23	29-Dec-22	06-Mar-23					
EXTERNAL WORKS											
O2_CS6100	CLP Install Cables	60	12-Jan-23	25-Mar-23	12-Jan-23	25-Mar-23					
O2_CS6230a	Carpark	30	22-Mar-23	29-Apr-23	22-Mar-23	29-Apr-23					
ACCESS ROAD											
O2_CS6640	Access / EVA Road Construction	120	30-Nov-22	29-Apr-23	30-Nov-22	29-Apr-23					
O2_CS6650	Road marking, traffic signs, road lighting, crash barrier	55	21-Feb-23	29-Apr-23	21-Feb-23	29-Apr-23					
OTHER MAJOR EQUIPMENT FABRICATION & DELIVERY											
O2_C9220	Delivery of SCADA System & Assn. Control Panels/ Consoles	30	09-Feb-23	10-Mar-23	09-Feb-23	10-Mar-23					
E & M INSTALLATION WORKS											
SITE ACCESS DATES FOR E&M INSTALLATION											
O2_EMA6100	Complete Civil Readiness for AD Steel Structure Access & Walkways (1 & 3)	0		18-Mar-23		18-Mar-23*					
O2_EMA6170	Complete Mass Concrete & Civil Readiness (AD1)	0		18-Mar-23		18-Mar-23*					
O2_EMA6180	Complete Mass Concrete & Civil Readiness (AD3)	0		09-Mar-23		09-Mar-23					
ZONE 1 - WASTE RECEPTION BUILDING AREA											
O2_EM1040	Install Hammermills 1 & 2	12	20-Feb-23	04-Mar-23	20-Feb-23*	04-Mar-23					
O2_EM1045	Install Contaminants Press & Discharge Screw Conveyor 1 & 2	10	22-Feb-23	04-Mar-23	22-Feb-23	04-Mar-23					
O2_EM1050f	Install Hammermills 3 & 4	20	09-Mar-23	31-Mar-23	09-Mar-23	31-Mar-23					
O2_EM1055f	Install Contaminants Press & Discharge Screw Conveyor 3 & 4	20	09-Mar-23	31-Mar-23	09-Mar-23	31-Mar-23					
O2_EM1062f	Install Inclined Screw Conveyors 2 & 4	30	20-Feb-23	25-Mar-23	20-Feb-23*	25-Mar-23					
O2_EM1065f	Install Bunker Lids	32	06-Mar-23	15-Apr-23	06-Mar-23*	15-Apr-23					
O2_EM1080	Install Bin Emptying & Cleaning System	20	21-Mar-23	17-Apr-23	21-Mar-23	17-Apr-23					
O2_EM1174e	Process Piping Installation	90	19-Jan-23	15-May-23	19-Jan-23	15-May-23					
O2_EM1175	Tanker Bay Installation	28	01-Mar-23	01-Apr-23	01-Mar-23	01-Apr-23					
O2_EM1176e	Compressed Air System Installation at WRB	60	20-Feb-23	05-May-23	20-Feb-23*	05-May-23					
O2_EM1180f	Install Roller Shutter	30	03-Apr-23	12-May-23	03-Apr-23*	12-May-23					
O2_EM1190f10	MCC 2	30	01-Feb-23	07-Mar-23	01-Feb-23*	07-Mar-23					
O2_EM1200	Electrical Installation	80	20-Jan-23	04-May-23	20-Jan-23	04-May-23					
O2_EM1250	E&M Installation for Server Rm	45	06-Mar-23	02-May-23	06-Mar-23*	02-May-23					
O2_EM1280	BS Installation for Waste Reception Area - 2nd Fix	90	07-Jan-23	03-May-23	07-Jan-23	03-May-23					



File Name: WP_06E.2022_R4
 Layout: ORRC2_WP_2022_3M(C)
 TASK filters: 3MK, 3MN, 3MRP., 3MRP._1.
 Date Printed: 22-Jul-22
 Page 1 of 4



Contract No. EP/SP/86/15
Organic Waste Treatment Facilities, Phase 2
3-Months Rolling Programme

Date	Revision	Checked	Approved
31-Mar-23			

Activity ID	Activity Name	Original Duration	Baseline Start Date	Baseline Finish Date	Start	Finish	2023					
							Mar 44	Apr 45	May 46	Jun 47	Jul 48	
ZONE 1 - ADMINISTRATION BUILDING												
O2_EM7020	BS Installation for Admin Bldg.- 2nd Fix	60	03-Jan-23	18-Mar-23	03-Jan-23*	18-Mar-23						
O2_EM7060	MVAC Installation at Admin Bldg.	185	18-Jul-22	02-Mar-23	18-Jul-22A	02-Mar-23						
O2_EM7120	FS Control Rooms Installation	75	08-Dec-22	14-Mar-23	08-Dec-22	14-Mar-23						
ZONE 2 - ANAEROBIC DIGESTION TREATMENT SYSTEM, BIOGAS AREA & PUMP HOUSE												
O2_EM2030e	Composite Pipe Rack Installation	58	22-Feb-23	29-Apr-23	22-Feb-23	29-Apr-23						
O2_EM2045	Biogas Tank 1 Installation - Tank Internal & Asso. Fittings	15	28-Feb-23	16-Mar-23	28-Feb-23	16-Mar-23						
O2_EM2065	Biogas Tank 2 Installation - Tank Internal & Asso. Fittings	10	17-Mar-23	28-Mar-23	17-Mar-23	28-Mar-23						
O2_EM2080	Digestate Tank Installation	25	27-Feb-23	27-Mar-23	27-Feb-23*	27-Mar-23						
O2_EM2100	Carbon Filter Area / Gas Dehumidifier / Gas Pre-treatment Installation	25	03-Mar-23	31-Mar-23	03-Mar-23	31-Mar-23						
O2_EM2120	Digestate Pump Rm Installation	25	01-Mar-23	29-Mar-23	01-Mar-23	29-Mar-23						
O2_EM2140	Pump House Installation	55	14-Jan-23	24-Mar-23	14-Jan-23*	24-Mar-23						
O2_EM2160	Flare Installation	30	20-Mar-23	27-Apr-23	20-Mar-23*	27-Apr-23						
O2_EM2200	Process Piping Installation	90	08-Mar-23	28-Jun-23	08-Mar-23	28-Jun-23						
O2_EM2220	MCC 3	20	22-Feb-23	16-Mar-23	22-Feb-23*	16-Mar-23						
O2_EM2230f	Electrical Installation	80	01-Feb-23	10-May-23	01-Feb-23	10-May-23						
O2_EM2240	BS Installation for AD Area	60	06-Mar-23	19-May-23	06-Mar-23*	19-May-23						
O2_EM2300f	Installation for Ferric Chloride System	60	31-Dec-22	17-Mar-23	31-Dec-22	17-Mar-23						
O2_EM3216a_x7	Install Stirrers (Digester 3)	12	10-Mar-23	23-Mar-23	10-Mar-23	23-Mar-23						
O2_EM3220_x7	Install Stirrers (Digester 1)	12	18-Mar-23	31-Mar-23	18-Mar-23	31-Mar-23						
ZONE 3 - HEAT RECOVERY AND POWER GENERATION												
O2_EM3010	Stand By Boiler Installation	45	22-Feb-23	19-Apr-23	22-Feb-23	19-Apr-23						
O2_EM3020	Transformers Rm Installation	70	17-Dec-22	17-Mar-23	17-Dec-22	17-Mar-23						
O2_EM3025a	HV Switch Rm Installation	60	20-Feb-23	05-May-23	20-Feb-23*	05-May-23						
O2_EM3040	Main LVSB	25	01-Mar-23	29-Mar-23	01-Mar-23*	29-Mar-23						
O2_EM3080	CHP Heat Exchange, Silencers & Auxiliary Equipment Installation	95	22-Feb-23	19-Jun-23	22-Feb-23	19-Jun-23						
O2_EM3100	Flue Stack Installation	75	29-Mar-23	03-Jul-23	29-Mar-23	03-Jul-23						
O2_EM3160	Piping Installation	90	14-Mar-23	05-Jul-23	14-Mar-23	05-Jul-23						
O2_EM3200	BS Installation for CHP Area - 2nd Fix	60	28-Jan-23	12-Apr-23	28-Jan-23	12-Apr-23						
ZONE 4 - DEWATERING AND GRANULATION SYSTEM												
O2_EM4080c	Granulation Bagging & Screen Plant Installation	60	14-Dec-22	02-Mar-23	14-Dec-22	02-Mar-23						
O2_EM4082e	Process Piping Installation EC Granulation	72	12-Jan-23	15-Apr-23	12-Jan-23	15-Apr-23						
O2_EM4100c	MCC 4	20	17-Mar-23	08-Apr-23	17-Mar-23*	08-Apr-23						
O2_EM4110e	Electrical Installation for Granulation	70	31-Jan-23	26-Apr-23	31-Jan-23	26-Apr-23						
O2_EM4120c	Control Rm Installation	45	08-Feb-23	31-Mar-23	08-Feb-23	31-Mar-23						
O2_EM4160c	BS Installation for Granulation Building - 2nd Fix	60	02-Feb-23	17-Apr-23	02-Feb-23	17-Apr-23						
ZONE 4 - CENTRALISED AIR POLLUTION CONTROL SYSTEM												
O2_EM1180	Odour Ducts, Dampers, Booster Fans and Instruments Installation at WRB	90	12-Dec-22	04-Apr-23	12-Dec-22*	04-Apr-23						
O2_EM2180	Odour Ducts, Dampers, Booster Fans and Instruments Installation from AD to Roof of GB	50	28-Feb-23	02-May-23	28-Feb-23	02-May-23						
O2_EM4085e	Odour Ducts, Dampers, Booster Fans and Instruments Installation at GB	60	19-Dec-22	07-Mar-23	19-Dec-22*	07-Mar-23						
O2_EM4552e	Recycling Pumps and Associated Pipework Installation	20	13-Feb-23	07-Mar-23	13-Feb-23	07-Mar-23						
O2_EM4554e	Make-up Water Tanks, Pumps and Associated Pipework Installation	20	18-Feb-23	13-Mar-23	18-Feb-23	13-Mar-23						
O2_EM4580	CAPC Stack Installation	20	02-Mar-23	24-Mar-23	02-Mar-23*	24-Mar-23						
O2_EM4600	MCC 6	20	04-Apr-23	26-Apr-23	04-Apr-23*	26-Apr-23						
O2_EM4610e	Electrical Installation	75	07-Feb-23	10-May-23	07-Feb-23	10-May-23						
O2_EM5330f	Odour Ducts, Dampers, Booster Fans and Instruments Installation at WWTP	45	06-Mar-23	02-May-23	06-Mar-23*	02-May-23						
O2_EM6100	Odour Ducts, Dampers, Booster Fans and Instruments Installation at Footbridge	30	27-Feb-23	01-Apr-23	27-Feb-23*	01-Apr-23						
ZONE 5 - WASTEWATER TREATMENT SYSTEM												
O2_EM5020	Air Blower for Phospaq & Aerobic Tank Installation (2 nos.)	30	20-Feb-23	25-Mar-23	20-Feb-23*	25-Mar-23						
O2_EM5040e	Air Blower for MBR Installation (2 nos.)	30	20-Feb-23	25-Mar-23	20-Feb-23	25-Mar-23						
O2_EM5044e	Air Blower for Anammox Installation (3 nos.)	25	27-Feb-23	27-Mar-23	27-Feb-23	27-Mar-23						
O2_EM5050e	Air Pipework Installation (Carbon Steel Pipework)	70	01-Apr-23	21-Jun-23	01-Apr-23*	21-Jun-23						
O2_EM5080e	Anammox Reactor Tank Internal Equipment Installation (Diffusers, Air Grid) - T9 & 10	94	07-Nov-22	04-Mar-23	07-Nov-22*	04-Mar-23						
O2_EM5082e	Anammox Influent and Effluent Tanks Installation (Pumps and Mixer) - T12 & 13	60	05-Jan-23	21-Mar-23	05-Jan-23	21-Mar-23						

Date	Revision	Checked	Approved
31-Mar-23			



File Name: WP_06E.2022_R4
 Layout: ORRC2_WP_2022_3M(C)
 TASK filters: 3MK, 3MN, 3MRP., 3MRP._1.
 Date Printed: 22-Jul-22

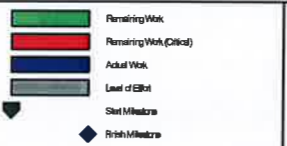
■ Remaining Work
■ Remaining Work (Critical)
■ Actual Work
■ Level of Effort
■ Start Milestone
◆ Finish Milestone

Contract No. EP/SP/86/15
Organic Waste Treatment Facilities, Phase 2
3-Months Rolling Programme

Activity ID	Activity Name	Original Duration	Baseline Start Date	Baseline Finish Date	Start	Finish	2023				
							Mar	Apr	May	Jun	Jul
O2_EM5100e	Bioreactor Tanks Internal Installation (Ejector and Air Pipework) - T1, 5 & 7	24	20-Feb-23	18-Mar-23	20-Feb-23*	18-Mar-23	44	45	46	47	48
O2_EM5110f	Bioreactor Tanks Internal Installation (Ejector and Air Pipework) - T2, 6 & 8	24	20-Feb-23	18-Mar-23	20-Feb-23	18-Mar-23					
O2_EM5120	DAF Installation Including Sludge Pumps and Flocculation Tube	56	05-Jan-23	16-Mar-23	05-Jan-23	16-Mar-23					
O2_EM5140e	Sludge Holding Tank Internal Installation (Submersible Pumps) - T4	20	28-Feb-23	22-Mar-23	28-Feb-23	22-Mar-23					
O2_EM5142e	Wastewater Effluent Tank Internal Installation (Submersible Pumps) - T3	20	28-Feb-23	22-Mar-23	28-Feb-23	22-Mar-23					
O2_EM5160e	Neutralisation Tank and Treated Effluent Tank Internal Equipment Installation - T14 & 15	18	07-Mar-23	27-Mar-23	07-Mar-23	27-Mar-23					
O2_EM5162e	Pump Pit Internal Installation (Injector Pumps and AO Recycle Pumps)	22	06-Mar-23	30-Mar-23	06-Mar-23*	30-Mar-23					
O2_EM5200	MBR Tanks Internal Installation (Membranes Rack and Air Pipework) - T16 & 17	60	14-Jan-23	30-Mar-23	14-Jan-23	30-Mar-23					
O2_EM5210e	RO Plant Installation (UF, RO, feed pumps, and Permeate Tank)	30	06-Mar-23	13-Apr-23	06-Mar-23*	13-Apr-23					
O2_EM5220	Process Pipework Installation (Prefabricated SS316 Pipework)	90	16-Feb-23	07-Jun-23	16-Feb-23*	07-Jun-23					
O2_EM5230e	Compressed Air System & Pipework Installation	90	27-Feb-23	17-Jun-23	27-Feb-23	17-Jun-23					
O2_EM5240e	MCC 5	28	25-Mar-23	26-Apr-23	25-Mar-23*	26-Apr-23					
O2_EM5242e	Electrical Installation	75	07-Feb-23	10-May-23	07-Feb-23	10-May-23					
O2_EM5300e	Polymer Dosing System Installation (Pumps Skid and Storage Tank)	18	27-Feb-23	18-Mar-23	27-Feb-23*	18-Mar-23					
O2_EM5302e	HCl Dosing System Installation (Pumps Skid and Storage Tank)	20	24-Feb-23	18-Mar-23	24-Feb-23	18-Mar-23					
O2_EM5304e	NaOH Dosing System Installation (Pumps Skid and Storage Tank)	20	24-Feb-23	18-Mar-23	24-Feb-23	18-Mar-23					
O2_EM5306e	NaOCl Dosing System Installation (Pumps Skid and Storage Tank)	20	24-Feb-23	18-Mar-23	24-Feb-23	18-Mar-23					
O2_EM5308e	NaHSO4 Dosing System Installation (Pumps Skid and Storage Tank)	14	03-Mar-23	18-Mar-23	03-Mar-23	18-Mar-23					
O2_EM5310e	Micro Nutrient Dosing System Installation (Pumps Skid and Storage Tank)	14	10-Mar-23	25-Mar-23	10-Mar-23	25-Mar-23					
O2_EM5312e	H2SO4 Dosing System Installation (Pumps Skid and Storage Tank)	14	10-Mar-23	25-Mar-23	10-Mar-23	25-Mar-23					
O2_EM5314e	Glucose Dosing System Installation (Pumps Skid and Storage Tank)	14	10-Mar-23	25-Mar-23	10-Mar-23	25-Mar-23					
O2_EM5316e	Citric Acid Dosing System Installation (Pumps Skid and Storage Tank)	14	10-Mar-23	25-Mar-23	10-Mar-23	25-Mar-23					
O2_EM5318e	Chemical Pipework Installation Including Double Containment Pipework	50	13-Mar-23	15-May-23	13-Mar-23	15-May-23					
O2_EM5360	BS Installation for WWTP - 2nd Fix	50	27-Feb-23	29-Apr-23	27-Feb-23*	29-Apr-23					
ANCILLARY SYSTEM											
O2_EM6000	Genset & Asso. Equipment at Reception Bldg	45	12-Jan-23	10-Mar-23	12-Jan-23*	10-Mar-23					
O2_EM6020	Genset & Asso. Equipment at Granulation Bldg	55	12-Jan-23	22-Mar-23	12-Jan-23*	22-Mar-23					
O2_EM6030e	Genset & Asso. Equipment at Pump House	65	12-Jan-23	03-Apr-23	12-Jan-23*	03-Apr-23					
O2_EM6040	Vehicle Washing Plant	60	09-Mar-23	23-May-23	09-Mar-23	23-May-23					
O2_EM6060	Weighbridge Installation	74	28-Feb-23	31-May-23	28-Feb-23	31-May-23					
O2_EM6080	Surplus Energy Export System Installation (GCA)	75	17-Mar-23	19-Jun-23	17-Mar-23*	19-Jun-23					
O2_EM6120	Plantwide Electrical Wiring for Process Plant	60	20-Feb-23	05-May-23	20-Feb-23*	05-May-23					
O2_EM6140	SCADA System & Associated Control Panels / Consoles	95	11-Mar-23	08-Jul-23	11-Mar-23	08-Jul-23					
O2_EM6160	Traffic Control Installation	120	27-Feb-23	25-Jul-23	27-Feb-23	25-Jul-23					
O2_EM6180	BMS Installation	90	13-Mar-23	04-Jul-23	13-Mar-23*	04-Jul-23					
O2_EM6500	Sitewide Process Pipe	270	20-May-22	19-Apr-23	20-May-22 A	19-Apr-23					
BUILDING SERVICES											
O2_EM7010f	LVSF for BS	25	10-Apr-23	08-May-23	10-Apr-23*	08-May-23					
O2_EM7020f	MCC7 & Electrical Installation	22	11-Apr-23	06-May-23	11-Apr-23*	06-May-23					
O2_EM7040	Cooling Tower, Chiller Plant and Pump at Granulation Bldg.	75	28-Dec-22	31-Mar-23	28-Dec-22	31-Mar-23					
O2_EM7100	FS & SPR Pump and Tank Rm Installation at Granulation Bldg	60	28-Dec-22	14-Mar-23	28-Dec-22	14-Mar-23					
O2_EM7140	Lift Installation - Reception Bldg (Admin Bldg)	75	15-Dec-22	21-Mar-23	15-Dec-22*	21-Mar-23					
O2_EM7160	Lift Installation - Reception Bldg	75	11-Jan-23	18-Apr-23	11-Jan-23*	18-Apr-23					
O2_EM7180	Lift Installation - Granulation Bldg	70	31-Jan-23	26-Apr-23	31-Jan-23	26-Apr-23					
O2_EM7500	P&ID Installation	60	30-Jan-23	13-Apr-23	30-Jan-23*	13-Apr-23					
O2_EM7600	ELV Installation	60	09-Mar-23	23-May-23	09-Mar-23	23-May-23					
O2_EM7700	BS Installation - Guard House	60	03-Jan-23	18-Mar-23	03-Jan-23	18-Mar-23					
STATUTORY INSPECTION (FSD, WA, EMSD)											
GENERAL NOTES FOR STATUTORY INSPECTION											
O2_EM8100	External Drainage (storm + sewer) - Last manhole connected	0		03-Jul-23		03-Jul-23					◆ 03-Jul-23
O2_EM8110	Necessary ABWF completed for Stat. Inspections and Building scaffolds removed	0		29-Apr-23		29-Apr-23					◆ 29-Apr-23
O2_EM8120	EVA (Emergency Vehicle Access) completed	0		29-Apr-23		29-Apr-23					◆ 29-Apr-23
O2_EM8130	Building Services Completed (FS, Elec, P&ID)	0		23-May-23		23-May-23					◆ 23-May-23
PERMANENT POWER / INSTALL METER (CLP)											

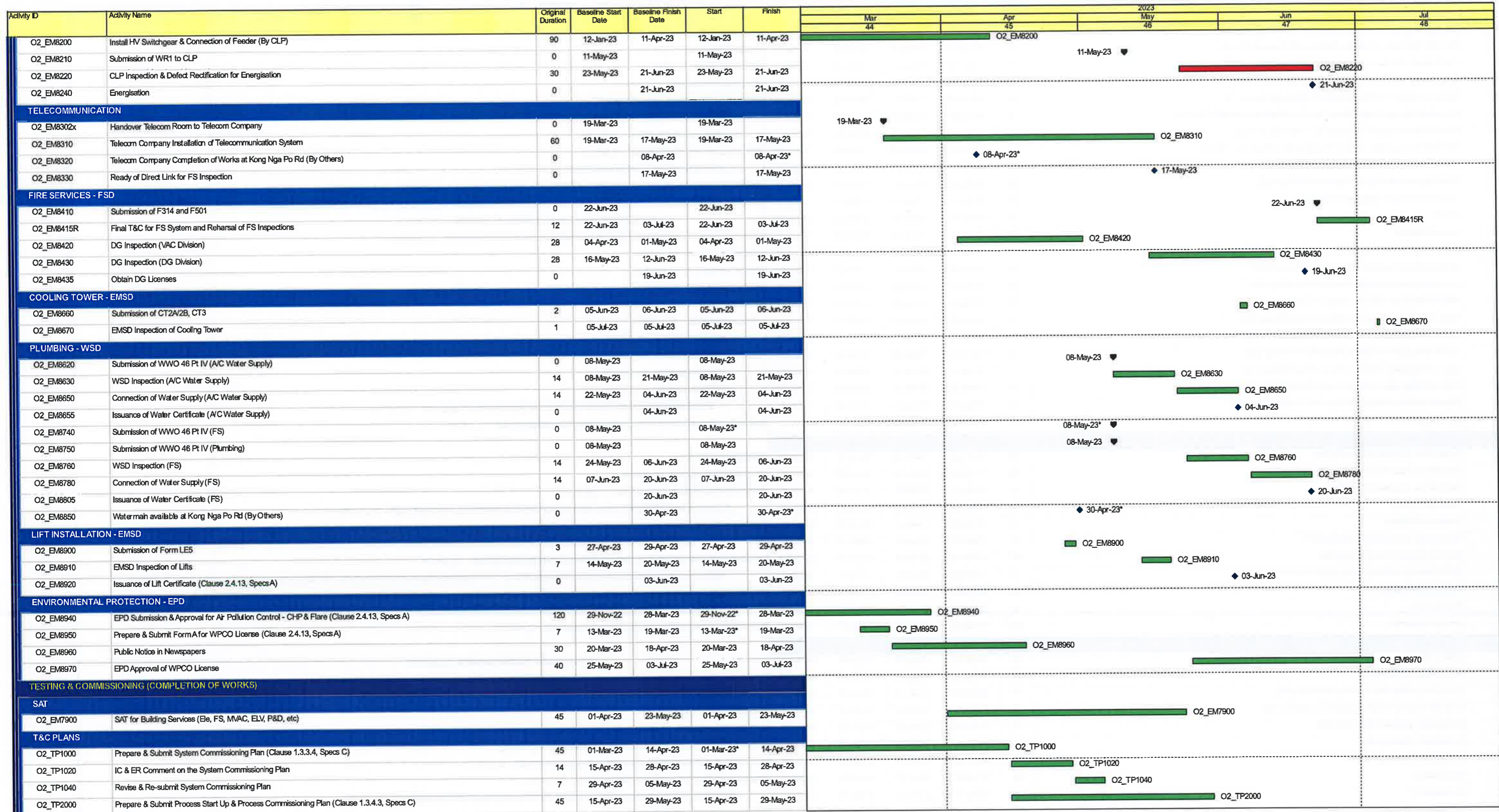


File Name: WP_06E.2022_R4
 Layout: ORRC2_WP_2022_3M(C)
 TASK filters: 3MK, 3MN, 3MRP., 3MRP_1.
 Date Printed: 22-Jul-22
 Page 3 of 4



Contract No. EP/SP/86/15
Organic Waste Treatment Facilities, Phase 2
3-Months Rolling Programme

Date	Revision	Checked	Approved
31-Mar-23			



File Name: WP_06E.2022_R4
 Layout: ORRC2_WP_2022_3M(C)
 TASK filters: 3MK, 3MN, 3MRP., 3MRP._1.
 Date Printed: 22-Jul-22
 Page 4 of 4



Contract No. EP/SP/86/15
Organic Waste Treatment Facilities, Phase 2
3-Months Rolling Programme

Date	Revision	Checked	Approved
31-Mar-23			

Appendix E

Event and Action Plan

Event and Action Plan for Construction Noise

Event	Action			
	ET	IEC	ER	Contractor
Action Level Exceedance	<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 investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Advise the ER on the effectiveness of the proposed remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level Exceedance	<ol style="list-style-type: none"> 1. Inform IEC, ER, EPD and Contractor; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with IEC, Contractor and ER on remedial measures required; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET Leader and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes exceedance until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Appendix F

Impact Monitoring Schedule of the Reporting Period and Coming Month

Impact Monitoring Schedule for reporting period – May 2023

Date		Noise Monitoring (Leq30min)
Mon	1-May-23	
Tue	2-May-23	
Wed	3-May-23	
Thu	4-May-23	
Fri	5-May-23	✓
Sat	6-May-23	
Sun	7-May-23	
Mon	8-May-23	
Tue	9-May-23	
Wed	10-May-23	
Thu	11-May-23	✓
Fri	12-May-23	
Sat	13-May-23	
Sun	14-May-23	
Mon	15-May-23	
Tue	16-May-23	
Wed	17-May-23	✓
Thu	18-May-23	
Fri	19-May-23	
Sat	20-May-23	
Sun	21-May-23	
Mon	22-May-23	
Tue	23-May-23	✓
Wed	24-May-23	
Thu	25-May-23	
Fri	26-May-23	
Sat	27-May-23	
Sun	28-May-23	
Mon	29-May-23	✓
Tue	30-May-23	
Wed	31-May-23	

Remark:

	Public Holiday or Sunday
--	--------------------------

✓ Impact noise monitoring in normal working days (Monday to Saturday) 07:00 – 19:00 except public holiday
 # Additional weekly impact monitoring during restricted hours including public holidays and Sundays

Impact Monitoring Schedule for coming month – May 2023

Date		Noise Monitoring (Leq30min)
Thu	1-Jun-23	
Fri	2-Jun-23	
Sat	3-Jun-23	
Sun	4-Jun-23	
Mon	5-Jun-23	
Tue	6-Jun-23	
Wed	7-Jun-23	
Thu	8-Jun-23	
Fri	9-Jun-23	✓
Sat	10-Jun-23	
Sun	11-Jun-23	
Mon	12-Jun-23	
Tue	13-Jun-23	
Wed	14-Jun-23	
Thu	15-Jun-23	✓
Fri	16-Jun-23	
Sat	17-Jun-23	
Sun	18-Jun-23	
Mon	19-Jun-23	
Tue	20-Jun-23	✓
Wed	21-Jun-23	
Thu	22-Jun-23	
Fri	23-Jun-23	
Sat	24-Jun-23	
Sun	25-Jun-23	
Mon	26-Jun-23	✓
Tue	27-Jun-23	
Wed	28-Jun-23	
Thu	29-Jun-23	
Fri	30-Jun-23	

Remark:

	Public Holiday or Sunday
--	--------------------------

✓ Impact noise monitoring in normal working days (Monday to Saturday) 07:00 – 19:00 except public holiday

Appendix G

Calibration Certificates of Equipment



Certificate of Calibration

校正證書

Certificate No. : C224779
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC22-1539) Date of Receipt / 收件日期 : 4 August 2022
Description / 儀器名稱 : Sound Level Calibrator (EQ085)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NC-73
Serial No. / 編號 : 10655561
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 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 20 August 2022

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification & user's specified acceptance criteria.
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

Tested By : 
測試 : H T Wong
Assistant Engineer

Certified By : 
核證 : K C Lee
Engineer

Date of Issue : 23 August 2022
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.

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. : C224779
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 :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C223647
CL281	Multifunction Acoustic Calibrator	AV210017
TST150A	Measuring Amplifier	C221750

- 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	± 0.5	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	User's Spec.	Uncertainty of Measured Value (Hz)
1	0.953	1 kHz ± 6 %	± 1

Remarks : - The user's specified acceptance criteria (user's spec.) is a customer pre-defined operating tolerance of the UUT, suitable for one's own intended use.

- 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.

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所書面批准。

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

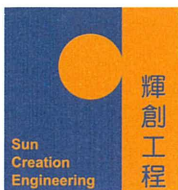
c/o 香港新界屯門興安里一號四樓

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. : C226781
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC22-2282) Date of Receipt / 收件日期 : 8 November 2022
Description / 儀器名稱 : Sound Level Meter (EQ016)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 00464681
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 : 19 November 2022

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
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

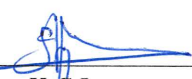
Tested By
測試

:


H T Wong
Assistant Engineer

Certified By
核證

:


K C Lee
Engineer

Date of Issue
簽發日期

:

21 November 2022

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所書面批准。

Certificate of Calibration

校正證書

Certificate No. : C226781

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	C220381
CL281	Multifunction Acoustic Calibrator	AV210017

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		103.5
				114.00		113.5

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.

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. : C226781

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)
					16 kHz	85.6	-6.6 (+3.5 ; -17.0)

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	92.7	-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)
					16 kHz	83.7	-8.5 (+3.5 ; -17.0)

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。



Certificate of Calibration 校正證書

Certificate No. : C226781
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 17434

- 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
	16 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.

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所書面批准。

Appendix H

Database of Monitoring Results

Daytime Noise Measurement Results (dB) of N1																					
Date	Start Time	1st Leq (5min)			2nd Leq (5min)			3rd Leq (5min)			4th Leq (5min)			5th Leq (5min)			6th Leq (5min)			Leq30min, dB(A)	Façade Correction
		Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)		
5-May-23	13:45	66.3	50.5	46.0	50.2	53.5	46.0	51.6	53.0	48.0	52.7	55.0	50.5	53.2	55.0	50.5	52.8	54.5	50.0	59.3	62.3
11-May-23	9:15	67.8	55.2	51.5	50.3	53.5	48.5	52.6	55.5	50.0	49.9	53.5	47.5	52.2	55.0	50.0	51.7	53.5	49.5	60.5	63.5
17-May-23	9:23	77.0	79.6	52.5	64.2	68.4	50.1	58.5	62.8	50.7	55.9	59.5	50.0	54.6	58.0	47.3	55.0	57.2	47.8	69.6	72.6
23-May-23	10:00	65.3	55.5	48.0	62.2	53.0	47.5	51.8	52.5	50.0	54.0	55.5	51.5	52.6	53.0	50.5	53.7	55.0	50.0	59.9	62.9
29-May-23	10:11	67.3	70.0	60.8	62.4	63.7	56.8	60.6	63.4	54.7	59.8	62.4	58.3	65.2	69.9	59.8	59.4	61.8	53.6	63.5	66.5

Daytime Noise Measurement Results (dB) of N2a																					
Date	Start Time	1st Leq (5min)			2nd Leq (5min)			3rd Leq (5min)			4th Leq (5min)			5th Leq (5min)			6th Leq (5min)			Leq30min, dB(A)	Distance & Façade Correction
		Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)		
5-May-23	14:22	48.4	50.0	45.0	46.2	49.0	44.0	45.3	50.0	43.0	45.7	50.0	42.5	47.2	50.5	45.0	48.8	51.0	43.0	47.1	51.1
11-May-23	14:00	50.2	52.5	48.5	51.4	53.0	48.5	49.8	52.0	47.0	50.6	53.0	48.5	48.7	51.0	46.5	50.3	51.5	47.0	50.2	54.2
17-May-23	10:00	52.0	54.6	39.5	48.3	50.2	38.7	46.1	48.9	38.3	50.8	53.1	40.5	44.5	47.2	38.6	46.8	50.7	39.4	48.9	52.9
23-May-23	10:35	51.8	53.0	48.5	50.2	52.5	48.0	49.6	51.0	48.0	48.8	50.5	46.5	49.3	50.5	46.5	50.0	51.0	48.5	50.1	54.1
29-May-23	10:49	53.6	56.8	50.0	55.2	58.4	48.9	54.9	58.3	43.8	53.4	54.6	46.2	51.2	52.6	48.3	48.6	49.9	46.8	53.3	57.3

Daytime Noise Measurement Results (dB) of N3a																					
Date	Start Time	1st Leq (5min)			2nd Leq (5min)			3rd Leq (5min)			4th Leq (5min)			5th Leq (5min)			6th Leq (5min)			Leq30min, dB(A)	Distance & Façade Correction
		Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)		
5-May-23	13:00	66.8	56.0	53.0	55.2	59.5	52.0	53.7	58.0	50.0	55.6	60.0	49.5	56.9	63.0	50.5	57.8	63.0	52.0	60.5	66.5
11-May-23	10:20	71.8	62.5	53.0	56.6	58.5	53.0	57.2	58.5	52.5	55.9	57.5	50.0	56.4	58.0	50.5	57.2	59.5	51.0	64.6	70.6
17-May-23	14:20	74.7	76.6	50.1	63.5	67.0	52.4	65.9	68.4	53.5	60.2	64.0	51.6	58.3	62.1	52.3	58.9	63.0	52.7	68.0	74.0
23-May-23	9:20	67.7	58.5	50.5	52.6	55.0	50.5	53.4	55.0	51.5	53.6	55.5	49.5	51.8	53.0	49.5	52.7	53.5	50.0	60.6	66.6
29-May-23	11:26	69.4	70.8	61.9	63.7	64.6	59.9	53.6	56.0	50.8	60.9	62.8	60.0	61.4	64.2	58.1	58.9	62.0	48.3	63.9	69.9

Daytime Noise Measurement Results (dB) of N4																					
Date	Start Time	1st Leq (5min)			2nd Leq (5min)			3rd Leq (5min)			4th Leq (5min)			5th Leq (5min)			6th Leq (5min)			Leq30min, dB(A)	Distance & Façade Correction
		Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)		
5-May-23	15:03	68.7	59.5	44.0	47.2	49.5	43.5	48.8	50.0	44.5	46.3	50.5	43.5	50.2	53.5	44.0	48.6	50.0	43.5	61.1	64.1
11-May-23	13:17	69.2	58.0	53.5	49.7	52.0	47.5	50.3	53.5	48.0	48.6	50.5	46.5	49.5	51.0	47.5	51.0	52.0	48.5	61.7	64.7
17-May-23	13:25	67.4	70.3	48.4	57.8	59.5	44.6	47.6	50.8	45.3	52.0	54.8	43.8	50.7	53.9	46.3	56.8	58.2	45.9	60.6	63.6
23-May-23	11:14	70.2	58.5	49.0	48.4	53.0	46.0	46.2	48.0	44.5	45.3	48.0	44.0	50.5	52.5	44.5	48.6	50.0	45.0	62.6	65.6
29-May-23	9:32	62.7	66.8	57.3	63.2	65.4	57.0	61.6	63.8	56.2	68.5	73.0	60.2	64.3	67.7	59.3	61.4	64.2	58.1	64.4	67.4

Additional Noise Measurement Results during Restricted Hours (dB) of N1					
Date	Start Time	Leq (5min)			Distance & Façade Correction
		Leq, dB(A)	L10, dB(A)	L90, dB(A)	
4-May-23	19:05	55.2	57.3	42.7	58.2
7-May-23	9:56	42.1	44.5	38.5	45.1
9-May-23	19:15	56.3	58.5	42.6	59.3
14-May-23	11:13	45.2	46.0	43.0	48.2
15-May-23	19:27	42.5	44.1	37.5	45.5
21-May-23	10:22	46.7	48.5	43.5	49.7
24-May-23	19:10	53.0	55.8	45.0	56.0
28-May-23	10:08	50.2	53.0	48.0	53.2
31-May-23	19:10	54.6	56.0	44.7	57.6

Additional Noise Measurement Results during Restricted Hours (dB) of N2a					
Date	Start Time	Leq (5min)			Distance & Façade Correction
		Leq, dB(A)	L10, dB(A)	L90, dB(A)	
4-May-23	19:23	43.2	44.6	36.7	47.2
7-May-23	9:24	45.7	48.0	43.0	49.7
9-May-23	19:32	43.5	45.7	37.0	47.5
14-May-23	10:35	43.6	44.5	39.5	47.6
15-May-23	19:27	42.5	44.1	37.5	46.5
21-May-23	9:26	50.6	51.5	49.0	54.6
24-May-23	19:30	42.5	45.4	36.2	46.5
28-May-23	10:40	52.5	56.0	43.5	56.5
31-May-23	19:20	43.0	44.8	36.1	47.0

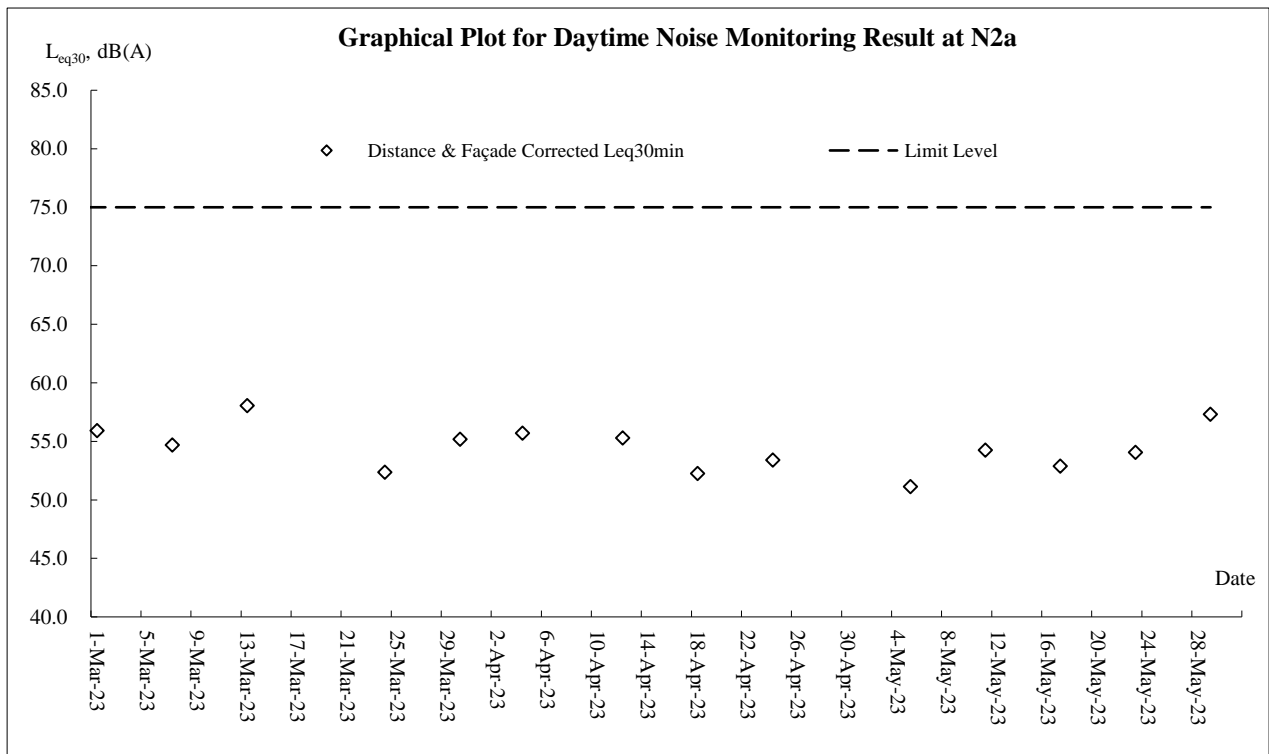
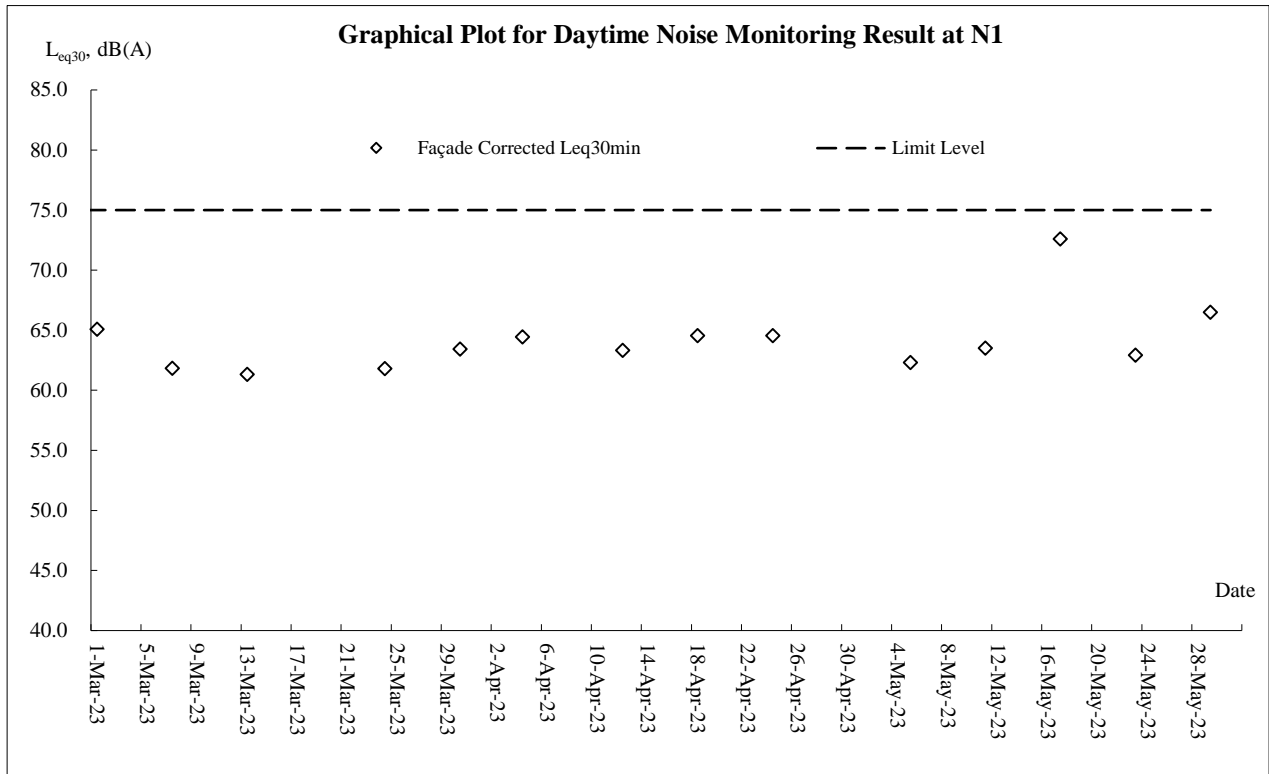
Additional Noise Measurement Results during Restricted Hours (dB) of N3a					
Date	Start Time	Leq (5min)			Distance & Façade Correction
		Leq, dB(A)	L10, dB(A)	L90, dB(A)	
4-May-23	20:30	45.6	47.1	39.8	51.6
7-May-23	11:07	47.7	50.0	43.5	53.7
9-May-23	20:35	51.6	53.9	45.7	57.6
14-May-23	9:31	49.8	50.0	44.0	55.8
15-May-23	20:42	49.2	51.7	46.6	55.2
21-May-23	11:08	50.3	51.5	44.0	56.3
24-May-23	20:35	52.8	55.0	46.3	58.8
28-May-23	9:36	51.2	52.0	49.0	57.2
31-May-23	20:30	50.6	54.3	44.0	56.6

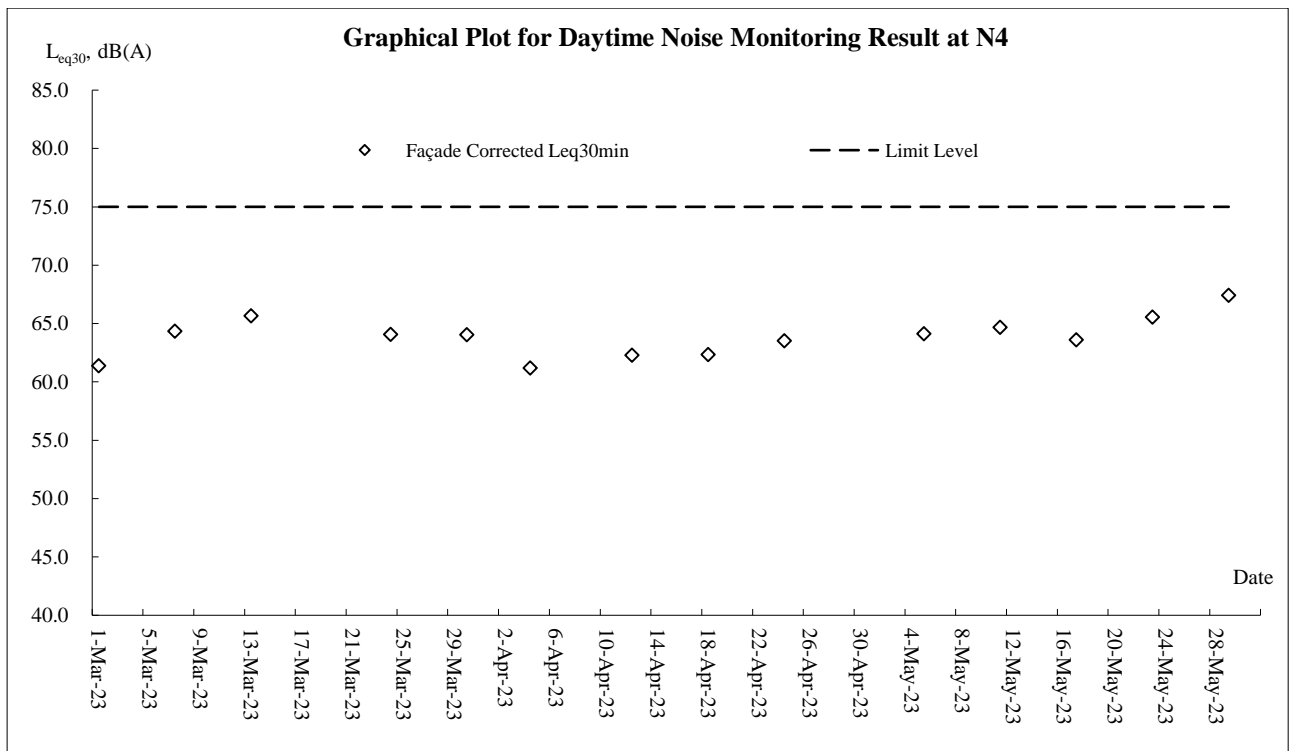
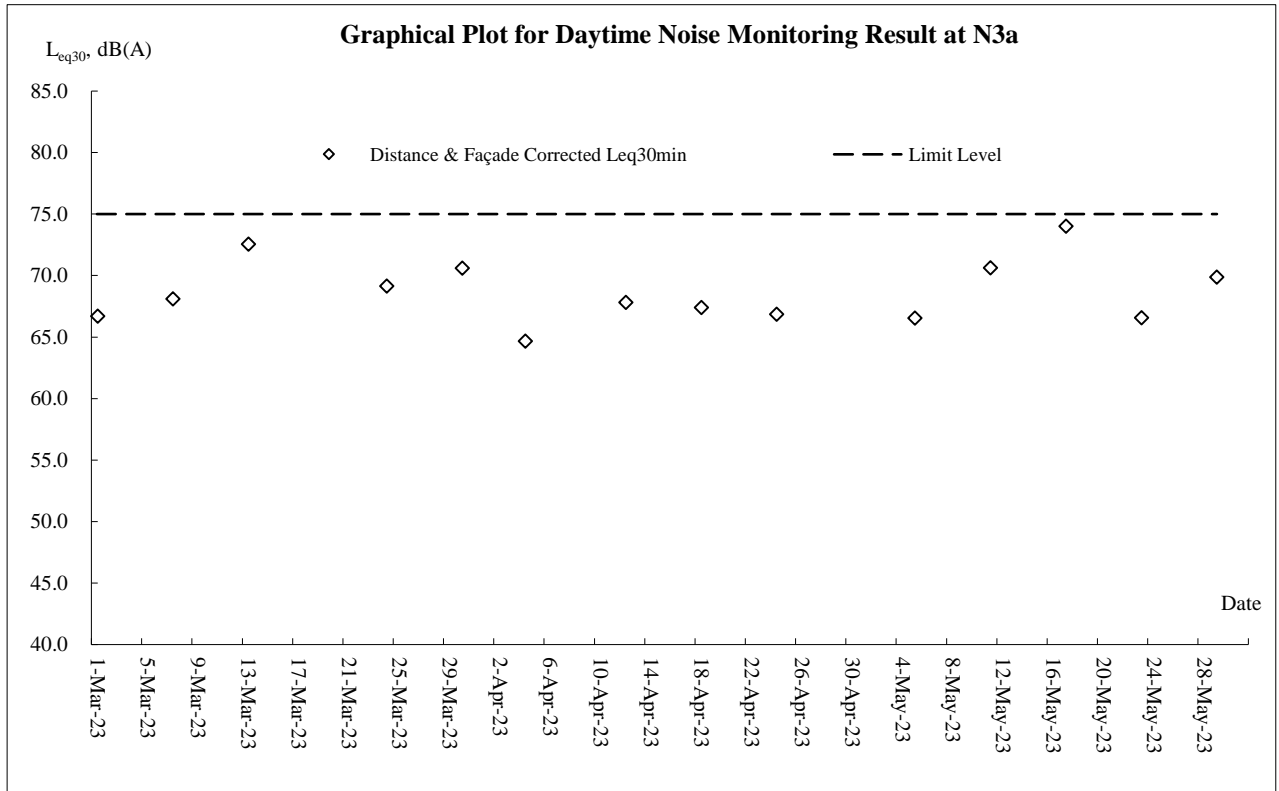
Additional Noise Measurement Results during Restricted Hours (dB) of N4					
Date	Start Time	Leq (5min)			Façade Correction
		Leq, dB(A)	L10, dB(A)	L90, dB(A)	
4-May-23	20:05	53.6	55.0	50.2	56.6
7-May-23	10:29	44.7	46.5	42.5	47.7
9-May-23	20:05	56.0	58.4	52.6	59.0
14-May-23	10:07	45.3	48.0	43.0	48.3
15-May-23	20:05	54.7	58.1	48.2	57.7
21-May-23	9:52	47.2	50.0	44.0	50.2
24-May-23	19:08	42.7	45.8	38.1	45.7
28-May-23	11:19	48.6	50.5	44.0	51.6
31-May-23	19:58	44.0	46.9	39.0	47.0

Appendix I

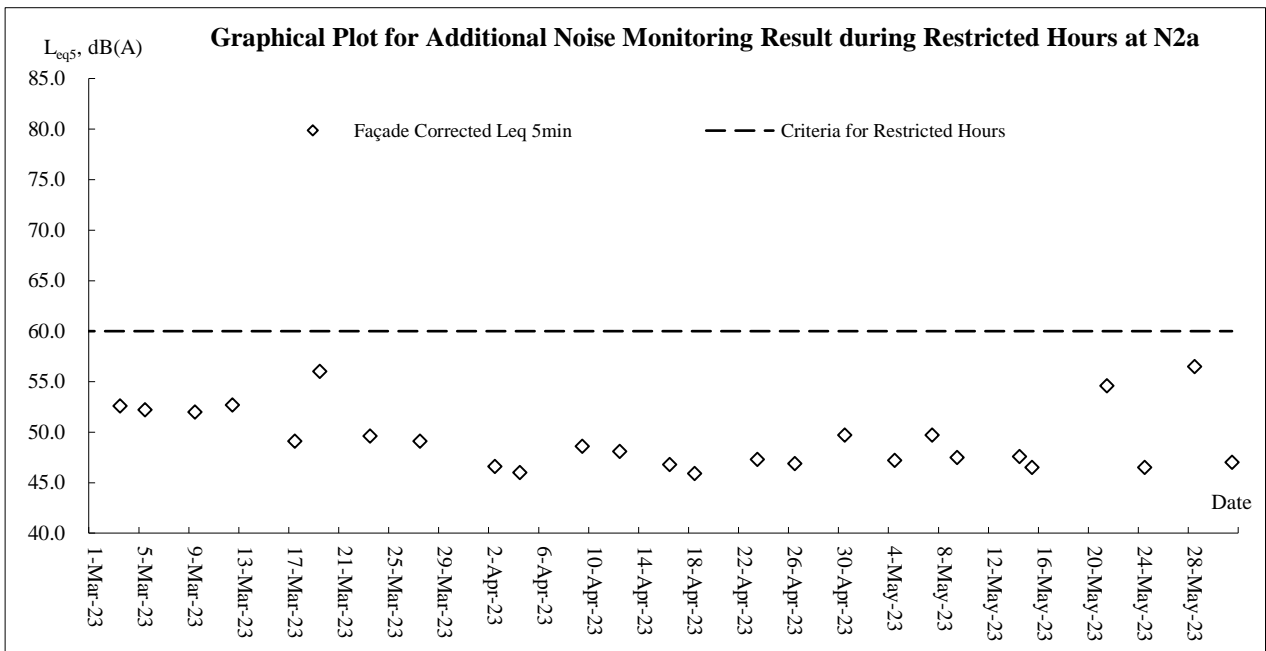
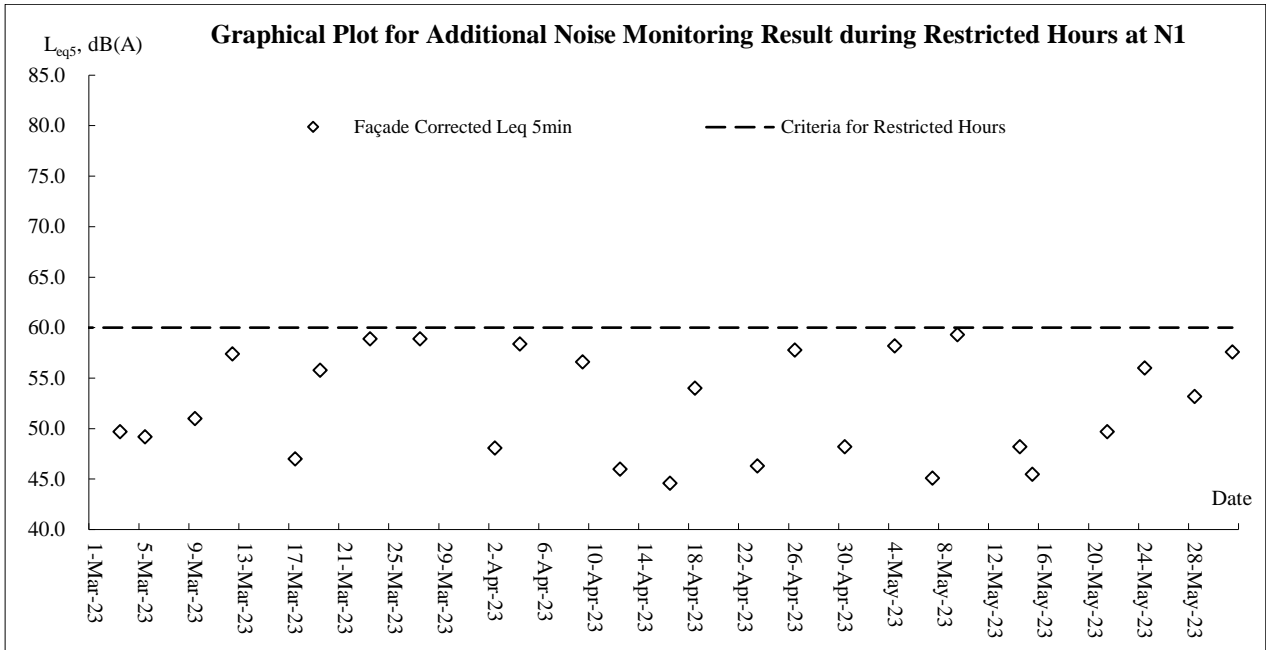
Graphical Plots of Monitoring Results

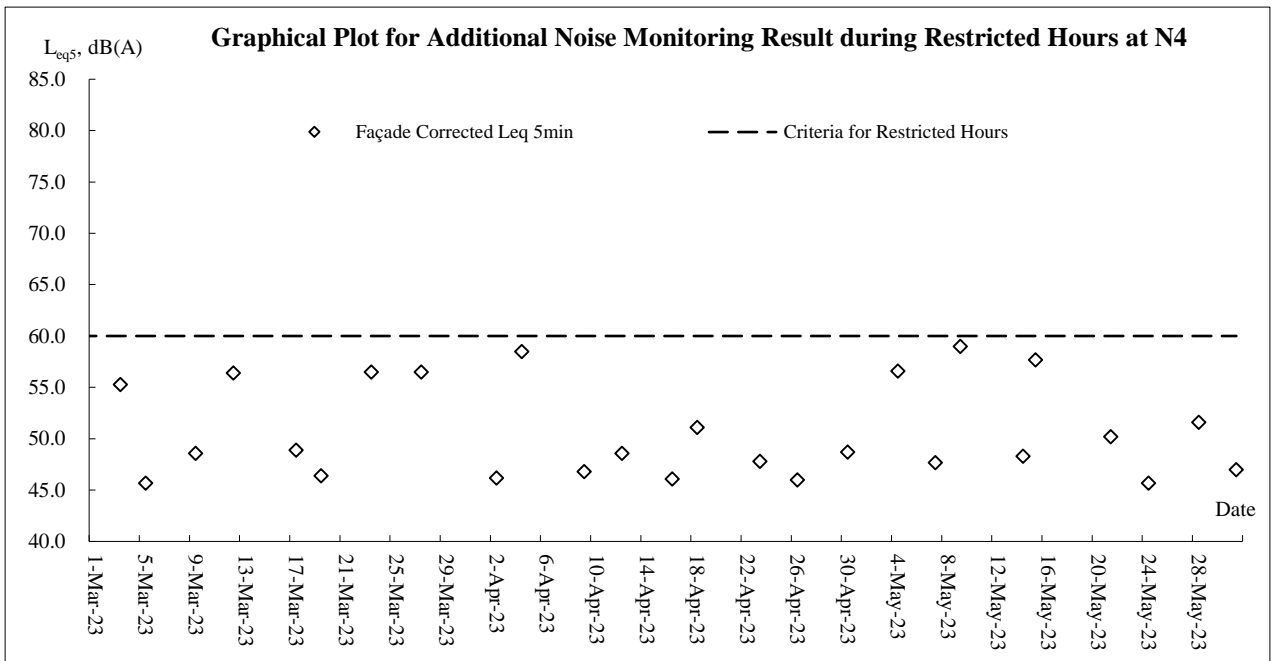
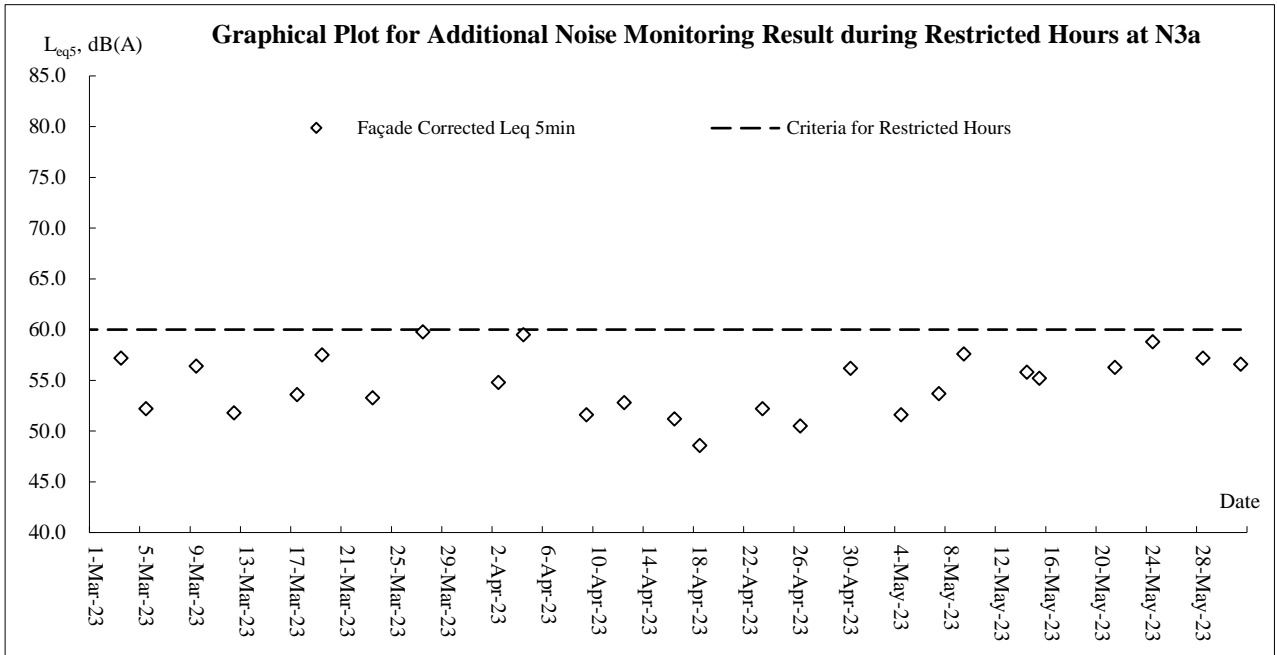
Construction Noise - Daytime





Construction Noise – Restricted Hours





Appendix J

Waste Flow Table

Monthly Summary Waste Flow Table for May 2023

Version: 0

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantity of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects (see Note 10)	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging (see Notes 4)	Plastics (see Notes 2 &4)	Chemical Waste	Others, eg. general refuse
	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m3)
sub-total up to 2022	98.401	0.000	0.000	83.508	14.660	0.233	337.486	1.250	0.700	0.000	3.497
Jan-23	0.314	0.000	0.000	0.000	0.314	0.000	0.000	0.000	0.000	0.000	0.136
Feb-23	0.932	0.000	0.000	0.000	0.932	0.000	0.000	0.000	0.000	0.000	0.059
Mar-23	0.644	0.000	0.000	0.000	0.644	0.000	0.000	0.000	0.000	0.000	0.131
Apr-23	0.633	0.000	0.000	0.000	0.633	0.000	0.000	0.000	0.000	0.000	0.103
May-23	0.779	0.000	0.000	0.000	0.779	0.000	0.000	0.000	0.000	0.000	0.104
Jun-23											
Sub total (since 2019)	101.703	0.000	0.000	83.508	17.962	0.233	337.486	1.250	0.700	0.000	4.030
Jul-23											
Aug-23											
Sep-23											
Oct-23											
Nov-23											
Dec-23											
Total (since 2019)	101.703	0.000	0.000	83.508	17.962	0.233	337.486	1.250	0.700	0.000	4.030

Note 1	The waste flow table shall also include C&D materials that are not specified in the Contract to be imported for use at the Site
2	Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material
3	The Contractor shall also submit the latest forecast of the amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000m ³ .
4	All recyclable materials, including metals, paper / cardboard packaging, plastics, etc. will be collected by registered collector for recycling.
5	Conversion factors for reporting purpose:
	in-situ: rock = 2.5 tonnes/m ³ ; soil = 2.0 tonnes/m ³
	excavated: rock = 2.0 tonnes/m ³ ; soil = 1.8 tonnes/m ³ ; broken concrete and bitumen = 2.4 tonnes/m ³
	C&D Waste (including tree waste) = 0.9 tonnes/m ³ ; bentonite slurry = 2.8 tonnes/m ³
6	Numbers are rounded off to the nearest three decimal places
7	The "Total Quantity Generated" equals to the sum of "Reuse in the Contract", "Reuse in Other Projects" and "Disposed as Public Fill"
8	The "Hard Rock and Large Broken Concrete" were disposed as public fill
9	The amount in "Disposed as Public Fill" includes the "Hard Rock and Large Broken Concrete" disposed as public fill
10	The "Reused in other projects" include C&D inert material and hard rock and large broken concrete

Appendix K

Environmental Mitigation Implementation Schedule (Extracted from EM&A Manual)

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
Air Quality Impact (Construction)									
3.8.1.1	2.4	<p>General Dust Control Measures</p> <p>Dust emissions could be suppressed by regular water spraying on site. In general, water spraying twice a day could reduce dust emission from active construction area by 50%. However, for the Project more frequent water spraying is proposed. Watering eight times per day, or once every 1.5 hours, is suggested at all active works areas in order to achieve a higher dust suppression efficiency of 87.5%.</p>	Within construction site / Duration of the construction phase	Contractor		✓			EIA Recommendation and Air Pollution Control (Construction Dust) Regulation
3.8.1.2	2.4	<p>Best Practice For Dust Control</p> <p>The relevant best practices for dust control as stipulated in the <i>Air Pollution Control (construction Dust) Regulation</i> should be adopted to further reduce the construction dust impacts of the Project. These best practices include:</p> <p><i>Good Site Management</i></p> <ul style="list-style-type: none"> ▪ Good site management is important to help reducing potential air quality impact down to an acceptable level. As a general guide, the Contractor should maintain a high standard of housekeeping to prevent emissions of fugitive dust. Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimise the release of visible dust emission. Any piles of materials accumulated on or around the work areas should be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimising generation of fugitive dust emissions. The material should be handled properly to prevent fugitive dust emission before cleaning. <p><i>Disturbed Parts of the Roads</i></p> <ul style="list-style-type: none"> ▪ Each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or ▪ Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road 	Within construction site / Duration of the construction phase	Contractor		✓			EIA Recommendation and Air Pollution Control (Construction Dust) Regulation

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		<p>surface wet.</p> <p><i>Exposed Earth</i></p> <ul style="list-style-type: none"> Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies. <p><i>Loading, Unloading or Transfer of Dusty Materials</i></p> <ul style="list-style-type: none"> All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet. <p><i>Debris Handling</i></p> <ul style="list-style-type: none"> Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides. Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped. <p><i>Transport of Dusty Materials</i></p> <ul style="list-style-type: none"> Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards. <p><i>Wheel washing</i></p> <ul style="list-style-type: none"> Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. <p><i>Use of vehicles</i></p> <ul style="list-style-type: none"> The speed of the trucks within the site should be controlled to about 10km/hour in order to reduce adverse dust impacts and secure the safe movement around the site. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely 							

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle. <i>Site hoarding</i> <ul style="list-style-type: none"> Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit. 							
Air Quality Impact (Operation)									
3.8.2	2.3	Odour patrol at site boundary of the Project	Site boundary / During operation stage (the need to continue the odour patrol after the end of the 2-year monitoring period would depend on the monitoring results and should be agreed with EPD)	OWTF Operator	✓		✓		EIAO-TM
3.8.2	2.4	Install gas cleaning equipment and stack on the CHP and odour treatment unit <ul style="list-style-type: none"> The preliminary design suggests the use of a two stage process involving either a biofilter or Ultraviolet Light (UV-C) together with ozone treatment as the first stage, and an activated carbon filter as the second stage for the odour treatment unit. It is recommended to install the UV-C and ozone treatment system with second stage active carbon filters as this has a lower footprint requirement than the biofilter option. However, the actual unit installed depends on the final design by the contractor in the design phase. The preliminary design incorporates a combination of thermal and catalytic treatment processes to remove pollutants from the exhaust gasses from the CHP. Both the odour treatment unit and the CHP emissions are suggested to be directed to a flue to aid the dispersion and minimise effects on ASRs. 	CHP and odour treatment unit	Design Consultant / OWTF Operator	✓		✓		EIA Recommendation
Hazard Risk Assessment (Operation)									

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
4.9	3.2	<p>The HA has assumed that the following “Good Practices” and “recommended design measures” for the safe operation of OWTF 2 shall be carried out as far as reasonably practicable:</p> <ul style="list-style-type: none"> ▪ The process plant building will be provided with adequate number of gas detectors distributed over the various areas of potential leak sources to provide adequate coverage. ▪ All electrical equipment inside the building will be classified in accordance with the electrical area classification requirements. No unclassified electrical equipment will be used during operations or maintenance. ▪ Reference can be made to Codes of Practice and guidance issued in Europe that applies to places where explosive atmospheres may occur (called ‘ATEX’ requirements). These are covered as part of the European Directive: the Explosive Atmospheres Directive (99/92/EC) and the UK regulations, Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR). Where potentially explosive atmospheres may occur in the workplace, the requirements include, identifying and classifying (zoning) areas where potentially explosive atmospheres may occur; avoiding ignition sources in zoned areas, in particular those from electrical and mechanical equipment; where necessary, identifying the entrances to zoned areas; providing appropriate anti-static clothing for employees; and before they come into operation, verifying the overall explosion protection safety of areas where explosive atmospheres may occur. ▪ All safety valves design shall take into account discharging any released fluid to a safe location, or stopping misdirection of fluid flows in order to avoid hazardous outcome. ▪ Safety markings and crash barriers will be provided to the aboveground piping, digesters and the gas holder near the entrance. ▪ Lightning protection installations will be installed following IEC 62305, BS EN 62305, AS/NZS 1768, NFPA 780 or equivalent standards. ▪ A 10m high boundary wall with fire resistance will be 	During design and operation phases	Design Consultant / OWTF Operator	✓		✓		EIAO & EIAO TM Annex 4

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		<p>provided in the vicinity of the digester tanks, gasholders and gas purification equipment to protect the equipment against external fires, and to provide some protection to external areas from the effects of fire/explosion.</p> <ul style="list-style-type: none"> ▪ Suitable fire extinguishers will be provided within the site. An External Water Spray System (EWSS) will be installed in appropriate areas, such as around the gasholders, gas purification, desulphurisation units, and digester areas. The facilities will also be equipped with fire and gas detection system and fire suppression system. Stringent procedures are implemented to prohibit smoking or naked flames to be used on-site. ▪ Fixed crash barriers will be provided in areas where process equipment is adjacent to the internal roadway to protect against vehicle collision. Adequate warning signage and lighting will also be provided and maximum speed limit will also be in place. 							
Noise Impact (Construction)									
5.9.1	4.2.7	<p>Good Site Practice Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during each phase of construction:</p> <ul style="list-style-type: none"> ▪ only well-maintained plant to be operated on-site and plant should be serviced regularly during the construction works; ▪ machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum; ▪ plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs; ▪ mobile plant should be sited as far away from NSRs as possible; and ▪ material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site 	Within construction site / During construction phase	Contractor		✓			EIAO, EIAO-TM and Noise Control Ordinance

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		construction activities.							
5.9.1	4.2.7	Selection of Quieter PME The recommended quieter PME adopted in the assessment were taken from the EPD's QPME Inventory and British Standard, namely <i>Noise Control on Construction and Open Sites, BS 5228: Part 1: 2009</i> . It should be noted that the silenced PME selected for assessment can be found in Hong Kong.	Within construction site / During construction phase	Contractor		✓			EIAO, EIAO-TM and Noise Control Ordinance
5.9.1	4.2.7	Use of Movable Noise Barriers Movable noise barriers can be very effective in screening noise from particular items of plant when constructing the Project. Noise barriers located along the active works area close to the noise generating component of a PME could produce at least 10 dB(A) screening for stationary plant and 5 dB(A) for mobile plant provided the direct line of sight between the PME and the NSRs is blocked.	Within construction site / During construction phase	Contractor		✓			EIAO, EIAO-TM and Noise Control Ordinance
5.9.1	4.2.7	Use of Noise Enclosure/ Acoustic Shed The use of noise enclosure or acoustic shed is to cover stationary PME such as air compressor and generator. With the adoption of the noise enclosure, the PME could be completely screened, and noise reduction of 15 dB(A) can be achieved according to the EIAO Guidance Note No.9/2010.	Within construction site / During construction phase	Contractor		✓			EIAO, EIAO-TM and Noise Control Ordinance
5.9.1	4.2.7	Use of Noise Insulating Fabric Noise insulating fabric can also be adopted for certain PME (e.g. pilling machine etc). The fabric should be lapped such that there are no openings or gaps on the joints. According to the approved Tsim Sha Tsui Station Northern Subway EIA report (AEIAR-127/2008), a noise reduction of 10 dB(A) can be achieved for the PME lapped with the noise insulating fabric.	Within construction site / During construction phase	Contractor		✓			EIAO, EIAO-TM and Noise Control Ordinance
Noise Impact (Operation)									
5.9.2	4.2.7	Fixed Plant Noise Specification of the maximum allowable sound power levels of the proposed fixed plants should be followed. The following noise reduction measures should be considered as far as practicable during operation: <ul style="list-style-type: none"> ▪ Choose quieter plant such as those which have been effectively silenced; 	Within construction site / During operation phase / Throughout operation phase	Design Consultant / Contractor	✓		✓		EIAO, EIAO-TM and Noise Control Ordinance

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		<ul style="list-style-type: none"> ▪ Include noise levels specification when ordering new plant (including chillier and E/M equipment); ▪ Locate fixed plant/louver away from any NSRs as far as practicable; ▪ Locate fixed plant in walled plant rooms or in specially designed enclosures; ▪ Locate noisy machines in a completely separate building; ▪ Install direct noise mitigation measures including silencers, acoustic louvers and acoustic enclosure where necessary; and ▪ Develop and implement a regularly scheduled plant maintenance programme so that equipment is properly operated and serviced in order to maintain a controlled level of noise. 							
Water Quality Impact (Construction)									
6.8.1.1	5.3	<p>Construction site runoff</p> <p>The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended to protect water quality and sensitive uses of the coastal area, and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impacts:</p> <ul style="list-style-type: none"> ▪ At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities. The design of the temporary on-site drainage system should be undertaken by the Contractor prior to the commencement of construction; ▪ Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt 	Within construction site / Duration of the construction phase	Contractor		✓			ProPECC Note PN 1/94

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		<p>removal facilities should be based on the guidelines in Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the Contractors prior to the commencement of construction.</p> <ul style="list-style-type: none"> ▪ 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 during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. ▪ Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities. ▪ All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exit where practicable. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. ▪ Open stockpiles of construction materials or construction wastes on-site 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. ▪ Manholes (including newly constructed ones) should be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and stormwater runoff being directed into 							

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		foul sewers. <ul style="list-style-type: none"> Precautions should be taken at any time of the year when rainstorms are likely. Actions should be taken when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC Note PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes. Bentonite slurries used in piling or slurry walling should be reconditioned and reused wherever practicable. Temporary enclosed storage locations should be provided on-site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries. 							
6.8.1.2	5.3	General construction activities Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby storm water drain. Stockpiles of cement and other construction materials should be kept covered when not being used.	Within construction site / During construction phase	Contractor		✓			ProPECC Note PN 1/94
6.8.1.3	5.3	Excavation works The construction programme should be properly planned to minimise excavation works during the wet season (April to September), temporarily exposed slope/soil surfaces should be covered by a tarpaulin or other means, as far as practicable. Interception channels should be provided (e.g. along the crest/edge of the excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements should be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. Other measures that need to be implemented before, during and after rainstorms are summarized in ProPECC PN 1/94.	Within construction site / During construction phase	Contractor		✓			ProPECC Note PN 1/94
6.8.1.4	5.3	Accidental spillage <ul style="list-style-type: none"> The Contractor should register as a chemical waste producer 	Within construction site / During construction phase	Contractor		✓			ProPECC Note PN 1/94 and Waste Disposal

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		<p>if chemical wastes are produced from construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.</p> <ul style="list-style-type: none"> ▪ Maintenance of vehicles and equipment, involving activities with potential for leakage and spillage, should only be undertaken within areas appropriately equipped to control these discharges. ▪ Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby storm water drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event. ▪ Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: <ul style="list-style-type: none"> – Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. – Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents. – Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area. 						Ordinance	
6.8.1.5	5.3	<p>Sewage effluent from construction workforce</p> <p>Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be</p>	<p>Within construction site / During construction phase</p>	Contractor		✓			ProPECC Note PN 1/94

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		responsible for appropriate disposal and maintenance.							
Water Quality Impact (Operation)									
6.8.2.1	5.3	<p>Sewage effluent and sewerage impact</p> <p>In order to minimise the risk of exceeding capacity of the sewerage system, on-site underground storage of effluent is recommended for the OWTF 2, with a capacity of 6 hours of peak flow. Using the values presented in the preliminary design, the on-site storage required to buffer excess capacity would be equivalent to 30 m³. A below ground effluent retention tank would function to store effluent produced during peak periods when usage of the Sha Ling pumping station is high. Effluent stored during such periods could then be pumped out of the retention tank and discharged into the public sewer during off-peak times when capacity is sufficient.</p>	Within construction site / During design and operation phase	Design Consultant / OWTF Operator	✓		✓		EIA recommendations
6.8.2.2	5.3	<p>Wastewater generation from organic waste treatment processes</p> <p>Wastewater must be collected and diverted to the wastewater treatment plant (WWTP).</p> <p>An adequately sized WWTP with technologies such as membrane bioreactor, reverse osmosis or multi-phase separation process or system should be provided for the OWTF 2. Polluting parameters in the effluent should be in compliance with the requirements as specified in the TM-DSS.</p> <p><i>Leachate from the waste reception and composting process</i></p> <ul style="list-style-type: none"> A drainage system will be provided at the reception area connecting to the proposed onsite WWTP. The leachate would be treated in the WWTP and there would be no direct discharge of leachate. <p><i>Dewatering of the digestate from the separators</i></p> <ul style="list-style-type: none"> The wastewater generated from the dewatering of digestate from the digesters is expected to be around 229.18 m³/day and a peak flow of 5.31L/s. The on-site WWTP will deploy suitable treatment process in order to reduce the pollution level to an acceptable standard. The effluent shall be treated according to the TM-DSS standard before discharging to foul sewers. 	Within construction site / During design and operation phase	Design Consultant / OWTF Operator	✓		✓		TM-DSS, Water Pollution Control Ordinance

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		<p><i>Condensate from biogas drying, odour treatment and ventilation system</i></p> <ul style="list-style-type: none"> Condensate from biogas handling and wastewater from the odour treatment process would be collected and transferred to the WWTP. There is no direct discharge of wastewater to the sewer. <p><i>Washing of waste delivery trucks</i></p> <ul style="list-style-type: none"> Surplus wastewater generated from the vehicle washing facilities would be collected and transferred to the WWTP for further treatment before discharging to the foul sewer. <p><i>Untreated wastewater from wastewater treatment plant</i></p> <ul style="list-style-type: none"> Maintenance of the WWTP and its connection pipe work would be conducted regularly to confirm the condition of the holding tank and pipes. This will ensure early detection of any damage for repair or replacement. <p><i>Leakage of materials from WWTP</i></p> <ul style="list-style-type: none"> Regular scheduled maintenance of the WWTP will be carried out to confirm the condition of the facility and detect any damages at an early stage for repair or replacement. 							
6.8.2.3	5.3	<p>Contaminated stormwater runoff and accidental spillages</p> <p>Regular maintenance of plant facilities, as recommended in Section 6.8.2.2 of the EIA report, will be performed to confirm the condition of plant facilities and detect any damage for repair or replacement. Training should be provided to the employees on handling accidental spillage, so that in such cases, actions can be carried out quickly to avoid runoff to nearby streams/drains.</p>	Within construction site / During operation phase / Throughout operation phase	OWTF Operator			✓		TM-DSS; Water Pollution Control Ordinance
Waste Management Implications (Construction)									
7.6.1.1	6.3	<p>Good Site Practices</p> <p>Recommendations for good site practices during the construction activities include:</p> <ul style="list-style-type: none"> Obtain the relevant waste disposal permits from appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354) and subsidiary Regulations and the Land (Miscellaneous Provisions) Ordinance (Cap. 28); 	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor			✓		Waste Disposal Ordinance; Regulation and the Land (Miscellaneous Provisions) Ordinance;

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		<ul style="list-style-type: none"> ■ Provide staff training for proper waste management and chemical handling procedures; ■ Provide sufficient waste disposal points and regular waste collection; ■ Provide appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; ■ Carry out regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; ■ Separate chemical wastes for special handling and disposal to licensed facilities for treatment; and ■ Employ licensed waste collectors to collect waste. 							Waste Disposal (Chemical Wastes) (General) Regulation; Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site
7.6.1.2	6.3	<p>Waste Reduction Measures</p> <p>Recommendations to achieve waste reduction include:</p> <ul style="list-style-type: none"> ■ Design foundation works to minimise the amount of excavated material to be generated; ■ Provide training on the importance of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycling; ■ Sort demolition debris and excavated materials from demolition works to recover reusable/recyclable portions ■ Segregation and storage of different types of waste in different containers or skips to enhance reuse or recycling of materials and their proper disposal ■ Encourage collection of recyclable waste such as waste paper and aluminium cans by providing separate labelled bins to enable such waste to be segregated from other general refuse generated by the work force ■ Plan the use of construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste 	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor	✓	✓			Waste Disposal Ordinance
7.6.1.3	6.3	<p>Excavated and C&D Materials</p> <p>In order to minimise impacts resulting from collection and transportation of C&D material for off-site disposal, the</p>	Project construction site / Throughout construction stage / Until completion	Contractor	✓	✓			Waste Disposal Ordinance ; DEVB Technical

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		<p>excavated materials should be reused on-site as fill material as backfilling material and for landscaping works far as practicable. Other mitigation requirements are:</p> <ul style="list-style-type: none"> ▪ A Waste Management Plan (WMP), which becomes part of the Environmental Management Plan (EMP), should be prepared in accordance with ETWB TC(W) No.19/2005; ▪ A recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites) should be adopted for easy tracking; and ▪ In order to monitor the disposal of excavated and non-inert C&D material at public filling facilities and landfills and to control fly-tipping, a trip-ticket system should be adopted (refer to DEVB TC(W) No. 6/2010). 	of all construction activities					<p>Circular (Works) No.6/2010 for Trip Ticket System for Disposal of Construction & Demolition Materials;</p> <p>Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site</p>	
7.6.1.4	6.3	<p>Chemical Waste</p> <p>Should chemical wastes be produced at the construction site, the Contractor would be required to register with EPD as a Chemical Waste Producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste (such as explosive, flammable, oxidizing, irritant, toxic, harmful, or corrosive). The Contractor should employ a licensed collector to transport and dispose of the chemical wastes, to either the CWTC in Tsing Yi, or any other licensed facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</p>	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor		✓			<p>Code of Practice on the Packaging Labelling and Storage of Chemical Wastes;</p> <p>Waste Disposal (Chemical Waste) (General) Regulation</p>
7.6.1.5	6.3	<p>General Refuse</p> <p>General refuse should be stored in enclosed bins or compaction units separated from excavated and non-inert C&D materials. A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from inert C&D materials. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.</p>	Project construction site / Throughout construction stage / Until completion of all construction activities	Contractor		✓			<p>Waste Disposal Ordinance and Public Health and Municipal Services Ordinance - Public Cleansing and Prevention of Nuisances</p>

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
Waste Management Implications (Operation)									
7.6.2.1	6.3	<p>Good site practices</p> <p>Adoption of the following good operational practices should be recommended to minimise waste management impacts:</p> <ul style="list-style-type: none"> ▪ Obtain the necessary waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Chemical Waste) (General) Regulation and the Land (Miscellaneous Provision) Ordinance (Cap. 28); ▪ Nomination of an approved person to be responsible for good site practice, arrangements for collection and effective disposal to an appropriate facility of all wastes generated at the site; ▪ Use of a waste haulier licensed to collect specific category of waste; ▪ A trip-ticket system should be included as one of the contractual requirements and implemented by the Environmental Team to monitor the disposal of solid wastes at public filling facilities and landfills, and to control fly tipping. Reference should be made to DEVB TC(W) No. 6/2010. ▪ Training of site personnel in proper waste management and chemical waste handling procedures; ▪ Separation of chemical wastes for special handling and appropriate treatment at a licensed facility; ▪ Routine cleaning and maintenance programme for drainage systems, sumps and oil interceptors; ▪ Provision of sufficient waste disposal points and regular collection for disposal; ▪ Adoption of appropriate measures to minimise windblown litter and dust during transportation of waste, such as covering trucks or transporting wastes in enclosed containers; and, ▪ Implementation of a recording system for the amount of 	Construction site / On a regular basis / Throughout operation stage	OWTF Operator			✓		Regulation Waste Disposal Ordinance; Waste Disposal (Chemical Waste) (General); Regulation and the Land (Miscellaneous Provision) Ordinance; DEVB Technical Circular (Works) No. 6/2010.

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		wastes generated, recycled and disposed of (including the disposal sites).							
7.6.2.2	6.3	<p>Waste reduction measures</p> <p>Adoption of the following good operational practices should be recommended to ensure waste reduction:</p> <ul style="list-style-type: none"> ▪ Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; ▪ Encourage collection of aluminium cans, plastic bottles and packaging material (e.g. carton boxes) and office paper by individual collectors. Separate labelled bins should be provided to help segregate this waste from other general refuse generated by the work force; and ▪ Any unused chemicals or those with remaining functional capacity should be reused as far as practicable. 	Construction site / On a regular basis / Throughout operation stage	OWTF Operator			✓		Waste Disposal Ordinance; Waste Disposal (Chemical Waste) (General); Regulation and the Land (Miscellaneous Provision) Ordinance
7.6.2.3	6.3	<p>Waste generated from pre-treatment process</p> <p>Wastes generated from pre-treatment process should be recycled as far as possible. Wastes generated from pre-treatment process should also be separated from any chemical waste and stored in covered skips. The recyclables should be collected by licensed collectors, while the rest of the waste should be removed from the site on a daily basis to minimise odour, pest and litter impacts. Open burning must be strictly prohibited.</p>	Pre-treatment process / Throughout operation stage	OWTF Operator			✓		Waste Disposal (Chemical Waste) (General)
7.6.2.4	6.3	<p>Chemical Waste</p> <ul style="list-style-type: none"> ▪ Chemical waste generated from machinery maintenance and servicing should be managed in accordance with the Code of Practice on the Packaging, Labelling and storage of Chemical Wastes under the provisions of Waste Disposal (Chemical Waste) (General) Regulation. The chemical waste should be collected by drum-type containers and, when transported off-site, removed by licensed chemical waste contractors. Alternatively, some of the chemical waste may be retained on-site for re-use by the Project in the manufacture of biogas or other products, subject to their composition being confirmed as suitable for such application. 	Construction site Throughout operation stage	OWTF Operator			✓		Code of Practice on the Packaging Labelling and Storage of Chemical Wastes; Waste Disposal (Chemical Waste) (General) Regulation

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		<ul style="list-style-type: none"> Plant / equipment maintenance schedules should be planned in order to minimise the generation of chemical waste. Non-recyclable chemical wastes and lubricants should be disposed of at appropriate facilities, such as CWTC. Copies or counterfoils from collection receipts issued by the licensed waste collector should be kept for recording purpose. Recyclable chemical waste will be transported off-site for treatment by a licensed collector. The Contractor will need to register with EPD as a chemical waste producer. 							
7.6.2.5	6.3	<p>General Refuse</p> <ul style="list-style-type: none"> Waste generated in site offices should be reduced through segregation and collection of recyclables. To promote the recycling of wastes such as used paper, aluminium cans and plastic bottles, it is recommended that recycling bins should be clearly labelled and placed at locations with easy access. For the collection of recyclable materials, they should be collected by licensed collectors. General refuse, other than segregated recyclable wastes, should be separated from any chemical waste and stored in covered skips. The general refuse should be removed from the site on a daily basis to minimise odour, pest and litter impacts. Also, open burning of refuse must be strictly prohibited. 	Construction site / On a regular basis / Throughout operation stage	OWTF Operator		✓			Waste Disposal Ordinance
Ecological Impact (Construction)									
8.7	7.3	For precautionary purposes and to further ensure that no wild flora species of conservation interest will be affected, prior to commencement of any construction works, it is recommended to conduct a detailed vegetation survey as baseline monitoring to update the exact locations, number and condition of individuals of <i>Aquilaria sinensis</i> and any other floral species of conservation interest within the Project Area. A Vegetation Survey Report summarizing the findings and recommendations of the detailed vegetation survey should be prepared and submitted to AFCD for approval no later than one month prior to commencement of construction works.	Before Project commencement	OWTF Operator	✓				EIAO-TM
8.7	7.3	During construction phase, erection of a temporary protective	Throughout construction	OWTF Operator		✓			EIAO-TM

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		fence along the plantation area where trees and vegetation, including those of conservation concern identified under the detailed vegetation survey, would be retained within the Project Area is recommended for precautionary purposes to avoid any potential impact from construction activities such as vehicle movement and materials storage. Establishment of the protective fence could also raise the awareness of personnel to be present and protection of the plants. While the protective fence should be properly maintained, monitoring of individuals of <i>Aquilaria sinensis</i> and any other floral species of conservation interest identified in the detailed vegetation survey during construction phase on a monthly basis should be conducted to make sure that they are not affected by the construction works of the Project.	stage						
Ecological Impact (Operation)									
No mitigation measure is required.									
Landscape and Visual Impact (Construction)									
Table 10.7 (CP1)	Table 8.1 (CP1)	Preservation of Existing Vegetation The development proposals would avoid disturbance to the existing trees as far as practicable within the confines of the development site. A preliminary tree survey has been undertaken to establish the existing resources. A tree survey review with formal tree removal application will be submitted to the relevant government departments for approval in accordance with ETWB TC(W) 03/2006 Tree Preservation, during the detailed design phase of the Project. Based on the preliminary findings it would be possible to retain 441 of the existing trees. If possible, all trees which are not in conflict with the proposals would be retained and shall be protected through the means of fencing, where appropriate, to prevent potential damage to tree canopies and root zones from vehicles and materials storage. Specifications for the protection of existing trees will be circulated to the relevant government authorities for approval together with the formal tree removal application.	Construction site / Throughout construction stage / Until completion of all construction activities	Contractor	✓	✓			Technical Circular (Works) No. 3/2006
Table 10.7 (CP2)	Table 8.1 (CP2)	Control of site construction activities <ul style="list-style-type: none"> ■ Storage of materials should be carefully arranged to minimise potential landscape and visual impact. 	Construction site / Throughout construction stage / Until completion	Contractor	✓	✓			EIAO-TM

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		<ul style="list-style-type: none"> The location and appearance of site accommodation should be carefully designed to minimise potential landscape and visual impact. Site lighting should be carefully designed to prevent light spillage, Extent of the works area and construction period should be minimised as far as practicable. Screen hoarding with compatible design to blend into the surrounding natural environment should be considered. Temporary works areas should be reinstated at the earliest possible opportunity. 	of all construction activities						
Table 10.7 (CP3)	Table 8.1 (CP3)	<p>Transplantation of existing trees</p> <p>Under current proposal, no tree is recommended to be transplanted since the trees in conflict with the proposed works are not suitable to be transplanted. However, should transplantation be proposed in the detailed design stage after an update tree survey, the recommended final recipient sites should be adjacent to their current locations. Enough time should be reserved for tree transplantation works to increase the survival rate of the transplanting trees. To ensure the survival of transplanted trees, protection work should be considered. The tree transplantation proposal will be submitted to relevant authorities for approval together with the formal tree removal application.</p>	Construction site / Throughout construction stage / Until completion of all construction activities	Contractor	✓	✓			Technical Circular (Works) No. 3/2006
Landscape and Visual Impact (Operation)									
Table 10.8 (OP1)	Table 8.2 (OP1)	<p>Design of the Proposed OWTF</p> <p>OWTF will incorporate design features as part of design mitigation measures including</p> <ul style="list-style-type: none"> Integrated design approach - the location of OWTF should be within the existing Livestock Waste Composting Plant, as far as technically feasible. The location and orientation of the OWTF should be away from landscape and visually sensitive areas such as ponds and woodlands. Building massing – the proposed use of simple responsive design includes having specific height profile requirement 	Construction site / During design stage	Design Consultant / OWTF Operator	✓				EIAO-TM

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		<p>such as, single-storey, lower than the adjacent building structures, and avoiding large built structure for supporting facilities to reduce the intrusion of mass in the rural areas.</p> <ul style="list-style-type: none"> ▪ Treatment of built structures – the structural design should seek to reduce the apparent visual mass of the facilities further through the use of natural materials such as wooden frames or other sustainable materials such as recycled plastics. ▪ Responsive building finishes – Natural tones should be considered for the colour palette for proposed structures. Non-reflective finishes are recommended on the outward facing building facades to reduce glare effect. ▪ Responsive lighting design – Aesthetic design of architectural and lighting with following glare design measures: <ul style="list-style-type: none"> – Directional and full cut off lighting is recommended within the boundaries of OWTF to minimise light spillage to the surroundings; – Minimise geographical spread of lighting, only applying for safety at the key access points and staircases; and <p>Limited lighting intensity to meet the minimum safety and operation requirement.</p>							
Table 10.8 (OP2)	Table 8.2 (OP2)	<p>Amenity / Compensatory Planting</p> <p>Tree retention within the works area is considered to be important. New tree plantings will be concentrated in the proposed amenity areas along the boundaries of the site and along the exterior of OWTF buildings. Although a preliminary planting proposal is not yet available at the moment of producing this EIA Report, anticipated new tree planting within the Project site should be able to fully compensate for the loss of 14 trees proposed to be felled in terms of both quantity and quality. 441 existing trees will be retained through preserving them at their current locations. Establishment of newly planted trees is expected. Trees with high amenity value will be placed along the access routes to provide shade and soften the hard structures of OWTF buildings. Amenity plantings will utilise native tree species found on existing neighbouring slopes or</p>	Construction site / during design and operation stage	Design Consultant / OWTF Operator	✓		✓		Technical Circular (Works) Nos. 7/2002 and 3/2006

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage ¹				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		woodland areas to improve the ecological connectivity between existing habitats and create a coherent landscape network. Tree species with aggressive roots should be avoided to prevent damage to OWTF buildings and structures. Trees with high or moderate amenity value and low to medium maintenance should be considered as part of landscape resource enhancement. Recommended tree species include <i>Celtis sinensis</i> and <i>Liquidambar formosana</i> . These proposals will be subjected to review at detail design stage of the Project.							
Table 10.8 (OP3)	Table 8.2 (OP3)	Treatment of Slopes In accordance with GEO Publication No. 1/2011 “Technical Guidelines on Landscape Treatment for Slopes”, these engineering structures will be aesthetically enhanced through the use of soft landscape works including tree and shrub planting to give man-made slopes a natural appearance, blending into the natural landscape. Whip-sized plantings are preferred on the face of soil cut slopes, at the crest and toe of the slope and within berm planters. These smaller, younger plants can adapt to their new growing conditions quicker than larger sized stock and establish a naturalistic effect rapidly. Recommended tree species include <i>Mallotus paniculatus</i> , <i>Broussonetia papyrifera</i> and <i>Alangium chinense</i> .	Construction site / during design and operation stage	Design Consultant / OWTF Operator	✓		✓		GEO Publication No. 1/2011 “Technical Guidelines on Landscape Treatment for Slopes
Table 10.8 (OP4)	Table 8.2 (OP4)	Amenity enhancement Rooftop greening and vertical greening to mitigate the visual impact of taller structures can soften the façade of OWTF structures. Frameworks utilised for vertical greening should appear naturalistic.	Construction site / during design and operation stage	Design Consultant / OWTF Operator	✓		✓		Technical Circular (Works) No. 7/2002

Remarks:

1. Des – Design Stage, C – Construction Stage, O – Operation, Dec - Decommissioning