





Contract No. 21/WSD/21

**Relocation of Diamond Hill Fresh Water and
Salt Water Service Reservoirs to Caverns**

**Monthly Environmental and Audit Report
August 2023**

ASCL	/	230168321	/	MRPT05	/	2.0
Publisher		Project Code		Sequential No.		Version

	Prepared by:	Certified by:
Name	Angel Lee	F. C. Tsang
Position	Environmental Team Consultant	Environmental Team Leader
Signature		
Date	12 September 2023	12 September 2023

Content

EXECUTIVE SUMMARY	1
1. INTRODUCTION.....	4
1.1 Project Background	4
1.2 Construction Works Programme	5
1.3 Project Organization.....	5
1.4 License, Notification and Permits	6
1.5 Brief Summary of EM&A Requirements.....	8
2. AIR QUALITY MONITORING.....	10
2.1 Monitoring Locations	10
2.2 Air Quality Monitoring Parameter, Frequency and Duration	10
2.3 Monitoring Equipment and Methodology and QA/ QC Procedure	10
2.4 Action and Limit Levels	11
2.5 Results and Observation	12
3. NOISE MONITORING	13
3.1 Monitoring Locations	13
3.2 Noise Monitoring Parameter, Frequency and Duration.....	13
3.3 Monitoring Equipment, Methodology and QA / QC Procedure.....	14
3.4 Maintenance and Calibration.....	15
3.5 Action and Limit Levels	15
3.6 Results and Observations	16
4. WASTE MANAGEMENT	17
5. ENVIRONMENTAL SITE INSPECTION AND AUDIT.....	18
6. ENVIRONMENTAL NON-COMPLIANCE.....	20
6.1 Summary of Exceedance	20
6.2 Summary of Environmental Non-Compliance	21
6.3 Summary of Environmental Complaint.....	21
6.4 Summary of Environmental Summon and Successful Prosecution.....	21
7. FUTURE KEY ISSUE	22
7.1 Construction Works and Potential Environmental Issues in the next Reporting Period.....	22

7.2 Recommendation..... 22

8. CONCLUSION, COMMENTS AND RECOMMENDATION 24

8.1 Conclusion..... 24

8.2 Comments and Recommendations 24

List of Tables

Table I	Summary of EM&A Activities in the Reporting Period
Table II	Summary of Exceedance in the Reporting Period
Table 1.1	Status of Environmental License, Notification and Permits
Table 1.2	Summary of Status of Submission under EP-602/2021
Table 2.1	Air Quality Monitoring Stations for Construction Phase
Table 2.2	Impact Air Quality Monitoring Parameter, Duration and Frequency
Table 2.3	Impact Air Quality Monitoring Equipment
Table 2.4	Action and Limit Levels for 1-hour TSP
Table 2.5	Summary of Impact 1-hour TSP Monitoring Results
Table 2.6	Influencing Factors at / near Air Quality Monitoring Stations
Table 3.1	Noise Monitoring Stations during Construction Phase
Table 3.2	Construction Noise Monitoring Parameter, Frequency and Duration
Table 3.3	Construction Noise Monitoring Equipment
Table 3.4	Action and Limit Levels for Construction Noise Monitoring
Table 3.5	Summary of Construction Noise Monitoring Results
Table 3.6	Influencing Factors at Noise Monitoring Stations
Table 4.1	Summary of Waste Generated in the Reporting Period
Table 5.1	Summary of Site Inspections Observations and Recommendations
Table 6.1	Summary of Event and Action Plans

List of Figure

Figure 1.1	Project Layout Plan
Figure 2.1	Air Quality Monitoring Stations
Figure 3.1	Construction Noise Monitoring Stations

List of Appendices

Appendix A	Master Construction Programme for the Project
Appendix B	Project Organization Chart and Key Personnel Contact
Appendix C	Event and Action Plans
Appendix D	Project Implementation Schedule
Appendix E	Air Quality and Noise Monitoring Equipment Calibration Certification
Appendix F	Environmental Monitoring Schedule
Appendix G	Air Quality Monitoring Results and Graphical Presentation
Appendix H	Extract of Meteorological Observations for Hong Kong (Kai Tak)
Appendix I	Noise Monitoring Results and Graphical Presentation
Appendix J	Waste Generation in the Reporting Month
Appendix K	Summary of Complaint, Notification of Summons and Prosecution and Cumulative Complaint Log
Appendix L	Incident Report(s) for Construction Noise Monitoring Exceedance

EXECUTIVE SUMMARY

This is the 5th Monthly Environment Monitoring and Audit (EM&A) Report for Relocation of Diamond Hill Fresh Water and Salt Water Service Reservoirs to Caverns (the Project). This report was prepared by Acuity Sustainability Consulting Limited under Contract No. 21/WSD/21 (hereafter called “the Contract”). This report documents the findings of EM&A works during the reporting period from 1 August to 31 August 2023.

Key Construction Works in the Reporting Period

A summary of construction activities undertaken during the reporting period is presented below:

- Jacking pit construction for pipe jacking;
- Trial pit excavation;
- Formation of piling platform at +89.0mPD;
- Pipe piling for PAB ELS wall;
- Site compound set up;
- ELS works in Portion 3; and
- Canopy table installation in portion 3.

Environmental Monitoring and Audit Programme

The monthly EM&A programme was undertaken by the Environmental Team in accordance with the EM&A Manual. A summary of the monitoring and audit activities during the reporting period is presented below:

Table I Summary of EM&A Activities in the Reporting Period

EM&A Activities	Date
1-hour TSP Monitoring	3, 9, 15, 21 and 26 August 2023
Construction Noise Monitoring	3, 9, 15, 21 and 26 August 2023
Weekly Environmental Site Inspection	3, 11, 15, 25 and 31 August 2023

Breaches of Action and Limit Levels

A summary of the environmental monitoring exceedance of the reporting period is tabulated in **Table II**.

Table II Summary of Exceedance in the Reporting Period

Environmental Monitoring	Parameter	No. of non-project related exceedances		Total no. of non-project related exceedances	No. of exceedances related to the project		Total no. of exceedances related to the project
		AL	LL		AL	LL	
Air Quality	1-hour TSP	0	0	0	0	0	0
Noise	$L_{eq(30-min)}$	0	1	1	0	0	0

Note:

1. AL refers to Action Level and LL refers to Limit Level.

Air Quality

No exceedance of action level or limit level was recorded for 1-hour TSP monitoring during the reporting period.

Construction Noise

No action level exceedance was recorded for construction noise monitoring during the reporting period.

One limit level exceedance was recorded on 3 August 2023 for construction noise monitoring during the reporting period. After investigation, the exceedance is considered as non-project related.

Complaint Log

No environmental complaint was received in the reporting period.

Notification of Summons and Successful Prosecutions

No notification of summons or successful prosecutions was received in the reporting period.

Reporting Change

There was no reporting change in the reporting period.

Future Key Issues

Key issues to be considered in the next two months included:

- Jacking pit construction for pipe jacking;
- Trial pit excavation;
- Formation of piling platform at +89.0mPD;
- Pipe piling for PAB ELS wall;

- Site compound set up; and
- ELS works in Portion 3.

Potential environmental impacts arising from the above construction activities are mainly associated with construction dust, construction noise, water pollution control, waste management and landscape and visual.

1. INTRODUCTION

1.1 Project Background

- 1.1.1 The relocated Diamond Hill Fresh Water and Salt Water Service Reservoirs (DHSRs) will be constructed in a series of caverns linked by access tunnels and adits. The relocated Diamond Hill Fresh Water Service Reservoirs (DHFWSR) and Diamond Hill Salt Water Service Reservoirs (DHSWSR) will be compartmented while the existing Diamond Hill Pumping Station (DHPS) will be split into two (2) pump houses for fresh and salt water supply when relocated.
- 1.1.2 Ancillary facilities to be constructed near the tunnel portal may include transformer room, switch room, emergency generator room, control room, ventilation building, and pumping station control room, which will be constructed in an above-ground building outside the tunnel.
- 1.1.3 The scope of the Project comprises the following:
- a) Construction of the relocated DHSRs and associated pumping stations and water main laying works;
 - b) Construction of tunnels, adits, ventilation system and caverns for accommodating the relocated DHSRs and the associated facilities;
 - c) Terminating the operation of the existing DHSRs and the associated facilities; and
 - d) All other associated works that are incidental to and necessary for the completion of the Project.
- 1.1.4 The major construction activities of the Project include earthworks, drilling and blasting, construction of concrete structures, handling and transportation of excavated materials, water mains laying, installation of electrical and mechanical (E&M) equipment and material transportation. The operation of the existing DHSRs and the associated facilities will be terminated after the completion of the testing and commissioning of the relocated DHSRs. Under the Project, the existing DHSRs and associated facilities will be retained after termination of the operation. The subsequent demolition works will be carried out by other government departments/ project proponents.
- 1.1.5 The Project construction was commenced on 31 March 2023 and the completion date for the construction works would be on 12 April 2027.
- 1.1.6 The Project is a Designated Project under Item Q.2, Part I of Schedule 2 of the Environmental Impact Assessment Ordinance, "Underground Rock Caverns", which requires an environmental permit from Environmental Protection Department for its construction and operation.
- 1.1.7 Pursuant to the Environmental Impact Assessment Ordinance (EIAO), the Director of Environmental Protection Department (EPD) granted the Environmental Permits (EP-602/2021) to the Water Supplies Department (WSD) for the Project.

1.1.8 Acuity Sustainability Consulting Limited (ASCL) is commissioned by Chun Wo – Sinohydro Joint Venture to undertake the role of Environmental Team under the Environmental Permit (EP) EP-602/2021, and to carry out the EM&A programme in fulfilment of the EM&A Manual, and other requirements stipulated in the associated EIA Report.

1.1.9 This is the 5th Monthly EM&A Report summarizing the key findings of the construction phase EM&A programme from 1 August to 31 August 2023 (the reporting period) and is submitted to fulfil the requirements in Conditions 3.4 of EP-602/2021 and section 13.3 of the EM&A Manual of the Project.

1.2 Construction Works Programme

1.2.1 The construction works of the Project was commenced on 31 March 2023. The construction works programme, and the location of construction works of the Project are shown in **Appendix A** and **Figure 1.1**, respectively. A summary of construction activities undertaken during the reporting period is presented below:

- Jacking pit construction for pipe jacking;
- Trial pit excavation;
- Formation of piling platform at +89.0mPD;
- Pipe piling for PAB ELS wall;
- Site compound set up;
- ELS works in Portion 3; and
- Canopy table installation in portion 3.

1.3 Project Organization

1.3.1 Different parties with different levels of involvement in the Project organization include:

- Project Proponent: Water Supplies Department (WSD)
- Supervisor/Engineer's Representative (ER): Binnies Hong Kong Limited
- Contractor: Chun Wo - Sinohydro Joint Venture
- Environmental Team (ET): Acuity Sustainability Consulting Limited
- Independent Environmental Checker (IEC): Umwelt Consulting Limited

1.3.2 The key personnel contact names and telephone number are presented in **Appendix B**.

1.4 License, Notification and Permits

1.4.1 A summary of the relevant permit, licences, and/ or notifications on environmental protection for this Project are presented in **Table 1.1**.

Table 1.1 Status of Environmental License, Notifications and Permits

Permit / License No.	Valid Period		Status
	From	Expired On	
<i>Environmental Permit</i>			
EP-602/2021	14/12/2021	-	Valid
<i>Notification Pursuant to Section 3(1) of the Air Pollution Control (Construction Dust) Regulation</i>			
Ref. No.: 487301	09/12/2022	-	Valid
<i>Billing Account for Disposal of Construction Waste</i>			
7046085	04/01/2023	-	Valid
<i>Registration of Chemical Waste Producer</i>			
WPN 5213-282-C4760-0	30/12/2022	-	Valid
<i>Effluent Discharge License under Water Pollution Control Ordinance</i>			
WT00043965-2023	31/05/2023	31/05/2028	Valid
<i>Construction Noise Permit</i>			
GW-RE0570-23	01/06/2023	31/08/2023	Expired on 31/08/2023
GW-RE1015-23	01/09/2023	31/12/2023	Valid

1.4.2 The submission status of the EP and the implementation status of the mitigation measures stated in the EP had been reviewed, all submission were submitted/ deposited to the Director of Environmental Protection (DEP) on schedule, no non-compliance of EP conditions was recorded during the reporting period. The summary of submission status under Environmental Permit EP-602/2021 are summarized in **Table 1.2**.

Table 1.2 Summary of Status of Submission under EP-602/2021

EP Condition	Title of Submission	Submission Status
1.11	Commencement Date of Construction	Notified the DEP on 22 Feb 2023
2.9	Management Organization(s)	Informed the DEP on 20 Feb 2023
2.10	Environmental Permit (EP) Submission Schedule	22 Feb 2022 (1st Submission)

EP Condition	Title of Submission	Submission Status
2.11	Construction Works Schedule and Location Plan	28 Feb 2023 (Deposited)
2.12	Construction Noise Management Plan (CNMP)	<ul style="list-style-type: none"> • 28 Feb 2023 (1st submission) • The EPD's comments were issued on 8 Mar 2023 • The revised CNMP was submitted to the EPD for comment on 31 Jul 2023. • The EPD issued further comments on 16 Aug 2023. • The CNMP was further revised, certified by the ET Leader, verified by the IEC, and issued to the EPD on 22 Aug 2023.
2.13	Waste Management Plan (WMP)	<ul style="list-style-type: none"> • 28 Feb 2023 (1st submission) • EPD's comments were issued on 3 Apr 2023. • The revised WMP was submitted to the EPD for comment on 26 July 2023. • The WMP was further updated and submitted to the EPD on 16 Aug 2023.
2.14	Landscape and Visual Mitigation Plan (LVMP)	<ul style="list-style-type: none"> • 28 Feb 2022 (1st Submission) • EPD's comments were issued on 29 Mar 2023. • The revised LVMP was certified by the ET Leader, verified by the IEC, and issued to the EPD on 22 Aug 2023.
3.3	Baseline Monitoring Report	<ul style="list-style-type: none"> • 17 Mar 2023 (1st Submission) • 27 Apr 2023 (2nd Submission) • 1 June 2023 (3rd Submission) • 13 July 2023 (Formal submission) • 3 Aug 2023 (accepted by the EPD)
3.4	Monthly EM&A Report (July 2023)	12 August 2023
4.2	Dedicated Internet Website	2 May 2023

- 1.4.3 Following the EPD's comments on the Baseline Monitoring Report (Ref. No. BMR-3.1, dated 17 March 2023), updating of air quality and noise monitoring locations were proposed, including cancellation of noise monitoring station at Tower 1, Meridian Hill (NM-1), resumption of air quality and noise monitoring stations at Block 6, Tsui Chuk Garden (i.e. DM-4 and NM-4) and proposal of new noise monitoring locations at Wo Tin House, Shatin Pass Estate (NM-5) and Sheung Fung Street Customs Staff Quarter (NM-6).
- 1.4.4 Additional baseline monitoring for air quality monitoring station DM-4, and noise monitoring stations NM-4, NM-5 and NM-6 was carried out between 2 May and 16 May 2023. The Baseline Monitoring Report was updated with all baseline monitoring results included, certified by the ET Leader, and verified by the IEC on 30 May 2023. The updated Baseline Monitoring Report was submitted to the EPD on 1 June 2023. A minor comment was received from the EPD on 26 June 2023. Following the advice from the EPD, the Report was formally submitted to the EPD on 13 July 2023 after amendment. The Report was accepted by the EPD on 3 August 2023.

1.5 Brief Summary of EM&A Requirements

Air Quality

- 1.5.1 In accordance with the EM&A Manual, the ET shall carry out impact monitoring during construction phase of the project. For 1-hour Total Suspended Particulates (TSP) monitoring, the sampling frequency of at least three times every six days should be undertaken when the highest dust impact occurs.
- 1.5.2 Action and Limit Levels for the 1-hour TSP monitoring works are discussed in **Section 2.4**. Should non-compliance of the criteria occur, action in accordance with the Event and Action Plan presented in **Appendix C** shall be carried out.
- 1.5.3 The air quality mitigation measures detailed in the EM&A Manual were recommended to be implemented during the construction phase. The implementation statuses of these measures are presented in **Appendix D**.

Noise Monitoring

- 1.5.4 Construction noise monitoring should be carried out at the designated monitoring stations directly affected by the construction works once every week after the commencement of construction. During construction works, one set of $L_{eq(30-min)}$ measurement at each station between 0700 and 1900 hours on normal weekdays shall be taken. If construction works are extended to include works during the period between 1900 and 0700 hours, additional weekly impact monitoring shall be carried out during evening and night-time works.
- 1.5.5 Action and Limit Levels for the noise monitoring are discussed in **Section 3.5**. Should non-compliance of the criteria occur, action in accordance with the Event and Action Plan presented in **Appendix C** shall be carried out.

- 1.5.6 The noise mitigation measures detailed in the EM&A Manual are recommended to be implemented during the construction phase. The implementation statuses of these measures are presented in **Appendix D**.

Environmental Requirements in Contract Documents

- 1.5.7 According to *Particular Specification (PS)*, the Contractor shall undertake environmental protection measures to reduce the environmental impacts arising from the execution of the works. The Contractor shall also observe and comply with relevant environmental protection and pollution control ordinances. The Contractor shall design, construct, operate and maintain pollution control measures to ensure compliance with the contract provisions as well as the environmental ordinances and their regulations.

- 1.5.8 The Contractor shall also:

- Implement air pollution and noise abatement practices as specified in *PS*;
- Minimise generation of wastewater from the Site;
- On-site sorting of Construction and Demolition (C&D) Materials;
- Establish a mechanism to record the quantities of C&D materials generated each month, using the monthly summary “Waste Flow Table”;
- Control the use of timbers;
- Implement a trip ticket system (TTS) for tracking the removal of C&D materials from the Site to the disposal grounds;
- Prepare an Environmental Management Plan (EMP) in accordance with GS Section 25 and *PS* for implementation on the Site to reduce environmental nuisance and C&D materials arising from Works, throughout the construction period;
- Arrange weekly environmental walk to inspect the Site, checking that the environmental performance of the Site is satisfactory and in compliance with the requirements under the contract and EMP; and
- Carry out site specific induction training about environmental management as well as safety for all staffs and workers, and provide toolbox talks for workers on environmental nuisance abatement and waste management.

2. AIR QUALITY MONITORING

2.1 Monitoring Locations

2.1.1 The air quality monitoring locations for impact monitoring during the reporting period are listed in **Table 2.1** and presented in **Figure 2.1**.

Table 2.1 Air Quality Monitoring Stations for Construction Phase

ID	Description	Coordinates	
		Northing	Easting
DM-1	Tennis Court near Tin Ma Court	822705	837047
DM-2	Chun Sing House, Tin Ma Court	822673	837143
DM-3	Grace Methodist Church Kindergarten	822782	837227
DM-4 ⁽¹⁾	Block 6, Tsui Chuk Garden	822926	837246
DM-4a ⁽²⁾	Road pavement near Wang King House, Tin Wang Court	822854	837340

Notes:

- Following the EPD's comment on the Baseline Monitoring Report (Ref. No. BRM-3.1, dated 17 March 2023), air quality monitoring at DM-4 was resumed. Baseline monitoring for air quality monitoring station DM-4 was then carried out between 2 May and 16 May 2023. Impact monitoring at DM-4 was commenced on 22 May 2023.
- An additional air quality monitoring station DM-4a was proposed by the ET and agreed by the ER, IEC and EPD.

2.2 Air Quality Monitoring Parameter, Frequency and Duration

2.2.1 **Table 2.2** summarized the monitoring parameter, duration, and frequency of impact air quality monitoring.

Table 2.2 Impact Air Quality Monitoring Parameter, Duration and Frequency

Parameter	Frequency	Duration
1-hour TSP	3 times every 6 days	Throughout the construction phase

2.3 Monitoring Equipment and Methodology and QA/ QC Procedure

Proposal of Using Portable Direct Reading Dust Meter

2.3.1 Direct reading dust meters were used for measuring 1-hour TSP levels during the impact air quality monitoring. According to Section 4.4.1 of the EM&A Manual, the proposed use of direct reading dust meters was submitted to and agreed by the IEC.

- 2.3.2 Sufficient number of monitoring instruments was prepared by the ET for carrying out the impact monitoring. All equipment and associated instrumentation were clearly labelled.
- 2.3.3 Wind data were collected from the records of Hong Kong Observatory Kai Tak Wind Station (22.30966N, 114.21336E), which is located at the south-eastern side of runway of the former Kai Tak Airport about 4.5 km south-east from the project site.
- 2.3.4 Equipment used in the impact air quality monitoring programme is summarised in **Table 2.3**. Calibration certificates for the impact air quality monitoring equipment are attached in **Appendix E**.

Table 2.3 Impact Air Quality Monitoring Equipment

Equipment	Brand and Model	Serial No.	Calibration Due Date
Direct Reading Dust Meter	Sibata LD-5R	0Z4545	29/02/2024
		882106	29/02/2024
		942532	29/02/2024

Maintenance and Calibration

- 2.3.5 Direct reading dust meters have been calibrated against high volume samplers (HVSs) annually. A 2-day, three 3-hour measurement results per day from direct reading dust meters were taken to compare with the sampling results from the HVSs. The correlation between the direct reading dust meters and the HVSs were then concluded. By accounting for the correlation factor, the direct reading dust meters are considered to achieve comparable results as that of the HVSs.
- 2.3.6 The 1-hour TSP measurement follows the instruction provided in the manufacturer's manual. Before initiating a measurement, zeroing the portable dust meter was carried out to ensure the accuracy of each measurement.

2.4 Action and Limit Levels

- 2.4.1 The action and limit levels were established in accordance with the EM&A Manual. **Table 2.4** presents the action and limits levels for 1-hour TSP monitoring. Should non-compliance of the criteria occur, action in accordance with the Event and Action Plan presented in **Appendix C** shall be carried out.

Table 2.4 Action and Limit Levels for 1-hour TSP

Monitoring Station	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
DM-1	300.1	500
DM-2	289.0	
DM-3	289.7	
DM-4	294.9	
DM-4a	291.6	

2.5 Results and Observation

2.5.1 The impact air quality monitoring was conducted on 3, 9, 15, 21 and 26 August 2023. The impact air quality monitoring schedule for the reporting period is shown in **Appendix F**.

2.5.2 The monitoring results and graphical presentation of impact air quality monitoring are shown in **Appendix G**. No action or limit levels exceedance was recorded in the reporting period.

Table 2.5 Summary of Impact 1-hour TSP Monitoring Results

Monitoring Station	TSP Concentration, $\mu\text{g}/\text{m}^3$			Action Level	Limit Level
	Average	Minimum	Maximum		
DM-1	46	15	61	300.1	500
DM-2	50	25	62	289.0	
DM-3	47	17	60	289.7	
DM-4 ⁽¹⁾	45	20	61	294.9	
DM-4a	51	30	64	291.6	

Remark: (1) Impact air quality monitoring at DM-4 was commenced on 22 May 2023.

2.5.3 During the impact air quality monitoring, the major dust sources at each monitoring stations were summarized in **Table 2.6**.

Table 2.6 Influencing Factors at/ near Air Quality Monitoring Stations

Monitoring Stations	Influencing Factors
DM-1	Not identified
DM-2	Not identified
DM-3	Not identified
DM-4	Not identified
DM-4a	Not identified

2.5.4 Weather conditions during impact monitoring are presented in **Appendix G** and extracts of wind data recorded at Kai Tak Wind Station available from the Hong Kong Observatory are presented in **Appendix H**.

3. NOISE MONITORING

3.1 Monitoring Locations

3.1.1 The monitoring locations for construction noise monitoring are listed in **Table 3.1** and shown in **Figure 3.1**.

Table 3.1 Noise Monitoring Stations during Construction Phase

ID	Description	Measurement	Coordinates	
			Northing	Easting
NM-2	Chun Sing House, Tin Ma Court	Façade	822668	837143
NM-3	Grace Methodist Church Kindergarten	Façade	822782	837227
NM-4 ⁽²⁾	Block 6, Tsui Chuk Garden	Façade	822926	837246
NM-4a ⁽¹⁾	Road pavement near Wang King House, Tin Wang Court	Free field	822854	837340
NM-5	Wo Tin House, Shatin Pass Estate	Façade	823360	838143
NM-6	Sheung Fung Street Customs Staff Quarters	Free field	823134	838412

Notes:

The noise monitoring station proposed in the EM&A Manual (NM-1) was not available for baseline and impact monitoring. Therefore, impact monitoring at NM-1 was cancelled and agreed by the ER, IEC and EPD.

(1) An additional noise monitoring station NM-4a was proposed by the ET and agreed by the ER, IEC and EPD.

(2) Following the EPD's comment on the Baseline Monitoring Report (Ref. No. BRM-3.1, dated 17 March 2023), noise monitoring station was resumed at NM-4. Baseline monitoring for noise monitoring station NM-4 was then carried out between 2 May and 16 May 2023. Impact monitoring at NM-4 was commenced on 22 May 2023.

3.1.2 No construction work was conducted within 300 m radius of noise monitoring station NM-5 and NM-6. Thus, no construction noise monitoring was carried out at these two noise monitoring stations in the reporting period.

3.2 Noise Monitoring Parameter, Frequency and Duration

3.2.1 Construction noise level was measured by the ET and measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq(30-min)}$ was adopted as the monitoring parameter for the construction noise monitoring.

3.2.2 As supplementary information for data auditing, statistical results such as L_{10} and L_{90} were also obtained for reference.

3.2.3 **Table 3.2** summarized the monitoring parameters, duration, and frequency of construction noise monitoring.

Table 3.2 Construction Noise Monitoring Parameter, Frequency and Duration

Parameters	Time	Frequency	Duration
$L_{eq(30-min)}$	0700 and 1900 hours on normal weekdays	once every week	Throughout the construction phase

3.3 Monitoring Equipment, Methodology and QA / QC Procedure

3.3.1 As referred to the technical memorandum (TM) issued under the NCO, sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications were used for carrying out the construction noise monitoring.

3.3.2 Noise measurements were not made in fog, rain, wind with a steady speed exceeding 5 m/s or wind with gusts exceeding 10 m/s. The wind speed was checked with a portable wind speed meter capable of measuring the wind speed in m/s.

3.3.3 Sufficient number of noise measuring equipment and associated instrumentation were prepared by the Environmental Team. All the equipment and associated instrumentation were clearly labelled.

3.3.4 Wind data were collected from the records of Hong Kong Observatory Kai Tak Wind Station (22.30966N, 114.21336E), which is located at the south-eastern side of runway of the former Kai Tak Airport about 4.5 km south-east from the project site.

3.3.5 The monitoring procedures are as follows:

- For façade measurement, the monitoring station was set at a point 1 m from the exterior of the sensitive receiver building façade and set at a position 1.2 m above the ground. For free-field measurement, the monitoring station was set at a position 1.2 m above the ground.
- The battery condition was checked to ensure good functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the interval were set as follows:
 - Frequency weighting: A
 - Time weighting: Fast
 - Interval: 30 minutes ($L_{eq(30-min)}$) would be determined for daytime noise by calculating the logarithmic average of six $L_{eq(5-min)}$ data
- Prior to and after each noise measurement, the meter was calibrated using an acoustic calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement is more than 1.0 dB, the measurement was

considered invalid and repeat of noise measurement will be required after re-calibration or repair of the equipment.

- At the end of the monitoring period, the values of L_{eq} , L_{90} and L_{10} were recorded. In addition, noise sources were recorded on a standard record sheet.

3.3.6 **Table 3.3** summarized the noise monitoring equipment used during the construction noise monitoring. Calibration certificates for the impact noise monitoring equipment are attached in **Appendix E**.

Table 3.3 Construction Noise Monitoring Equipment

Equipment	Model (Serial Number)	Calibration Due Date
Sound Level Meter	Nti-XL2 (A2A-13661-E0)	21/08/2023
Sound Level Meter	Nti-XL2 (A2A-13663-F0)	14/02/2024
Sound Calibrator	Rion NC 75 (35124527)	01/11/2023

3.4 Maintenance and Calibration

3.4.1 Maintenance and calibration procedures are as follows:

- The microphone head of the sound level meter and calibrator were regularly cleaned with a soft cloth; and
- The sound level meter and acoustic calibrator were calibrated annually by a HOKLAS accredited laboratory or the manufacturer.

3.5 Action and Limit Levels

3.5.1 The Action and Limit levels were established in accordance with the EM&A Manual. **Table 3.4** presents the Action and Limit Levels for construction noise. Should non-compliance of the criteria occur, action in accordance with the Event and Action Plan presented in **Appendix C** shall be carried out.

Table 3.4 Action and Limit Levels for Construction Noise Monitoring

Monitoring Stations	Action Level	Limit Level	Time Period
NM-2	When one documented complaint is received	75 dB(A)	0700 - 1900 hours on normal weekdays
NM-3		70/ 65 dB(A) *	
NM-4		75 dB(A)	
NM-4a		75 dB(A)	
NM-5		75 dB(A)	
NM-6		75 dB(A)	

Notes:

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

* 70 dB(A) for school and 65 dB(A) during school examination period.

3.6 Results and Observations

- 3.6.1 The construction noise monitoring was conducted on 3, 9, 15, 21 and 26 August 2023. The monitoring schedule is presented in **Appendix F**.
- 3.6.2 The construction noise monitoring results are summarized in **Table 3.5**. Details of the results and graphical presentation are shown in **Appendix I**.
- 3.6.3 No Action levels exceedance was recorded in the reporting period. One limit level exceedance was recorded on 3 August 2023 for construction noise monitoring station NM-4a during the reporting period. According to the information provided by the Contractor, no project related construction work was carried out near the noise monitoring station. After investigation, the exceedance is considered as non-project related construction works near the monitoring location. Details of the investigation results are shown in **Appendix L**.

Table 3.5 Summary of Construction Noise Monitoring Results

Monitoring Station ⁽¹⁾	Noise Level, dB(A)			Limit Level
	<i>Leq</i> (30-min)			
	Mean	Minimum	Maximum	
NM-2	67.4	62.3	69.3	75 dB(A)
NM-3	68.0	67.1	69.2	70/ 65 dB(A) ⁽²⁾
NM-4 ⁽³⁾	66.3	64.7	68.8	75 dB(A)
NM-4a	77.0	72.3	92.7	75 dB(A)

Note:

- (1) Construction noise monitoring at NM-4 and NM-5 will commence when construction works are undertaking near these stations.
- (2) 70 dB(A) for school and 65 dB(A) during school examination period.
- (3) Impact monitoring at NM-4 was commenced on 22 May 2023.

- 3.6.4 Weather conditions during impact monitoring are presented in **Appendix I** and extracts of wind data recorded at Kai Tak Wind Station available from the Hong Kong Observatory are presented in **Appendix H**.
- 3.6.5 During the construction noise monitoring period, the influencing factors which may affect the results are summarized in **Table 3.6**.

Table 3.6 Influencing Factors at Noise Monitoring Stations

Monitoring Stations	Influencing Factors
NM-2	Road traffic noise, construction noise from 76 Broadcast Drive project
NM-3	Road traffic noise
NM-4	Road traffic noise
NM-4a	Road traffic noise, non-project related construction activities

4. WASTE MANAGEMENT

4.1.1 Waste generated from the Project includes inert construction and demolition (C&D) materials and non-inert C&D wastes in the reporting period. The amount of waste generated by the construction works of the Project during the reporting period is shown in **Table 4.1** and the cumulative waste flow table was presented in **Appendix J**.

Table 4.1 Summary of Waste Generated in the Reporting Period

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly					Actual Quantities of C&D Wastes Recycled				
	Total Quantity Generated	Broken Concrete (including rock for recycling into aggregates)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ Cardboard Packaging	Plastics	Chemical Waste	Others e.g., general refuse	Metals	Paper/ cardboard packaging	Plastics (bottles/ containers, plastic sheets/foam package material)	Yard Waste	Others
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
Aug 2023	0.18593	0.00000	0.00000	0.00000	0.18593	0.00000	0.00000	0.00000	0.00000	0.00000	0.01659	0.0058	0.02575	0.0055	0.00000	0.00000

4.1.2 Construction and demolition (C&D) materials sorting was carried out on site. Sufficient receptacles were provided for general refuse collection and sorting. Excavated inert C&D materials were reused to minimize the disposal of C&D waste to public fill.

4.1.3 The Contractor was advised to minimize the amount of waste through recycling or reusing. All applicable mitigation measures stipulated in the EM&A Manual and waste management plans shall be fully implemented.

5. ENVIRONMENTAL SITE INSPECTION AND AUDIT

5.1.1 Site inspections were carried out by the ET on a weekly basis to monitor the implementation of proper environmental pollution control mitigation measures for the Project. During the reporting period, site inspections were carried out 3, 11, 15 25 and 31 August 2023. Joint site inspection with the ER, the Contractor and the IEC was carried out on 15 August 2023.

5.1.2 During the site inspections in the reporting period, no non-conformance was identified. Key observations and reminders during the site inspections are described in **Table 5.1**.

Table 5.1 Summary of Site Inspection Observations and Recommendations

Inspection Date	Key Observations / Reminders	Follow-up Action
3 Aug 2023	<ol style="list-style-type: none"> The general refuse and construction material should be separated before disposal. (Portion 3) (Observation) The noise barriers should be properly erected in the site area. (Portion 3) (Observation) The stockpile of dusty materials should be covered by tarpaulin. (Portion 3) (Reminder) 	<ol style="list-style-type: none"> The general refuse and construction material was separated before disposal and cleared. The noise barriers were reinstalled in the site area. The stockpile of dusty materials was covered.
11 Aug 2023	<ol style="list-style-type: none"> The Contractor was reminded to clear the sediment and refuse in the storm drain. (Portion 3) (Reminder) 	<ol style="list-style-type: none"> The sediment and refuse in the storm drain were cleared.
15 Aug 2023	No major environmental deficiency was observed.	N/A
25 Aug 2023	<ol style="list-style-type: none"> The Contractor was reminded to cover the bare slope to reduce muddy surface runoff. (Portion 3) (Reminder) 	<ol style="list-style-type: none"> The bare slope was covered to reduce muddy surface runoff.
31 Aug 2023	<ol style="list-style-type: none"> Potential oil leakage from the breaker tip was observed. The contractor was requested to clear the oil stain on the ground and dispose of the by-product as chemical waste. (Lung Fung Street) (Observation) The Contractor was reminded to reinstate the impervious sheeting and cover the bare slope to reduce muddy surface runoff. (Portion n3) (Reminder) The Contractor was reminded to display the Environmental Permit at the site exit. (Tsz Wan Shan Road near Shatin Pass Estate) (Reminder) 	<ol style="list-style-type: none"> The oil stain on the ground was cleared and processed as chemical waste. The bare slope was covered by the impervious sheeting to reduce muddy surface runoff. The Environmental Permit at the site exit was displayed.

- 5.1.3 According to the EIA Report, EP and the EM&A Manual, the mitigation measures detailed in the documents are recommended to be implemented during the construction phase. A summary of the Project Implementation Schedule is provided in **Appendix D**.

6. ENVIRONMENTAL NON-COMPLIANCE

6.1 Summary of Exceedance

- 6.1.1 No Action Level or Limit Level exceedance was recorded for 1-hour TSP monitoring in the reporting period.
- 6.1.2 No Action Level exceedance was recorded in the reporting period. One Limit Level exceedance was recorded on 3 August 2023 in the reporting period. After the investigation, the exceedance was considered as non-project related. Details of the investigation results are shown in **Appendix L**.
- 6.1.3 An exceedance of construction noise Limit Level was recorded on 3 August 2023 in the reporting period. Follow-up actions in accordance with the Event and Action Plan in **Appendix C** were carried out and summarised in **Table 6.1**.

Table 6.1 Summary of Event and Action Plans

Event	Action	Follow-up Action
Limit Level Exceedance of Construction Noise	1. Identify source;	1. The non-project related construction works near the monitoring location (NM-4a) was identified as the noise source related to the Limit Level exceedance.
	2. Inform IEC, ER, EPD and Contractor;	2. Notification of exceedance have been issued to the IEC, the Contractor, the Engineer's Representative and the EPD.
	3. Repeat measurements to confirm findings;	3. Repeated measurement was carried out to confirm the limit level exceedance at NM-4a.
	4. Increase monitoring frequency;	4. Increase in monitoring frequency was not carried out as the exceedance is considered non-project related.
	5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;	5. No additional mitigation measure was proposed as the exceedance is considered non-project related.
	6. Inform IEC, ER and EPD the causes and actions taken for the exceedances;	6. The ET would review the site condition after the exceedance. If further non-project related exceedance was recorded, the ET would propose suspension of noise monitoring or relocation of noise monitoring station, wherever appropriate.

Event	Action	Follow-up Action
	7. Assess effectiveness of Contractor’s remedial actions and keep IEC, EPD and ER informed of the results;	7. No remedial action was proposed as the exceedance is considered non-project related.
	8. If exceedance stops, cease additional monitoring.	8. No additional monitoring was proposed as the exceedance is considered non-project related.

6.2 Summary of Environmental Non-Compliance

6.2.1 No environmental non-compliance was recorded in the reporting period.

6.3 Summary of Environmental Complaint

6.3.1 No environmental complaint was received in the reporting period. The Cumulative Complaint Log is presented in **Appendix K**.

6.4 Summary of Environmental Summon and Successful Prosecution

6.4.1 There was no successful environmental prosecution or notification of summons received since the Project commencement. The Cumulative Log for environmental summon and successful prosecution is presented in **Appendix K**.

7. FUTURE KEY ISSUE

7.1 Construction Works and Potential Environmental Issues in the next Reporting Period

7.1.1 The construction programme for the Project for the next reporting period is presented in **Appendix A**.

7.1.2 Works to be undertaken in the next two months are summarized below:

- Jacking pit construction for pipe jacking;
- Trial pit excavation;
- Formation of piling platform at +89.0mPD;
- Pipe piling for PAB ELS wall;
- Site compound set up; and
- ELS works in Portion 3.

7.1.3 Potential environmental impacts arising from the above construction activities are mainly associated with construction dust impact, noise impact, water quality impact, waste management and landscape and visual.

7.2 Recommendation

7.2.1 The key environmental mitigation measures for the Project in the coming reporting period associated with the above construction activities will include:

Dust

- Regular watering to reduce dust emissions from the exposed site surface;
- Stockpile of dusty materials shall be covered entirely by impervious sheeting;
- Provide vehicles washing facilities at all site exits to wash away any dusty materials from vehicle body;
- NRMM Labels should be displayed on the applicable equipment on site by the Contractor;
- All vehicle and plant should be cleaned before they leave a construction site.

Noise

- Only well-maintained plant should be operated on-site, and plant should be maintained regularly during the construction programme;

- Quality Powered Mechanical Equipment (QPME) should be adopted as far as possible.

Water Quality

- No effluent discharge would be allowed before the effluent discharge license is acquired.
- Surface run-off from construction sites should be discharged into dedicated discharge point via adequately designed sand/ silt removal facilities;
- Channels/ earth bunds/ sandbags barriers should be provided on site to properly direct stormwater to silt removal facilities;
- Silt removal facilities, channels and manholes should be maintained, and the deposited silt and grit should be removed regularly;
- Open stockpiles of construction materials on sites should be covered with tarpaulin or similar fabric during rainstorms;
- Perimeter channels should be provided on site boundaries where necessary to intercept stormwater run-off from outside the site so that it will not wash across the site;
- Bare slope should be covered completely by using canvas to reduce muddy surface runoff during typhoons and rainstorms.

Waste Management

- Provision of sufficient waste disposal points and regular collection of waste;
- Regular cleaning and maintenance programme for drainage system;
- Chemical containers shall be stored with drip tray underneath;
- Storage, handling, transport, and disposal of chemical waste should be arranged in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published by EPD, and collected by a licensed chemical waste collector.

Ecology

- Minimize loss of habitats and associated wildlife;
- Using directional lighting to prevent excessive light spill into adjacent natural habitat and disturbance to nocturnal fauna.

Landscape and Visual

- Adequate tree protection measures shall be provided for the trees to be retained on site.

8. CONCLUSION, COMMENTS AND RECOMMENDATION

8.1 Conclusion

- 8.1.1 This is the 5th Monthly EM&A Report presenting the EM&A works during the reporting period from 1 August 2023 to 31 August 2023 in accordance with the EM&A Manual.
- 8.1.2 No Action Level or Limit Level exceedance was recorded for 1-hour TSP monitoring in the reporting period.
- 8.1.3 No Action level exceedance was recorded in the reporting period. One Limit Level exceedance was recorded on 3 August 2023 in the reporting period. After the investigation, the exceedance was considered as non-project related.
- 8.1.4 Environmental site inspections were conducted on 3, 11, 15, 25 and 31 August 2023 by the ET in the reporting period.
- 8.1.5 No environmental complaint was received in the reporting period.
- 8.1.6 No notification of summons and prosecution was received in the reporting period.
- 8.1.7 The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.
- 8.1.8 No change to the EM&A programme was made in this reporting period.



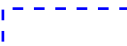
8.2 Comments and Recommendations

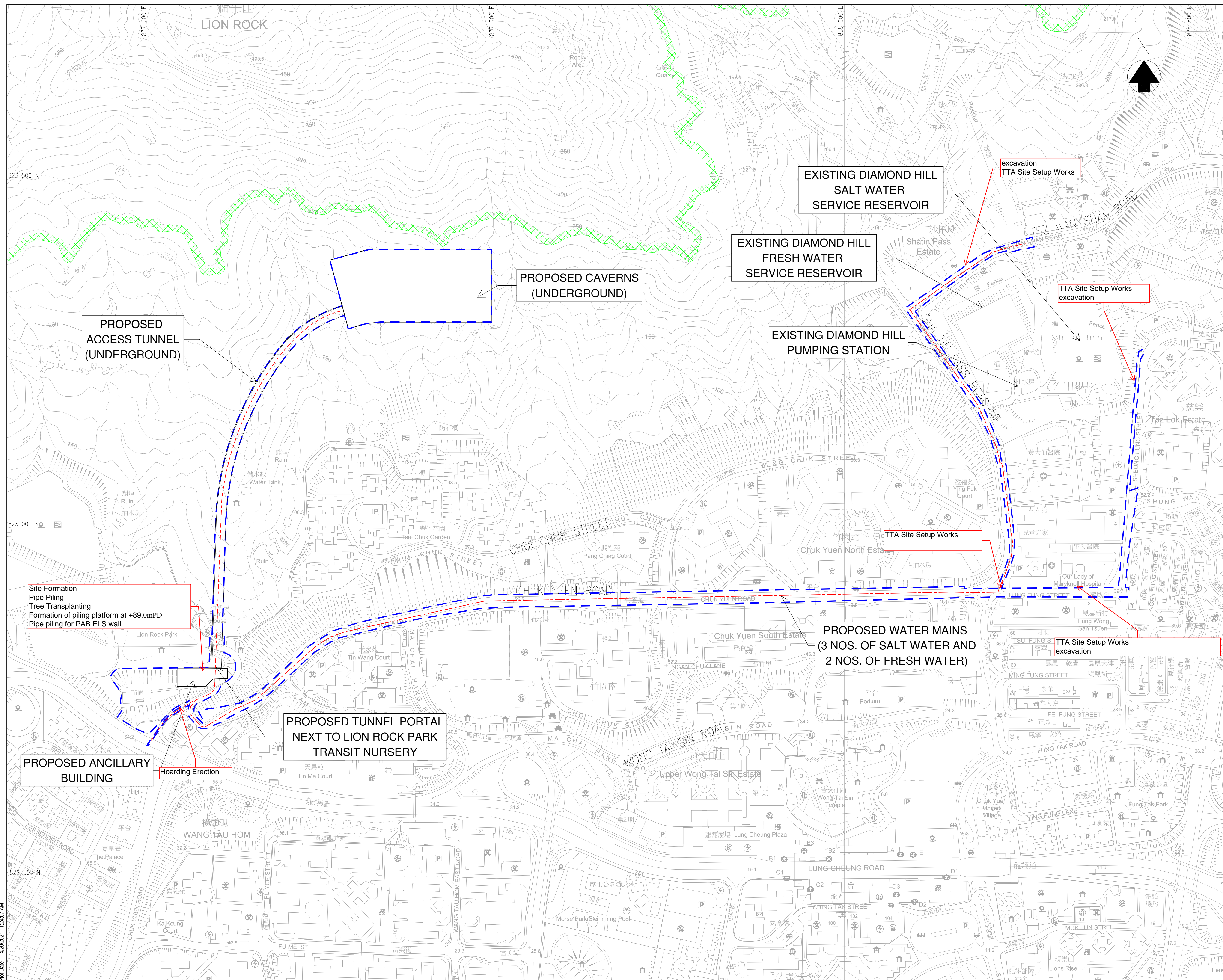
- 8.2.1 The proposed mitigation measures were properly implemented and were considered effective and efficient in pollution control.
- 8.2.2 The ET had no recommendation following the completion of EM&A in the reporting period.

Figures

NOTES:
 COPYRIGHT RESERVED
 THIS PRINT MAY NOT BE COPIED, TRACED, OR EXHIBITED WITHOUT PERMISSION OF THE WATER AUTHORITY.
 1. ALL DIMENSION ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
 2. THE BASE PLAN IS EXTRACTED FROM SURVEY SHEET NOS. 11-NE-A & 11-NW-B.

LEGEND:

-  COUNTRY PARK BOUNDARY
-  PROPOSED WATER MAINS
-  PROJECT BOUNDARY



Revision	Date	Description	Initial
Initial	03/21	KMF	YHP
Design	03/21	YHP	SZ
Drawn	03/21	SZ	YHP
Checked	03/21	YHP	YHP

Agreement No. CE 15/2018 (WS)

Project Title
 RELOCATION OF DIAMOND HILL FRESH WATER AND SALT WATER SERVICE RESERVOIRS TO CAVERNS

Drawing Title
PROJECT LAYOUT

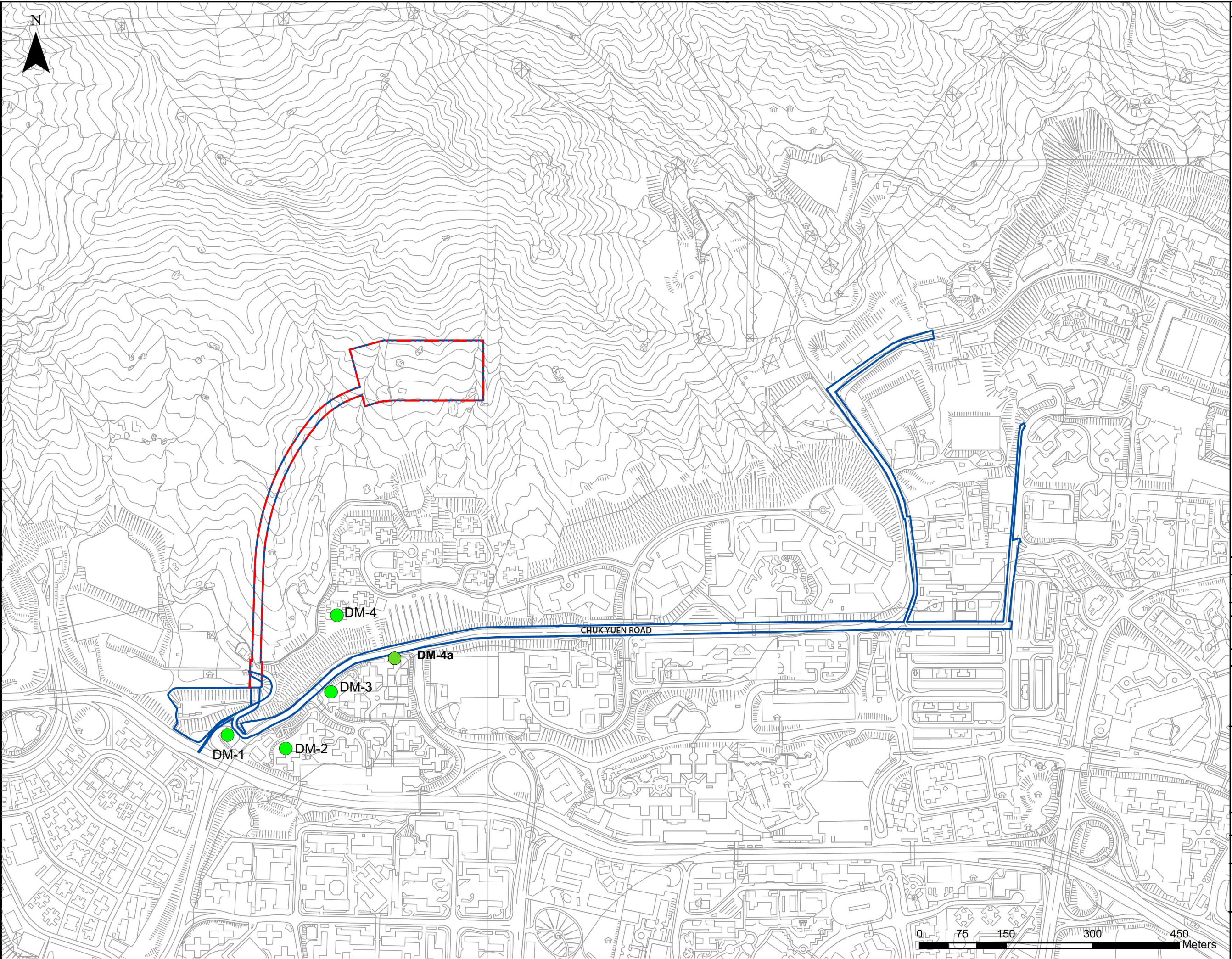
Drawing No. **FIGURE 2.1**

Scale
 A1 1 : 2500
 A3 1 : 5000



Pld Date : 4/20/2021 11:24:07 AM
 File Name : Y:\Daily Work\20210419\m\MARKUP-1401049-B&V-AT-005-G-T1
 Y:\Daily Work\20210419\m\MARKUP-1401049-B&V-AT-005-G-T1.dwg, 4/20/2021 11:23:59 AM, zhs51169

- Legend**
- PROJECT SITE BOUNDARY
 - - - CAVERN AND TUNNEL (UNDERGROUND)
 - CONSTRUCTION DUST MONITORING STATION



Revision	Description			
	Designed	Reviewed	Drawn	Checked
Initial	Wing	ET	Wing	ET
Date	05/21	05/21	05/21	05/21

Approved

Agreement No. **CE15/2018 (WS)**

Project Title
**RELOCATION OF DIAMOND HILL
 FRESH WATER AND SALT WATER
 SERVICE RESERVOIRS TO CAVERNS
 - INVESTIGATION, DESIGN AND
 CONSTRUCTION**

Figure Title
**Location of Air Quality
 Monitoring Stations**

Drawing No. **Figure 2.1** Revision

Scale **A3: 1:6,000**

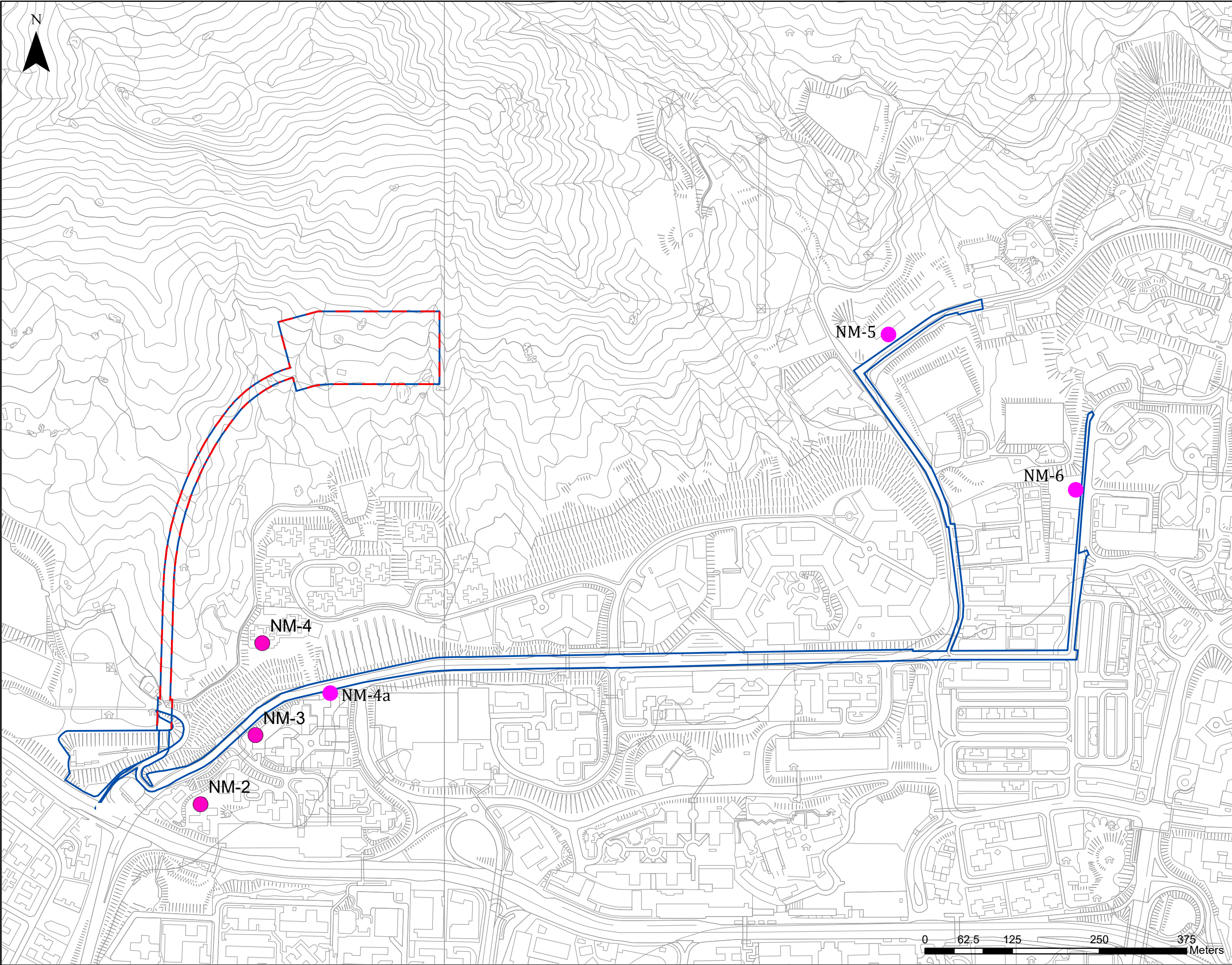
Client
 **水務署
 Water Supplies
 Department**

Consultant

**BINNIES HONG KONG LIMITED
 實尼新工程顧問有限公司**

Legend

- PROJECT SITE BOUNDARY
- - - CAVERN AND TUNNEL (UNDERGROUND)
- CONSTRUCTION NOISE MONITORING STATION



Revision	Description			
	Designed	Reviewed	Drawn	Checked
Initial	Wing	ET	Wing	ET
Date	03/21	03/21	03/21	03/21

Approved

Agreement No. CE15/2018 (WS)

Project Title
**RELOCATION OF DIAMOND HILL
 FRESH WATER AND SALT WATER
 SERVICE RESERVOIRS TO CAVERNS
 - INVESTIGATION, DESIGN AND
 CONSTRUCTION**

Figure Title
**Locations of Noise
 Monitoring Station**

Drawing No. Figure 3.1 Revision B

Scale A3: 1:5,000

Client
 水務署
 Water Supplies
 Department

Consultant

 BINNIES HONG KONG LIMITED
 賓尼新工程顧問有限公司

Appendix A

Master Construction Programme for the Project

**21/WSD/21 - Relocation of Diamond Hill Fresh Water and
Salt Water Service Reservoirs to Cavern
Monthly Programme January 2023**

Activity ID	Activity Name	Activity % Complete	1st Prog. Dur.	Original Duration	1st Prog. Start	1st Prog. Finish	Start	Finish	Total Float	2023												2024												2025												2026												2027				
										N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A											
SW-PAB1030	Hoarding Erection and Site Setup	0%	10	10	13-Apr-23	22-Apr-23	13-Apr-23	22-Apr-23	0	■ Hoarding Erection and Site Setup																																																				
SW-PAB1040	Tree Treatment and Site Clearance	0%	49	49	23-Apr-23	10-Jun-23	23-Apr-23	10-Jun-23	0	■ Tree Treatment and Site Clearance																																																				
SW-PAB1050	Survey, Trial pit, UU detection, Condition survey	0%	40	40	11-Jun-23	20-Jul-23	11-Jun-23	20-Jul-23	242	■ Survey, Trial pit, UU detection, Condition survey																																																				
Foundation, Sub-Structure and Retaining Structure			579	579	07-Jun-23	20-May-25	07-Jun-23	20-May-25	246	▶ 20-May-25, Foundation, Sub-Structure and Retaining Structure																																																				
Northern Side of PAB (RHS) (Zone 2)			356	356	07-Jun-23	15-Aug-24	07-Jun-23	15-Aug-24	469	▶ 15-Aug-24, Northern Side of PAB (RHS) (Zone 2)																																																				
SW-PAB-2110	Implement TTA to shift Lion Rock Road traffic westward to provide sufficient space for pipe pile installation	0%	2	2	07-Jun-23	08-Jun-23	07-Jun-23	08-Jun-23	293	■ Implement TTA to shift Lion Rock Road traffic westward to provide sufficient space for pipe pile installation																																																				
SW-PAB-2120	Removal of road pavement and site clearance, surveying, UU detection, diversion (if any)	0%	20	20	09-Jun-23	28-Jun-23	09-Jun-23	28-Jun-23	361	■ Removal of road pavement and site clearance, surveying, UU detection, diversion (if any)																																																				
SW-PAB-2000	Construction of Concrete Block Wall and Form a Working Platform at +85mPD (7d+3d) (start after 8no pipe pile by 1rig)	0%	10	10	20-Jun-23	03-Jul-23	20-Jun-23	03-Jul-23	28	■ Construction of Concrete Block Wall and Form a Working Platform at +85mPD (7d+3d) (start after 8no pipe pile by 1rig)																																																				
SW-PAB-2010	Soil Excavation for Southern Ramp (Total: 2689m3) (PR=180m3/d)	0%	15	15	20-Jun-23	08-Jul-23	20-Jun-23	08-Jul-23	285	■ Soil Excavation for Southern Ramp (Total: 2689m3) (PR=180m3/d)																																																				
SW-PAB-2150	Installation of Pipe Pile (273dia) along Lion Rock Road (Total: 53no.) (PR=1d/pile/rig) (2rigs) plus 1 wk for grouting	0%	33	33	10-Jul-23	16-Aug-23	10-Jul-23	16-Aug-23	285	■ Installation of Pipe Pile (273dia) along Lion Rock Road (Total: 53no.) (PR=1d/pile/rig) (2rigs) plus 1 wk for grouting																																																				
SW-PAB-2020	Installation of King Post (Total: 3no) (PR=2.5d/pile/rig) (2 rigs)	0%	5	5	24-Jul-23	28-Jul-23	24-Jul-23	28-Jul-23	11	■ Installation of King Post (Total: 3no) (PR=2.5d/pile/rig) (2 rigs)																																																				
SW-PAB-2030	Installation of Pipe Pile at RHS of Portal (Total: 15no) (PR=2.5d/pile/rig) (2 rigs) + 3d remobilization	0%	22	22	29-Jul-23	23-Aug-23	29-Jul-23	23-Aug-23	11	■ Installation of Pipe Pile at RHS of Portal (Total: 15no) (PR=2.5d/pile/rig) (2 rigs) + 3d remobilization																																																				
SW-PAB-2040	Erection of Steel Platform for Bored Pile Construction	0%	22	22	24-Aug-23	18-Sep-23	24-Aug-23	18-Sep-23	279	■ Erection of Steel Platform for Bored Pile Construction																																																				
SW-PAB-2050	Plant mobilization and Installation of Bored Pile on Steel Platform (Total: 4no) (PR=22d/pile/rig) (1 rigs)	0%	88	88	27-Dec-23	15-Apr-24	27-Dec-23	15-Apr-24	199	■ Plant mobilization and Installation of Bored Pile on Steel Platform (Total: 4no) (PR=22d/pile/rig) (1 rigs)																																																				
SW-PAB-2060	Plant Demobilization and Removal of Steel Platform	0%	7	7	16-Apr-24	23-Apr-24	16-Apr-24	23-Apr-24	473	■ Plant Demobilization and Removal of Steel Platform																																																				
SW-PAB-2070	Soil Excavation to Formation Level and ELS Installation (Total: 2217m3) (PR=200m3/d) +8d ELS	0%	19	19	24-Apr-24	17-May-24	24-Apr-24	17-May-24	473	■ Soil Excavation to Formation Level and ELS Installation (Total: 2217m3) (PR=200m3/d) +8d ELS																																																				
SW-PAB-2080	Pile Test @ Grid BB-EE (Total: 4no.)	0%	30	30	18-May-24	16-Jun-24	18-May-24	16-Jun-24	578	■ Pile Test @ Grid BB-EE (Total: 4no.)																																																				
SW-PAB-2100	Construction of Retainig Wall RW3 and Backfill work	0%	90	90	18-May-24	15-Aug-24	18-May-24	15-Aug-24	578	■ Construction of Retainig Wall RW3 and Backfill work																																																				
SW-PAB-2090	Trim Pile Head, Construction of Pile Cap @ Grid BB-EE, 3m thk	0%	60	60	17-Jun-24	15-Aug-24	17-Jun-24	15-Aug-24	578	■ Trim Pile Head, Construction of Pile Cap @ Grid BB-EE, 3m thk																																																				
Northern Side of PAB (LHS) (Zone 1)			570	570	17-Jun-23	20-May-25	17-Jun-23	20-May-25	201	▶ 20-May-25, Northern Side of PAB (LHS) (Zone 1)																																																				
SW-PAB-3000	Installation of mini-pile for support steel platform (Total: 22no) (PR=1.5d/pile/rig) (1rigs)	0%	33	33	17-Jun-23	27-Jul-23	17-Jun-23	27-Jul-23	376	■ Installation of mini-pile for support steel platform (Total: 22no) (PR=1.5d/pile/rig) (1rigs)																																																				
SW-PAB-3010	Construction of RC footing on mini-pile	0%	24	24	14-Jul-23	10-Aug-23	14-Jul-23	10-Aug-23	376	■ Construction of RC footing on mini-pile																																																				
SW-PAB-3020	Installation of Sheet Pile (Total: 10m, 240m2) (PR=40m2/d/piler) (1 piler)	0%	6	6	21-Jul-23	27-Jul-23	21-Jul-23	27-Jul-23	199	■ Installation of Sheet Pile (Total: 10m, 240m2) (PR=40m2/d/piler) (1 piler)																																																				
SW-PAB-3040	Installation of Sheet Pile (Total: 15m, 360m2) (PR=40m2/d/piler) (1 piler)	0%	9	9	28-Jul-23	07-Aug-23	28-Jul-23	07-Aug-23	199	■ Installation of Sheet Pile (Total: 15m, 360m2) (PR=40m2/d/piler) (1 piler)																																																				
SW-PAB-3030	Soil Excavation to reach 1:8 fall for King Post Installation	0%	6	6	28-Jul-23	03-Aug-23	28-Jul-23	03-Aug-23	296	■ Soil Excavation to reach 1:8 fall for King Post Installation																																																				
SW-PAB-3050	Soil Excavation and ELS installation - Stage 1 (Total: 2700m3) (PR=180m3/d) + 8d ELS	0%	23	23	29-Aug-23	23-Sep-23	29-Aug-23	23-Sep-23	338	■ Soil Excavation and ELS installation - Stage 1 (Total: 2700m3) (PR=180m3/d) + 8d ELS																																																				
SW-PAB-3100	Installation of Remaining Sheet Pile (Total: 42m, 930m2) (PR=40m2/d/piler) (1 piler)	0%	24	24	29-Aug-23	25-Sep-23	29-Aug-23	25-Sep-23	555	■ Installation of Remaining Sheet Pile (Total: 42m, 930m2) (PR=40m2/d/piler) (1 piler)																																																				

■ 1st Programme Baseline ◆ 1st Programme Baseline Milestone
■ Actual Work ◆ Milestone
■ Remaining Work ▶ Summary
■ Critical Remaining Work

Date	Revision	Checked	Approved
12-Dec-22	First Programme		
12-Jan-23	Monthly Programme January 2023		

**21/WSD/21 - Relocation of Diamond Hill Fresh Water and
Salt Water Service Reservoirs to Cavern
Monthly Programme January 2023**

Activity ID	Activity Name	Activity % Complete	1st Prog. Dur.	Original Duration	1st Prog. Start	1st Prog. Finish	Start	Finish	Total Float	2023												2024												2025												2026												2027				
										N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M
SW-PAB-3060	Erection of Steel Platform for Bored Pile Construction	0%	24	24	25-Sep-23	25-Oct-23	25-Sep-23	25-Oct-23	338													■ Erection of Steel Platform for Bored Pile Construction																																								
SW-PAB-3070	Installation of Bored Pile on Steel Platform (Total: 7no) (PR=22d/pile/rig) (1 rigs)	0%	154	154	16-Apr-24	19-Oct-24	16-Apr-24	19-Oct-24	199													■ Installation of Bored Pile on Steel Platform (Total: 7no) (PR=22d/pile/rig)																																								
SW-PAB-3070a	Pile Test @ Grid U-BB (Total: 7no.)	0%	66	66	17-Sep-24	21-Nov-24	17-Sep-24	21-Nov-24	249													■ Pile Test @ Grid U-BB (Total: 7no.)																																								
SW-PAB-3080	Removal of Steel Platform	0%	12	12	22-Nov-24	05-Dec-24	22-Nov-24	05-Dec-24	199													■ Removal of Steel Platform																																								
SW-PAB-3110	Soil Excavation to Formation Level and ELS Installation (Total: 5000m3) (PR=300m3/d) + 8d ELS	0%	25	25	06-Dec-24	07-Jan-25	06-Dec-24	07-Jan-25	199													■ Soil Excavation to Formation Level and ELS Installation (Total: 5000m3) (PR=300m3/d) + 8d ELS																																								
SW-PAB-3130	Trim Pile Head, Construction of Pile Cap @ Grid U-BB, 3m thk from FL 77.83mPD	0%	90	90	20-Feb-25	20-May-25	20-Feb-25	20-May-25	244													■ Trim Pile Head, Construction of Pile Cap @ Grid U-BB, 3m thk from FL 77.83mPD																																								
Southern Side of PAB			499	499	08-Aug-23	10-Apr-25	08-Aug-23	10-Apr-25	242													▶ 10-Apr-25, Southern Side of PAB																																								
SW-PAB-4000	Installation of Sheet Pile (Total: 60m, 720m2) (PR=40m2/d/piler)	0%	18	18	08-Aug-23	28-Aug-23	08-Aug-23	28-Aug-23	199													■ Installation of Sheet Pile (Total: 60m, 720m2) (PR=40m2/d/piler)																																								
SW-PAB-4010	Construction of Concrete Block Wall and Form a Working Platform at +84mPD (26d + 6d)	0%	32	32	29-Aug-23	06-Oct-23	29-Aug-23	06-Oct-23	199													■ Construction of Concrete Block Wall and Form a Working Platform at +84mPD (26d + 6d)																																								
SW-PAB-4020	Installation of Bored Pile on Working Platform (Total: 3no) (PR=22d/pile/rig) (1 rigs)	0%	66	66	07-Oct-23	23-Dec-23	07-Oct-23	23-Dec-23	199													■ Installation of Bored Pile on Working Platform (Total: 3no) (PR=22d/pile/rig) (1 rigs)																																								
SW-PAB-4030	Pile Test @ Grid U-BB (Total: 3no.)	0%	50	50	11-Dec-23	29-Jan-24	11-Dec-23	29-Jan-24	619													■ Pile Test @ Grid U-BB (Total: 3no.)																																								
SW-PAB-4040	Removal of Platform and Concrete Block	0%	21	21	30-Jan-24	24-Feb-24	30-Jan-24	24-Feb-24	502													■ Removal of Platform and Concrete Block																																								
SW-PAB-4050	Construction of Retaining Wall RW1 and RW2 by Open Cut Method	0%	90	90	25-Feb-24	24-May-24	25-Feb-24	24-May-24	619													■ Construction of Retaining Wall RW1 and RW2 by Open Cut Method																																								
SW-PAB-4060	Installation of Bored Pile on ground at FEL (Total: 3no) (PR=22d/pile/rig) (1 rigs)	0%	66	66	14-Dec-24	07-Mar-25	14-Dec-24	07-Mar-25	199													■ Installation of Bored Pile on ground at FEL (Total: 3no) (PR=22d/pile/rig) (1 rigs)																																								
SW-PAB-4070	Pile Test @ Grid U-BB (Total: 3no.)	0%	50	50	20-Feb-25	10-Apr-25	20-Feb-25	10-Apr-25	244													■ Pile Test @ Grid U-BB (Total: 3no.)																																								
Structure Works			986	986	04-Aug-23	26-Nov-26	04-Aug-23	26-Nov-26	1													▶ 26-Nov-26																																								
Building Structure - Grid No. U - BB			727	727	04-Aug-23	13-Jan-26	04-Aug-23	13-Jan-26	260													▶ 13-Jan-26, Building Structure - Grid No. U - BB																																								
SW-PAB-S2000	Installation of Tower Crane	0%	5	5	04-Aug-23	09-Aug-23	04-Aug-23	09-Aug-23	354													■ Installation of Tower Crane																																								
SW-PAB-S3000	Commencement of Building Structure	0%	0	0	21-May-25		21-May-25		244													◆ Commencement of Building Structure																																								
SW-PAB-S3010	Column, Beam & Floor Slab @ Ground Floor +78mPD (from Pile Cap @ +75mPD) incl. scaffold erection	0%	35	35	21-May-25	24-Jun-25	21-May-25	24-Jun-25	244													■ Column, Beam & Floor Slab @ Ground Floor +78mPD (from Pile Cap @ +75mPD) incl. scaffold erection																																								
SW-PAB-S3020	RC Column and RC Wall @ above Ground Floor	0%	26	26	25-Jun-25	20-Jul-25	25-Jun-25	20-Jul-25	244													■ RC Column and RC Wall @ above Ground Floor																																								
SW-PAB-S3030	RC Beam & Floor Slab @ First Floor +84.25mPD incl. scaffold erection	0%	35	35	21-Jul-25	24-Aug-25	21-Jul-25	24-Aug-25	244													■ RC Beam & Floor Slab @ First Floor +84.25mPD incl. scaffold erection																																								
SW-PAB-S3040	RC Column and RC Wall @ above First Floor	0%	26	26	25-Aug-25	19-Sep-25	25-Aug-25	19-Sep-25	244													■ RC Column and RC Wall @ above First Floor																																								
SW-PAB-S3050	RC Beam & Floor Slab @ Roof +91.5mPD incl. scaffold erection	0%	35	35	20-Sep-25	24-Oct-25	20-Sep-25	24-Oct-25	244													■ RC Beam & Floor Slab @ Roof +91.5mPD incl. scaffold erection																																								
SW-PAB-S3060	RC Column and RC Wall @ above Roof	0%	14	14	25-Oct-25	07-Nov-25	25-Oct-25	07-Nov-25	318													■ RC Column and RC Wall @ above Roof																																								
SW-PAB-S3080	RC Stairs	0%	21	21	25-Oct-25	14-Nov-25	25-Oct-25	14-Nov-25	378													■ RC Stairs																																								
SW-PAB-S3070	Roof Canopy @ +95.8mPD incl. scaffold erection	0%	21	21	08-Nov-25	28-Nov-25	08-Nov-25	28-Nov-25	318													■ Roof Canopy @ +95.8mPD incl. scaffold erection																																								

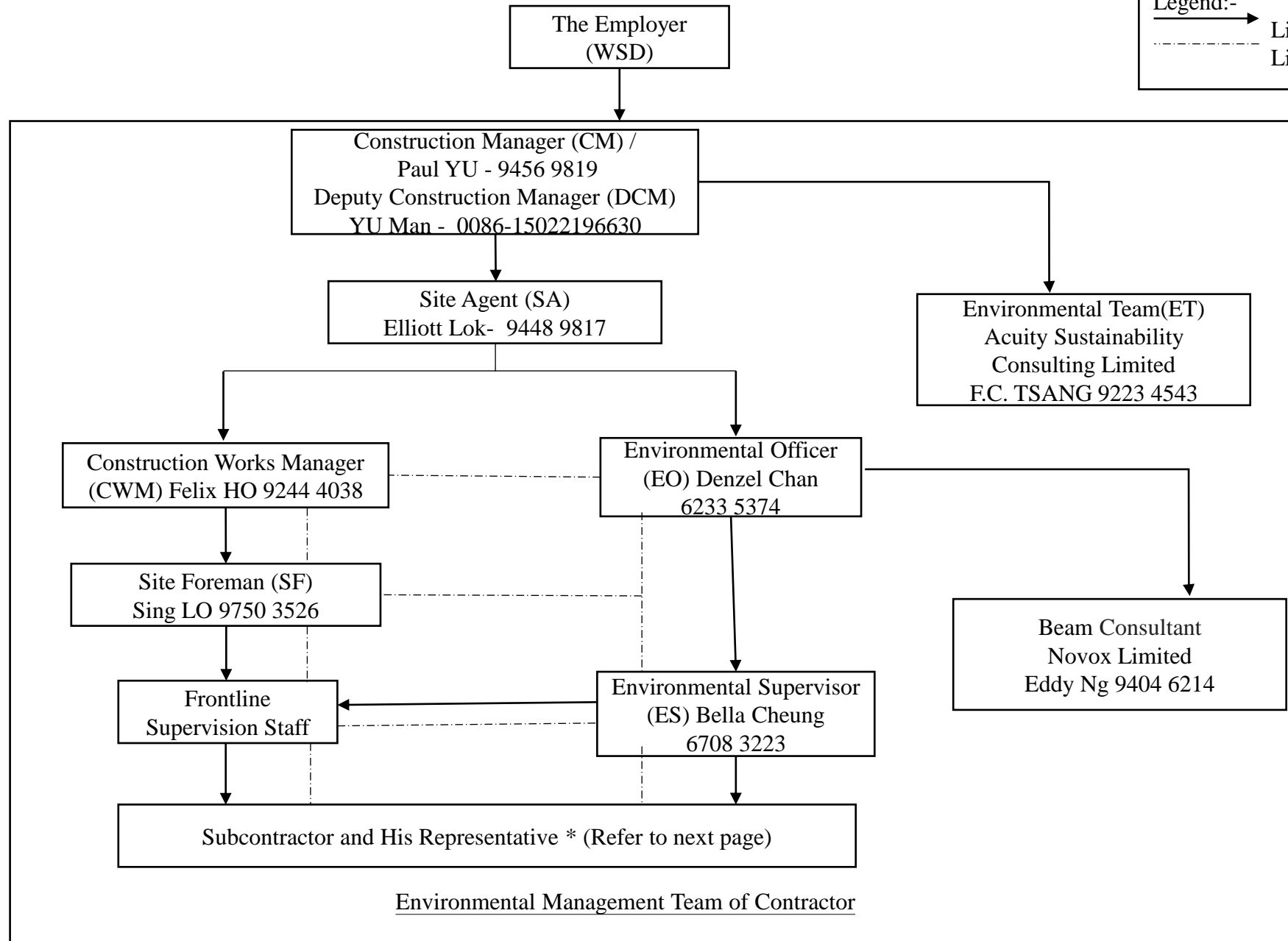
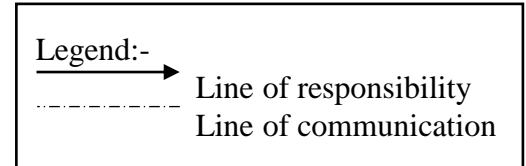
- 1st Programme Baseline
- Actual Work
- Remaining Work
- Critical Remaining Work
- 1st Programme Baseline Milestone
- Milestone
- Summary

Date	Revision	Checked	Approved
12-Dec-22	First Programme		
12-Jan-23	Monthly Programme January 2023		

Appendix B

Project Organization Chart and Key Personnel Contact

Appendix A – Project Organization Chart of Chun Wo – Sinohydro JV



Subcontractors and His Representative

Company	Workers' Representative	Contact No.
Toyo Greenland	Sandy Chan	9231 5419
Gorgeous	Thomas Chan	9600 3231
Bo Pak	Wong Man Ki	5395 7433
Shing Kei	Lam Shing Kei	9050 4651
Wing Loi	W.F Leung	9231 7779
Harvest	Law Chun Wai	9352 9999
Benny Chung	Wing Wo	6480 7623
Wong Tak Shing	Wo Kai	6020 8095
Samuel Cheung	Wan Kei	5368 3982

Appendix C

Event and Action Plans

Table C1 Event and Action Plan for Air Quality (Dust)

Event	Action			
	ET Leader	IEC	ER	Contractor
Action Level exceedance for one sample	<ul style="list-style-type: none"> Identify source, investigate the causes of exceedance and propose remedial measures; Inform IEC and ER; Repeat measurement to confirm finding; Increase monitoring frequency to daily. 	<ul style="list-style-type: none"> Check monitoring data submitted by ET; Check contractor's working method. 	<ul style="list-style-type: none"> Notify Contractor. 	<ul style="list-style-type: none"> Rectify any unacceptable practice; Amend working methods if appropriate.
Action level exceedance for two or more consecutive samples	<ul style="list-style-type: none"> Identify source; Inform IEC and ER; Advise the ER on the effectiveness of the proposed remedial measures; Repeat measurements to confirm findings; Increase monitoring frequency to daily; Discuss with IEC and Contractor on remedial actions required; If exceedance continues, arrange meeting with IEC and ER; If exceedance stops, cease additional monitoring. 	<ul style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor's working method; Discuss with ET and Contractor on possible remedial measures; Advise the ET on the effectiveness of the proposed remedial measures; Supervise Implementation of remedial measures. 	<ul style="list-style-type: none"> Confirm receipt of notification of failure in writing; Notify Contractor; Ensure remedial measures properly implemented. 	<ul style="list-style-type: none"> Submit proposals for remedial actions to ER within 3 working days of notification; Implement the agreed proposals; Amend proposal if appropriate.
Limit level exceedance for one sample	<ul style="list-style-type: none"> Identify source, investigate the causes of exceedance and propose remedial measures; 	<ul style="list-style-type: none"> Check monitoring data submitted by ET; 	<ul style="list-style-type: none"> Confirm receipt of notification of failure in writing; 	<ul style="list-style-type: none"> Take immediate action to avoid further exceedance;

Event	Action			
	ET Leader	IEC	ER	Contractor
	<ul style="list-style-type: none"> • Inform ER, Contractor and EPD; • Repeat measurement to confirm finding; • Increase monitoring frequency to daily; • Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 	<ul style="list-style-type: none"> • Check Contractor's working method; • Discuss with ET and Contractor on possible remedial measures; • Advise the ER on the effectiveness of the proposed remedial measures; • Supervise implementation of remedial measures. 	<ul style="list-style-type: none"> • Notify Contractor; • Ensure remedial measures properly implemented. 	<ul style="list-style-type: none"> • Submit proposals for remedial actions to IEC within 3 working days of notification; • Implement the agreed proposals; • Amend proposal if appropriate.
Limit level exceedance for two or more consecutive samples	<ul style="list-style-type: none"> • Notify IEC, ER, Contractor and EPD; • Identify source; • Repeat measurement to confirm findings; • Increase monitoring frequency to daily; • Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; • Arrange meeting with IEC and ER to discuss the remedial actions to be taken; • Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; • If exceedance stops, cease additional monitoring. 	<ul style="list-style-type: none"> • Discuss amongst ER, ET, and Contractor on the potential remedial actions; • Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; • Supervise the implementation of remedial measures. 	<ul style="list-style-type: none"> • Confirm receipt of notification of failure in writing; • Notify Contractor; • In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; • Ensure remedial measures properly implemented; • If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ul style="list-style-type: none"> • Take immediate action to avoid further exceedance; • Submit proposals for remedial actions to IEC within 3 working days of notification; • Implement the agreed proposals; • Resubmit proposals if problem still not under control; • Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Table C2 Event/Action Plan for Construction Noise

Event	Action			
	ET	IEC	ER	Contractor
Action Level Exceedance	<ol style="list-style-type: none"> 1. Notify IEC, ER and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC and ER; 2. Implement noise mitigation proposals.
Limit Level Exceedance	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC, ER, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to the IEC within three working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Table C3 Event/Action Plan for Landscape and Visual

Event	Action			
	ET	IEC	ER	Contractor
Action Level Exceedance	<ol style="list-style-type: none"> 1. Inform the IEC, ER and the Contractor; 2. Discuss remedial actions with IEC, ER and Contractor; and 3. Monitor remedial actions until rectification has been completed. 	<ol style="list-style-type: none"> 1. Check inspection report; 2. Check Contractor's working method; 3. Discuss with ET, ER and Contractor on possible remedial measures; 4. Advise ER on effective of proposed remedial measures; and 5. Check implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of non-conformity in writing; 2. Review and agree on the remedial measures proposed by the Contractor; and 3. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Identify source and investigate the non-conformity; 2. Amend working methods agreed with ER as appropriate; and 3. Rectify damage and undertake any necessary replacement.
Limit Level Exceedance	<ol style="list-style-type: none"> 1. Identify sources; 2. Inform the Contractor, IEC and ER; 3. Discuss inspection frequency; 4. Discuss remedial actions with IEC, ER and Contractor; 5. Monitor remedial actions until rectification has been completed; and 6. If non-conformity stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check inspection report; 2. Check Contractor's working method; 3. Discuss with ET, ER and Contractor on possible remedial measures; and 4. Advise ER on effectiveness of proposed remedial measures. 	<ol style="list-style-type: none"> 1. Notify the Contractor; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; and 3. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Identify source and investigate the non-conformity; 2. Implement remedial measures; 3. Amend working methods agreed with ER as appropriate; 4. Rectify damage and undertake any necessary replacement. Stop relevant portion of works as determined by ER until the non-conformity is abated.

Notes:

ET – Environmental Team; IEC – Independent Environmental Checker; ER – Engineer's Representative

Appendix D

Project Implementation Schedule

Environmental Mitigation Implementation Schedule (EMIS)

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
<i>Air Quality</i>							
D1	Dust suppression measures, including watering once per hour, will be incorporated in accordance with the requirements of the Air Pollution Control (Construction Dust) Regulation. Dust filter shall be installed at the ventilation system of the emission source at the tunnel portal chimney. The proposed dust control measures presented in Table 3.11 of the EIA report shall be followed.	Minimize dust impact at the nearby sensitive receivers	Contractor	Tunnel Portal	Construction Phase	<ul style="list-style-type: none"> • Air Pollution Control Ordinance • To control the dust impact to meet HKAQO and EIAO-TM criteria 	Implemented after reminder
D2	<p>The following dust suppression measures should be incorporated into contract document. The standard dust suppression measures as stipulated in the Air Pollution Control (Construction Dust) Regulation to control the dust nuisance shall be implemented throughout the construction phase:</p> <ul style="list-style-type: none"> • The contractor shall observe and comply with Air Pollution Control (Construction Dust) Regulation and implement all the required mitigation measures. • The contractor shall undertake precautions at all times to prevent dust nuisance and smoke as a result of his activities. • The contractor shall ensure a highly efficient dust filter (at least 80% efficiency) to be installed at the ventilation exhaust to treat the exhausting air from cavern. • The contractor shall frequently clean and water the site to minimize fugitive dust emissions. • The contractor shall ensure that there will be adequate water supply/storage for dust suppression. 	Minimize dust impact at the nearby sensitive receivers	Contractor	All Construction sites	Construction Stage	<ul style="list-style-type: none"> • Air Pollution Control Ordinance • To control the dust impact to meet HKAQO and EIAO-TM criteria 	Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	<ul style="list-style-type: none"> The working area of any pavement breaking, excavation or earth moving operation should be sprayed with water immediately before, during and after the operation to avoid dust generation. Any stockpile of dusty material should be properly covered by tarpaulin or other impervious sheeting. Vehicles leaving a site loaded with dusty materials should be covered by tarpaulin or other impervious sheeting. Wheel washing facilities shall be installed and used by all vehicles leaving the site. No earth, mud, debris, dust and the like shall be deposited on public roads. Water in the wheel cleaning facility shall be changed at frequent intervals and sediments shall be removed regularly. The contractor shall submit details of proposals for the wheel cleaning facility. Such wheel washing facilities shall be usable prior to any earthworks excavating activity on the site. The Contractor shall also provide a hard-surfaced road between any washing facility and the public road. Any materials dropped on paved roads shall be cleaned up immediately to prevent dust nuisance. The contractor shall devise, arrange methods of working and carrying out the works in such a manner so as to minimize dust impacts on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these methods are implemented. 						
D3	The contractor shall also implement specific dust mitigation measures for excavation, drilling and blasting activities during the construction of tunnel portal. These include the use of blast nets / canvas covers and ensure portal door is properly closed.	Minimize dust impact at the nearby sensitive receivers	Contractor	All Construction sites	Construction Stage	<ul style="list-style-type: none"> Air Pollution Control Ordinance To control the dust impact to meet 	To be Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
						HKAQO and EIAO-TM criteria	
D4	Before the commencement of any works, the Engineer may require the contractor to submit the methods of working, construction plant or equipment and air pollution control measures to be used on the site to be made available for inspection and approval.	Minimize dust impact at the nearby sensitive receivers	Contractor	All Construction sites	Construction Stage	<ul style="list-style-type: none"> Air Pollution Control Ordinance To control the dust impact to meet HKAQO and EIAO-TM criteria 	Implemented
D5	<p>The following precautionary measures shall be incorporated into contract document and implemented throughout the construction.</p> <ul style="list-style-type: none"> The contractor shall ensure the use of electricity power equipment is connected to the main electricity supply for better emission estimation. The contractor shall avoid the use of diesel power machines and generators as far as practicable. The contractor shall avoid the use of non-road mobile machineries which exempt by the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation, and seek the ones with proper label issued by EPD. The contractor shall observe the requirement of DEVB TC(W) No. 13/2020, to apply a temporary electricity and water supply with a target that the necessary cables/water mains laying works could be completed before the commencement of the works contract. 	Avoid burdening the surrounding NO ₂ concentration	Contractor	All Construction sites	Construction Stage	<ul style="list-style-type: none"> Air Pollution Control Ordinance To control the dust impact to meet HKAQO and EIAO-TM criteria DEVB TC(W) No. 13/2020 	Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
Construction Noise							
N1	The contractor should limit the pipe section to be constructed by open cut method in a length of no more than 30 m at any one time when works are in close proximity to NSRs. Each work front along the proposed watermain laying should be separated by a clearance distance of at least 60 m.	Control construction noise impacts	Contractor	All construction area for watermain laying works	Construction stage	• EIAO-TM	To be implemented
N2	Use of quiet PME is considered to be a practicable means to mitigate the construction noise impact. Quiet plant is defined as a PME having actual SWL lower than the value specified in the GW-TM.	Control construction noise impacts	Contractor	All construction area for watermain laying works	Construction stage	• EIAO-TM • A Practical Guide for the Reduction of Noise from construction works	Implemented
N3	The use of noise barrier for certain PME could generally provide a 5 dB(A) reduction for movable PME and 10 dB(A) for stationary PME. The barrier material shall have a superficial surface density of not less than 10 kg/m ² and have no opening or gaps. Sound absorbent lining inside the enclosure should be at least 25 mm thick.	Control construction noise impacts	Contractor	All construction area for watermain laying works	Construction stage	• EIAO-TM	Implemented
N4	Provision of movable noise barriers of 3m or above in height and with a short-cantilevered section on the top with skid footing should be used and located within a few metres of stationary plant and mobile plant such that the line of sight to the NSR is blocked by the barriers.	Control construction noise impacts	Contractor	All construction area for watermain laying works	Construction stage	• EIAO-TM	To be implemented
N5	Noise enclosure lined with absorptive materials shall be provided at the tunnel portal to mitigate the noise from tunnel/cavern construction. The enclosure is a gap free enclosure with acoustic doors for vehicular access purpose. The acoustic doors shall remain closed throughout the construction period. The sheet material mass of the noise enclosure should be at least 10 kg/m ² and sound-absorbent lining inside the enclosure should be at least 25 mm thick.	Control construction noise impacts	Contractor	Tunnel Portal	Construction stage	• EIAO-TM • A Practical Guide for the Reduction of Noise from construction works	To be implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
N6	Noise barrier/enclosure should be inspected and maintained regularly. The contractor should design and provide details of the temporary noise barriers and noise enclosure to the Engineer for approval.	Control construction noise impacts	Contractor	All Construction sites	Construction stage	• EIAO-TM	Implemented after observation
N7	For NSR5, NSR14, NSR19 and NSR 22, the construction works of Fresh Water/Salt Water Mainlaying (Reinstatement Works) shall be arranged and carried out during School Holidays (i.e., the section of the mainlaying alignment is 20m measured from the school site boundary).	Control construction noise impacts	Contractor	All Construction area for watermain laying works	Construction stage	• EIAO-TM	To be Implemented
N8	During examination period, no mainlaying works will be carried out within 30m (for NSR 14, NSR 19 and NSR 22) or 50m (for NSR 5) from the school site boundary.	Control construction noise impacts	Contractor	All Construction area for watermain laying works	Construction stage	• EIAO-TM	To be Implemented
N9	For NSR13, NSR20 and P1, the concrete lorry mixer shall be located 10 m away from the residential site boundary during the construction works of Fresh Water/Salt Water Mainlaying (Reinstatement Works).	Control construction noise impacts	Contractor	All Construction area for watermain laying works	Construction stage	• EIAO-TM	To be Implemented
N10	<u>Good Site Management Practices</u> <ul style="list-style-type: none"> • Only well-maintained plant should be operated on-site, and plant will be serviced regularly during the construction phase; • Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction phase; • Mobile plant, if any, should be sited away from NSRs; • Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or will be throttled down to a minimum; • Plant known to emit noise strongly in one direction should be orientated so that the noise is directed away from the nearby NSRs; 	Control construction noise impacts	Contractor	All Construction sites	Construction stage	• EIAO-TM	Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	<ul style="list-style-type: none"> Material stockpiles and other structures should be effectively utilised in screening noise from on-site construction activities; The contractor should devise, arrange methods of working and carrying out the works in such manner as to minimise noise impacts on the surrounding environment, and should provide experience personnel with suitable training to ensure that all these measures are implemented properly; and; The contractor should minimise construction noise exposure to the school (especially during examination periods) as much as possible. The contractor should liaise with the school and Examination Authority to ascertain the exact dates and times of all examination periods during the course of the contract and to avoid noisy activities during these periods. 						
Operation Noise							
N11	<ul style="list-style-type: none"> Choose quieter plant; Include noise levels specification when ordering new mechanical equipment such as pumps and ventilation systems; Locate fixed plant, louvres or openings away from NSRs; Locate fixed plant in walled plant rooms or in specially designed enclosures; Ensure pump room doors and tunnel portal doors are kept closed; Silencers, acoustic louvres or acoustic doors should be used where necessary; and Develop and implement a regularly scheduled plant maintenance programme so that equipment is properly 	Reduce the operation noise	Project Proponent	Tunnel Portal / Ancillary building / SRs in carven	Prior to operation of the Project for planned NSRs	<ul style="list-style-type: none"> EIAO-TM 	To be implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	operated and serviced in order to maintain controlled level of noise. The programme should be implemented by properly trained personnel.						
Water Quality (Construction Phase)							
W1	<p>General Construction Site Practice</p> <p>The Contractor should observe and comply with the Water Pollution Control Ordinance and its subsidiary regulations and obtain a discharge license under the Ordinance for discharge of effluent from the construction site. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas should be treated so that it satisfies all the standards listed in the TM-DSS. The Contractor should carry out the Project works in such a manner as to minimise adverse impacts on the water quality during execution of the works. In particular, the Contractor should arrange the working method to minimise the effects on the water quality within and outside the Project Site and on the transport routes. In addition, the management of construction site drainage from the Project will follow guidelines provided in ProPECC PN 1/94 – “Construction Site Drainage”. The mitigation measures described in ETWB TC(W) No. 5/2005 shall also be followed where necessary for construction activities in close vicinity to inland watercourses.</p>	To minimise water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN1/94 • ETWB TC(W) No. 5/2005 • EIAO-TM • TM-DSS 	Implemented
W2	<p>Construction Site Runoff and General Construction Activities</p> <p>Proper site management measures should be implemented to control site runoff and drainage, and thereby prevent high sediment loadings from reaching</p>	To minimize water quality impact from construction site runoff and general	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN1/94 • ETWB TC(W) No. 5/2005 • EIAO-TM 	Implemented after reminder

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	<p>downstream sections of the river/stream. The mitigation measures shall include the following practices:</p> <ul style="list-style-type: none"> • Provision of perimeter channels to intercept storm-runoff from outside the site. These should be constructed in advance of the construction works. • Temporary ditches such as channels, earth bunds or sandbag barriers should be included to facilitate runoff discharge into the stormwater drain, via a sand/silt basin/trap. • Works programme should be designed to minimise works areas at any one time, thus minimizing exposed soil areas and reducing the potential for increased siltation and site runoff. • Sand/silt removal facilities such as sand traps, silt traps and sediment basins should be provided to remove the sand/silt particles from run-off where necessary. These facilities should be properly and regularly cleaned and maintained. These facilities should be carefully planned to ensure that they would be installed at appropriate locations to capture all surface water generated on site. • Careful programming of the works to avoid excavation works during the rainy season (April to September). • Temporary access roads (if any) should be protected by crushed gravel and exposed slope surfaces shall be protected (e.g. by tarpaulin) when rainstorms are likely; • Open stockpiles of construction materials on-site should be covered with tarpaulin or similar fabric during rainstorms to prevent erosion. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system 	<p>construction activities</p>				<ul style="list-style-type: none"> • TM-DSS 	

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	<ul style="list-style-type: none"> • Earthwork final surfaces should be well compacted, and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary. • Measures should be taken to minimise the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities. • Manholes should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system. • Water used in ground boring and drilling for site investigation or rock/soil anchoring should as far as practicable be recirculated after sedimentation. When there is a need for final disposal, the wastewater should be discharged into storm drains via silt removal facilities. • All vehicles and plant should be cleaned before they leave a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. A wheel washing bay should be provided at every site if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road should be 						

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	paved with backfill to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.						
W3	Reuse of treated site runoff shall be considered as far as practicable for onsite activities such as dust suppression, wheel washing and general cleaning, etc.	To minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN1/94 • ETWB TC(W) No. 5/2005 • EIAO-TM • TM-DSS 	N/A
W4	<p><u>Sewage Generated by Construction Workforce</u></p> <p>No discharge of sewage to the storm drains and inland watercourse will be allowed. Domestic sewage /wastewater generated by workforce on-site should be collected in a suitable storage facility such as portable chemical toilets. An adequate number of portable toilets will be provided during the construction phase, with a licensed collector employed to clean the chemical toilets on a regular basis and be responsible for collection and disposal of the sewage. According to the Reference Materials on Construction Site Welfare, Health and Safety Measures that issued by the Construction Industry Council, the number of toilet facilities provided on site shall be at a ratio of not less than one for every 25 workers. These toilets should be maintained in a state that will not deter the workers from using them.</p>	To minimise water quality impact from sewage effluent in construction phase	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN1/94 • ETWB TC(W) No. 5/2005 • EIAO-TM • TM-DSS 	Implemented
W5	<p><u>Accidental Spillage of Chemicals</u></p> <p>The following mitigation measures should be implemented to avoid adverse impacts of chemical spillage:</p>	To prevent water quality impact due to chemical spillage	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • Waste Disposal (Chemical Waste) (General) Regulation • ProPECC PN1/94 	Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	<ul style="list-style-type: none"> Waste streams classifiable as chemical wastes should be properly stored, collected and treated for compliance with the requirements set out in the Waste Disposal Ordinance and its subsidiary Waste Disposal (Chemical Waste) (General) Regulation. All fuel tanks and chemical storage areas should be provided with locks and be sited on paved areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled oil, fuel and chemicals from reaching the receiving waters. Waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance. Vehicle and plant servicing areas, vehicle wash bays and lubrication bays should, as far as possible, be located within roofed areas. The drainage in these covered areas should be connected to foul sewers via a petrol interceptor. 					<ul style="list-style-type: none"> ETWB TC(W) No. 5/2005 EIAO-TM TM-DSS 	
W6	<p><u>Groundwater infiltration and Groundwater Drawdown</u></p> <p>To minimize the groundwater infiltration, the following groundwater control measures are recommended:</p> <ul style="list-style-type: none"> The Contractor shall undertake rigorous probing of the ground ahead of excavation works to identify zones of significant water inflow that could occur as a result of discrete, permeable features. In such zones of significant water inflow, the overall inflow would be reduced by means of cut-off grouting executed ahead of the tunnel/cavern advance. Where water inflow quantities are excessive, pre-grouting will be required to reduce the water inflow into the tunnel/cavern. 	To minimise water quality impact from groundwater infiltration	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance ProPECC PN1/94 ETWB TC(W) No. 5/2005 EIAO-TM TM-DSS 	To be Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	<ul style="list-style-type: none"> In case of excessive infiltration being observed as a result of the tunnelling or excavation works even after pre-grouting measures, post-grouting should be applied as far as practicable. Waterproof lining will be installed after the formation of the tunnels and caverns. In the event of seepage of groundwater occurs, groundwater should be pumped out from works areas and discharged to the storm drains via silt removal facilities. The discharges during construction phase shall comply with WPCO requirements 						
W7	<p><u>Construction Works in Close Proximity of Inland Watercourses</u></p> <p>The mitigation measures proposed for “General Construction Site Practice” and “Construction Site Runoff and General Construction Activities” in Sections 5.8.2 and 5.8.3 of the EIA report shall be implemented properly to minimize the water quality impacts during to the construction works in close proximity of inland watercourse.</p>	To minimise water quality impact from construction site near watercourses	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance ProPECC PN1/94 ETWB TC(W) No. 5/2005 EIAO-TM TM-DSS 	To be Implemented
W8	<p>The practices outlined in ETWB TC(W) No. 5/2005 shall also be adopted where applicable to minimise the water quality impacts upon any natural streams or other inland watercourses. Relevant mitigation measures are listed below:</p> <ul style="list-style-type: none"> The use of less or smaller construction plants may be specified in areas close to the inland watercourses to reduce the disturbance to the surface water. Temporary storage of materials (e.g. equipment, chemicals and fuel) and temporary stockpile of 	To minimise water quality impact from construction site near watercourses	Contractor	The relocated DHSRs	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance ProPECC PN1/94 ETWB TC(W) No. 5/2005 EIAO-TM TM-DSS 	Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	<p>construction debris and spoil should be located well away from any watercourses.</p> <ul style="list-style-type: none"> • Stockpiling of construction materials and dusty materials should be covered and located away from any watercourses. • Construction debris and spoil should be covered up and/or disposed of as soon as possible to avoid being washed into the nearby inland watercourses. • Adequate lateral support may need to be erected in order to prevent soil/mud from slipping into the watercourses. • Construction works close to the inland watercourses should be carried out in dry season as far as practicable where the flow in the surface channel or stream is low. 						
W9	<p><u>Cleansing Effluent Generated from Washing of Interior of Structures</u></p> <p>The cleaning effluent containing SS and residual chlorine should be settled out through the sedimentation tank and dechlorinated by the de-chlorination plant. The discharge quality of the cleansing effluent generated from washing of interior of structures after the construction shall meet the requirements specified in the discharge licence and the cleaning effluent should be treated properly so that it satisfies all the standards listed in the TM-DSS</p>	To minimise water quality impact from construction site effluent	Contractor	The relocated DHSRs	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN1/94 • ETWB TC(W) No. 5/2005 • EIAO-TM • TM-DSS 	To be Implemented
Water Quality (Operation Phase)							
W10	The ProPECC PN 5/93 "Drainage Plans subject to Comments by Environmental Protection Department" provides guidelines and practices for handling, treatment and disposal of various effluent discharges to stormwater drains and foul sewers. The design of site drainage and disposal of various site effluents generated within the	To control operational site effluents	Further Operator	The relocated DHSRs	Operation stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN5/93 	To be Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	development area should follow the relevant guidelines and practices as given in the ProPECC PN 5/93.						
W11	<u>Effluents from Cleaning of Service Reservoir</u> Treatment and disposal of cleansing water during annual cleaning and maintenance of the service reservoirs shall follow the WSD's current normal practice with reference to Sections 23.24 – 23.25 of the General Specification for Civil Engineering Works. Portable water incorporated with a mixture of sterilizing chemicals shall be used for washing water retaining structures. The cleansing effluent shall be settled out through the sedimentation tank and dechlorinated by a dechlorination unit before being discharged to drainage system. Agreement of DSD and discharge license from EPD shall be obtained before commencing any of the discharges during operation phase	To control operational site effluents	Further Operator	The relocated DHSRs	Operation stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance Sections 23.23-23.24 of the General Specification for Civil Engineering Works TM-DSS 	To be Implemented
W12	<u>Non-point Source Surface Runoff</u> Best Management Practices (BMPs) to reduce non-point source surface water pollution are proposed as follows: <ul style="list-style-type: none"> Exposed surface shall be avoided within access road and portal/ancillary building areas to minimise soil erosion. The access road and the portal/ancillary building areas shall be either hard paved or covered by landscaping area where appropriate. Screening facilities such as standard gully grating and trash grille, with spacing which is capable of screening off large substances such as fallen leaves and rubbish should be provided at the inlet of drainage system. Road gullies with standard design and silt traps should be provided to remove particles present in stormwater runoff, where appropriate. Good management measures such as regular cleaning and sweeping of road surface/ open areas are suggested. The road surface/ open area cleaning 	To minimize water quality impact from non-point source surface run-off	Further Operator	The relocated DHSRs	Design and Operation stages	<ul style="list-style-type: none"> Water Pollution Control Ordinance ProPECC PN5/93 	To be Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	<p>should also be carried out prior to occurrence of rainstorm.</p> <ul style="list-style-type: none"> Manholes, as well as storm water gullies, ditches provided at the Project site should be regularly inspected and cleaned (e.g. monthly). Additional inspection and cleansing should be carried out before forecast heavy rainfall. 						
Waste Management (Construction Phase)							
WM1	The waste management hierarchy shall apply to the construction waste management (i.e. in order of desirability: avoidance, minimization, recycling, treatment and safe disposal of waste).	Minimize waste generation during construction	Contractor	All construction sites	Design and Construction stages	<ul style="list-style-type: none"> Waste Disposal Ordinance EIAO 	Implemented
WM2	The contractor should develop and provide toolbox talk for on-site sorting of C&D materials to enhance workers' awareness in handling, sorting, reuse and recycling of C&D materials. Requirements for staff training should be included in the contractor's Environmental Management Plan (EMP). The EMP shall be submitted to the Architect/Engineer for approval before construction works in accordance with ETWB TC(W) No.19/2005.	Minimize waste generation during construction	Contractor	All construction sites	Construction stages	<ul style="list-style-type: none"> Waste Disposal Ordinance EIAO ETWB TC(W) No. 19/2005 DEVB TC(W) No. 6/2010 	Implemented
WM3	Good planning and site management practice should be employed to eliminate over-ordering or mixing of construction materials to reduce wastage. Proper storage and site practices will minimise the damage or contamination of construction materials.	Ensure proper waste management system throughout the construction	Contractor	All construction sites	Construction stages	<ul style="list-style-type: none"> Waste Disposal Ordinance EIAO ETWB TC(W) No. 19/2005 DEVB TC(W) No. 6/2010 	Implemented
WM4	Where waste generation is unavoidable, the potential for recycling or reuse should be rigorously explored. If waste cannot be recycled, disposal routes described in the EMP should be followed. A recording system for the amount of wastes generated, recycled and disposed (including the	Reduce waste generation	Contractor	All Construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal Ordinance EIAO ETWB TC(W) No. 19/2005 	Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	disposal sites) should be implemented. In order to monitor the disposal of C&D material and solid wastes at public filling facilities and landfills and to control fly-tipping, a trip-ticket system should be included. One may make reference to DEVB TC(W) No. 6/2010 for details.					<ul style="list-style-type: none"> • DEVB TC(W) No. 6/2010 	
WM5	Regular cleaning and maintenance of the waste storage area should be provided.	Avoid odour, pest, and litter impacts	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • DEVB TC(W) No.8/2010 • ETWB TC(W) No. 19/2005 	Implemented
WM6	<p><u>Best Management Practice</u></p> <ul style="list-style-type: none"> • An on-site environmental co-ordinator should be identified at the outset of the works. The co-ordinator shall prepare an Environmental Management Plan (EMP) incorporating waste management in accordance with the requirements set out in the ETWB TCW No. 19/2005, Environmental Management on Construction Sites. The EMP shall include monthly and yearly Waste Flow Tables (WFT) that indicate the amounts of waste generated, recycled and disposed of (including final disposal site), and which should be regularly updated. WFT will be provided in the WMP which will form part of the EMP in accordance with ETWB TCW No.19/2005; • The reuse/recycling of all materials on site shall be investigated prior to treatment/ disposal off- site; • Good site practices shall be adopted from the commencement of works to avoid the generation of waste, reduce cross contamination of waste and to promote waste minimisation; • All waste materials shall be sorted onsite into inert and non-inert C&D materials, and where the materials can be recycled or reused, they shall be further segregated. 	Ensure proper waste management system throughout the construction	Contractor	All construction sites	• Construction stage	<ul style="list-style-type: none"> • EIAO • Waste Disposal Ordinance • ETWB TCW No. 19/2005, Environmental Management on Construction Sites • DEVB TCW No.6/2010 • DEVB TCW No. 8/2010 • WBTC No.12/2000 	Implemented after observation

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	<ul style="list-style-type: none"> The contractor shall be responsible for identifying what materials can be recycled/ reused, whether on-site or offsite. In the event of the latter, the contractor shall make arrangements for the collection of the recyclable materials. Any remaining non-inert C&D materials shall be collected and disposed of to the landfills whilst any inert C&D materials shall be re-used on site as far as possible. Alternatively, if inert C&D materials cannot be reused on-site, the materials would be delivered to public fill reception facilities for beneficial reuse after obtaining the appropriate licence; With reference to DEVB TCW No.6/2010, Trip-ticket System for Disposal of Construction and Demolition Material, a trip ticket system should be established at the outset of the construction to monitor the disposal of C&D materials and solid wastes from the site to public filling facilities and landfills; Under the Waste Disposal (Chemical Waste) (General) Regulation, the Contractor shall register as a Chemical Waste Producer if chemical wastes such as spent lubricants and paints are generated on site. Only licensed chemical waste collectors shall be employed to collect any chemical waste generated at site. The handling, storage, transportation and disposal of chemical wastes shall be conducted in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes and A Guide to the Chemical Waste Control Scheme both published by EPD; A sufficient number of covered bins shall be provided on site for the containment of general refuse. These bins shall be cleared daily and the collected waste disposed of to the refuse transfer station. Further to the 						

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	<p>issue of DEVB TCW No. 8/2010, Enhanced Specification for Site Cleanliness and Tidiness, the contractor is required to maintain a clean and hygienic site throughout the Project works;</p> <ul style="list-style-type: none"> • Tool-box talks should be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse, and recycling; and • The contractor shall comply with all relevant statutory requirements and guidelines and their updated versions that may be issued during the course of Project construction. 						
WM7	<p><u>On-site Sorting, Reuse and Recycling</u> All waste materials should be segregated into categories covering:</p> <ul style="list-style-type: none"> • Inert C&D materials suitable for reuse on-site; • Inert C&D materials suitable for public fill reception facilities; • Recyclable C&D materials for recycling; • Remaining C&D materials for landfill; • Chemical waste; and • General refuse for landfill. 	Reduce waste generation	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance • ETWB TCW No. 19/2005, Environmental Management on Construction Sites 	Implemented
WM8	Proper segregation and disposal of construction waste should be implemented. Separate containers should be provided for inert and non-inert materials.	Reduce waste generation	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance • ETWB TCW No. 19/2005, Environmental Management on Construction Sites 	Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
WM9	Specific area should be allocated for on-site sorting of C&D materials and to provide a temporary storage area for those sorted materials. If area is limited, all C&D materials should at least be sorted on-site into inert and non-inert components. Non-inert C&D materials such as bamboo, timber, vegetation, packaging waste and other organic materials should be reused and recycled to local recycler wherever possible and disposed to the designated landfill only as a last resort. Inert C&D materials such as concrete, stone, clay, brick, soil, asphalt and the like should be separated and reused in this or other projects (subject to approval by the relevant parties in accordance with the DEVB TC(W) No. 6/2010) before disposed of at a public filling facility operated by CEDD. Steel and other metals should be recovered from demolition waste stream and recycled	Ensure proper waste management system throughout the construction in order to reduce waste generation	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal Ordinance ETWB TCW No. 19/2005, Environmental Management on Construction Sites DEVB TCW No.6/2010 DEVB TCW No.8/2010 	Implemented
WM10	The reuse of inert C&D materials such as soil, rock and broken concrete should be maximised. Waste should be separated into fine, soft and hard materials. With the use of a crusher, coarse materials can be crushed to make it suitable for use as fill materials where fill is required in the works. This minimises the use of imported materials and maximises the use of the C&D materials produced. Approval from CEDD and EPD shall be obtained for the use of site crusher in accordance with WBTC No. 11/2002.	Ensure proper waste management system throughout the construction in order to reduce waste generation	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal Ordinance WBTC No. 11/2002 	Implemented
WM11	<u>Excavated Materials</u> Excavated materials should be temporarily stored on-site for use as backfill as far as possible. It should be properly covered with tarpaulin or similar impervious sheeting to prevent dust nuisance and site runoff. Surplus excavated materials should be disposed of to public fill reception facilities.	Minimize dust, site runoff and waste impacts from excavated and C&D materials	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal Ordinance Air Pollution Control Ordinance To control the dust impact to meet HKAQO and EIAO-TM criteria 	Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
WM12	Control measures for temporary stockpiles on-site should be taken, which include: <ul style="list-style-type: none"> • Surface of stockpiled soil should be regularly wetted with water especially during dry season; • Disturbance of stockpiled soil should be minimized; • Stockpiled soil should be properly covered with tarpaulin especially when heavy rainstorms are predicted; • Stockpiling areas should be enclosed where space is available; • Stockpiling location should be away from the water bodies; and • An independent surface water drainage system equipped with silt traps should be installed at the stockpiling area. 	Minimize the noise, generation of dust, pollution of water and visual impact from excavated and C&D materials	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance • Air Pollution Control Ordinance • To control the dust impact to meet HKAQO and EIAO-TM criteria. • ETWB TC(W) No.19/2005 	Implemented
WM13	The Public Fill Committee of CEDD should be consulted for disposal of inert C&D materials to public fill reception facilities while EPD should be consulted for disposal of non-inert C&D materials to landfill. Disposal of C&D waste to landfill must not have more than 50% (by weight) inert material. The C&D waste delivered for landfill disposal should contain no free water and the liquid content should not exceed 70% by weight.	Minimise waste impacts from C&D materials	Contractor	All construction sites	Design and Construction stages	<ul style="list-style-type: none"> • Waste Disposal Ordinance • ETWB TCW No. 19/2005, Environmental Management on Construction Sites • DEVB TCW No.6/2010 • DEVB TCW No.8/2010 	Implemented
WM14	In order to avoid dust impacts, any vehicle leaving a works area carrying C&D waste or public fill should have their load covered up before leaving the construction site.	Minimize the dust impact from transferring C&D materials	Contractor	All construction sites	Construction stages	<ul style="list-style-type: none"> • Air Pollution Control Ordinance • ETWB TCW No. 19/2005, Environmental Management on Construction Sites 	Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
						<ul style="list-style-type: none"> • DEVB TCW No.6/2010 • DEVB TCW No.8/2010 	
WM15	C&D materials should be disposed of at designated public fill reception facilities or landfills. Disposal of these materials for the use at other construction projects is subject to the approval of the Engineer and/or other relevant reception authorities. Furthermore, unauthorised disposal of C&D materials in particular on private agricultural land is prohibited and may be subject to relevant enforcement and regulating actions. The disposal of public fill and C&D materials will be controlled through trip-ticket system in accordance with DEVB TC(W) No. 6/2010.	Minimise waste impacts from C&D materials	Contractor	All construction sites	Construction stages	<ul style="list-style-type: none"> • Waste Disposal Ordinance • ETWB TCW No. 19/2005, Environmental Management on Construction Sites • DEVB TCW No.6/2010 • DEVB TCW No.8/2010 	Implemented
WM16	<u>Chemical Waste</u> Where the construction processes produce chemical waste, the contractor must register with EPD as a chemical waste producer. Wastes classified as chemical wastes are listed in the Waste Disposal (Chemical Waste) (General) Regulation. These wastes are subject to stringent disposal routes. EPD requires information on the particulars of the waste generation processes including the types of waste produced, their location, quantities and generation rates. A nominated contact person must be registered with EPD. An updated list of licensed chemical waste collector can be obtained from EPD.	Proper waste management for chemical waste	Contractor / Relevant Operators	All construction sites	Construction stages	<ul style="list-style-type: none"> • Waste Disposal (Chemical Waste) (General) Regulation • Code of Practice on the Packaging Labelling and Storage of Chemical Waste 	Implemented
WM17	Storage, handling, transport, and disposal of chemical waste should be arranged in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published by EPD, and collected by a licensed chemical waste collector.	Proper waste management for chemical waste	Contractor / Relevant Operators	All construction sites	Construction stages	<ul style="list-style-type: none"> • Waste Disposal (Chemical Waste) (General) Regulation • Code of Practice on the Packaging Labelling and 	Implemented after observation

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
						Storage of Chemical Waste	
WM18	Suitable containers should be used for specific types of chemical wastes. The containers should be properly labelled (in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Regulations), resistance to corrosion, stored safely and closely secured. Stored volume should not be kept more than 450 liters unless the specification has been approved by the EPD. Storage area should be enclosed by three sides by a wall, partition of fence that is at least 2 m height or height of tallest container with adequate ventilation and space.	Proper waste management for chemical waste	Contractor / Relevant Operators	All construction sites	Construction stages	<ul style="list-style-type: none"> Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging Labelling and Storage of Chemical Waste 	Implemented
WM19	Hard standing, impermeable surfaces draining via oil interceptors should be provided in works area compounds. Interceptors should be regularly emptied to prevent release of oils and grease into the surface water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain. Oil and fuel bunkers should be bunded and/or enclosed on three sides to prevent discharge due to accidental spillages or breaches of tanks. Bunding should be of sufficient capacity to accommodate 110% of the volume of the largest container or 20% of the total volume of waste, whichever is largest. Waste collected from any oil interceptors should be collected and disposed of by a licensed collector.	Proper waste management for chemical waste	Contractor / Relevant Operators	All construction sites	Construction stages	<ul style="list-style-type: none"> Waste Disposal Ordinance ETWB TCW No. 19/2005, Environmental Management on Construction Sites Waste Disposal (Chemical Waste) (General) Regulation EIAO-TM criteria 	Implemented
WM20	Lubricants, waste oils and other chemical wastes are likely to be generated during the maintenance of vehicles and mechanical equipment. Used lubricants should be collected and stored in individual containers which are fully labelled in English and Chinese and stored in a	Proper waste management for chemical waste	Contractor / Relevant Operators	All construction sites	Construction stages	<ul style="list-style-type: none"> Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging 	Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	designated secure place. The chemical waste shall be collected by licensed chemical waste collectors.					Labelling and Storage of Chemical Waste	
WM21	The registered chemical waste producer (i.e. the contractor) has to arrange for the chemical waste to be collected by licensed collectors. The licensed collector should regularly take chemical waste to a licensed chemical waste treatment facility (such as the CWTC in Tsing Yi). A trip ticket system operates to control the movement of chemical wastes.	Proper waste management for chemical waste	Contractor / Relevant Operators	All construction sites	Construction stages	• Waste Disposal (Chemical Waste) (General) Regulation	Implemented
WM22	No lubricants, oils, solvents or paint products should be allowed to discharge into water courses, either by direct discharge, or as contaminants carried in surface water runoff from the construction site.	Proper waste management for chemical waste	Contractor / Relevant Operators	All construction sites	Construction stages	• Waste Disposal (Chemical Waste) (General) Regulation	Implemented
WM23	<u>General Refuse</u> General refuse should be disposed of to landfill as designated by EPD only after recyclable materials (e.g. paper, metals, aluminium cans, etc.) have been sorted out.	Minimise production of the general refuse and avoid odour, pest and litter impacts	Contractors	All construction sites	Construction stage	• Waste Disposal Ordinance • Public Health and Municipal Services Ordinance (Cap.132)	Implemented
WM24	The contractor should nominate approved site personnel to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility of all wastes generated at the site. Training of site personnel about site cleanliness, proper waste management and chemical handling procedures should be provided. Recyclable materials such as papers and aluminium cans should be separated and delivered to the local recyclers. An adequate number of waste containers should be provided to avoid spillage of waste.	Minimise production of the general refuse and avoid odour, pest and litter impacts	Contractors	All construction sites	Construction stage	• Waste Disposal Ordinance • Public Health and Municipal Services Ordinance (Cap.132)	Implemented
WM25	General refuse generated on-site should be stored in enclosed bins or skips and collected separately from other construction and chemical wastes and disposed of at	Minimise production of the general refuse and	Contractors	All construction sites	Construction stage	• Waste Disposal Ordinance	Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	designated landfills by reputable waste collectors. The removal of waste from the site should be arranged on a daily basis or at least on every second day by the contractor to minimise any potential odour impacts, minimise the presence of pests, vermin and other scavengers and prevent unsightly accumulation of waste.	avoid odour, pest and litter impacts				<ul style="list-style-type: none"> Public Health and Municipal Services Ordinance (Cap.132) 	
Waste Management (Operation Phase)							
WM26	The general refuse and chemical waste generated during the operation phase would follow the same handling procedures and disposal method presented in Sections 6.6.16 to 6.6.25 of the EIA report. It is expected that there would be limited quantities of general refuse and chemical waste to be generated from the operation of the Project and will be properly handled by licensed chemical waste collectors and reputable waste collector. Waste monitoring and audit programme for the operation phase of the Project would not be required.	Minimise production of the general refuse and avoid odour, pest and litter impacts	Relevant Operators	All construction sites	Operation Stage	<ul style="list-style-type: none"> Waste Disposal Ordinance Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging Labelling and Storage of Chemical Waste Public Health and Municipal Services Ordinance (Cap.132) 	To be implemented
Ecology							
E1	Direct impact to the recognised site of conservation importance (Lion Rock Country Park)/habitats with high ecological values (e.g. watercourse, woodland, species of conservation interest shall be avoided.	Avoid any direct impacts to these sites of conservation importance /habitats with high ecological value	Detailed Design Consultant	Sites of conservation importance/ habitats with high ecological value	Design Stage	TM-EIAO	To be implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
E2	To minimise habitat loss to the nearby habitats and associated wildlife, the following mitigation measures should be implemented: <ul style="list-style-type: none"> • Confining the works within the Project Boundary; • Controlling access of site staff to avoid damage to the vegetation in surrounding areas; and • Placement of equipment or stockpile in the existing disturbed / urbanised area within the Project Boundary of the Project to minimise disturbance to vegetated area. 	Minimise habitat loss to the nearby habitats and associated wildlife	Contractor	All construction sites	Construction Stage	TM-EIAO	Implemented
E3	<u>Reinstatement and enhancement of temporarily affected habitats.</u> Minor ecological impacts may arise from the temporary loss of plantation and developed area during construction phase. In general, replanting would be implemented upon the completion of the construction works to reinstate the temporarily affected areas to condition similar to original status.	Enhance the temporarily affected habitats	Contractor	All construction sites	Construction stage	TM-EIAO	To be implemented
E4	<u>Minimizing Disturbance from Construction Activities</u> Mitigation measures including, but not limited to, erection of site hoarding, use of Quality Powered Mechanical Equipment (QPME), noise and dust reduction tarpaulin sheeting and good site practices throughout construction phase are shown as followings: <ul style="list-style-type: none"> • Site hoarding would be established around the proposed tunnel portal and E&M building prior to the commencement of construction works to prevent construction activities from encroaching adjacent habitats as well as prevent unnecessary human activities in the surrounding habitats; • QPME, noise and dust reduction tarpaulin sheeting could be used during construction phase to reduce noise disturbance and dust emission. Temporary 	To minimise disturbance from construction activities	Contractor	All construction sites	Construction stage	TM-EIAO	Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	<p>barriers such as movable noise barrier, temporary noise screening structures and site hoardings could further reduce the noise impact;</p> <ul style="list-style-type: none"> • Good site practices such as regular water spraying at dusty operation, provision of waste skips and timely collection of general refuse and construction waste are also recommended. 						
E5	Reduction of lighting can be achieved using directional lighting to prevent excessive light spill into adjacent natural habitat and disturbance to nocturnal fauna. .	To minimize disturbance from construction activities	Contractor	All construction sites	Construction stage	TM-EIAO	Implemented
E6	<p><u>Control of Site Runoff</u> Best management practices should be implemented on site in accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN 1/94) as far as practicable to control site runoff and drainage at all work sites during construction phase, so that the treated runoff will be discharged to public drainage system in compliance with the WPCO. Construction effluent, site run-off and sewage should be properly collected and/or treated. Wastewater from a construction site should be managed. Proper locations for discharge outlets of wastewater treatment facilities well away from the natural watercourses should be identified. Effluent monitoring should be incorporated to make sure that the discharged effluent from construction sites meets the effluent discharge guidelines. The practices outlined in ETWB TC (Works) No. 5/2005 “Protection of natural streams/rivers from adverse impacts arising from construction works” should also be adopted where applicable to minimise the water quality impacts upon the channalised/semi-natural</p>	To control site runoff and drainage at all work sites, thus, the aquatic ecosystem is protected.	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN. 1/94 	Implemented after reminder

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	watercourses, in order to better protect the aquatic ecosystem.						
E7	<u>Control of Groundwater Infiltration</u> In order to minimise groundwater infiltration or avoid potential impacts on watercourses, water table and groundwater drawdown, minimization approach was adopted during design stage and would be adopted during construction and operation phase.	To minimize groundwater infiltration / avoid potential impacts on watercourses	Contractor	Works area at Cavern and tunnel portal	Design stage / Construction stage / Operation Stage	EIAO-TM	To be implemented
E8	The proposed cavern would be constructed under the measured groundwater table. Water inflow would be controlled to an acceptable level by implementing pre-grouting and post-grouting measures, thus the impact of the proposed cavern on the groundwater table is considered to be limited.	To minimize groundwater infiltration / avoid potential impacts on watercourses	Contractor	Works area at Cavern and tunnel portal	Design stage / Construction stage / Operation Stage	EIAO-TM	To be implemented
E9	The permanent tunnel structure of the proposed access tunnel would be designed as drained type at the locations with adequate rock cover and designed as undrained type at locations with mix ground conditions. The water inflow would also be controlled to an acceptable level with pre-grouting and postgrouting measures.	To minimize groundwater infiltration / avoid potential impacts on watercourses	Contractor	Works area at Cavern and tunnel portal	Design stage / Construction stage / Operation Stage	EIAO-TM	To be implemented
E10	During operation phase, waterproof lining would be installed to prevent water seepage and water droplets (if any) would be discharged into the sewage system	To minimize groundwater infiltration / avoid potential impacts on watercourses	Contractor	Works area at Cavern and tunnel portal	Design stage / Construction stage / Operation Stage	EIAO-TM	To be implemented
E11	All the mitigation measures regarding potential groundwater infiltration concern that has been proposed in Section 5.8.7 shall be followed.	To minimize groundwater infiltration / avoid potential impacts on watercourses	Contractor	Works area at Cavern and tunnel portal	Design stage / Construction stage / Operation Stage	EIAO-TM	To be implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
<i>Landscape and Visual (Construction Phase)</i>							
CM1	<u>Careful Site Planning and Management</u> <ul style="list-style-type: none"> The site layout and works area including temporary access road(s), stockpiling area(s), temporary construction storage shall be carefully planned to preserve existing landscape resources and trees as far as practicable. Good site practices shall be enforced to eliminate eyesores from unappealing stockpiling/ storage areas and/or construction activities. 	To minimize site clearance, tree removal and disturbance to existing Landscape Resources, and visual obstruction to VSRs	Project Proponent (via Contractor)	All construction areas	Construction stage	N/A	Implemented
CM2	<u>Careful Design of Slope Works</u> <ul style="list-style-type: none"> Slope stabilization methods (i.e., insertion of soil nails and establishment of grillage, etc.) shall be carefully formulated to minimise the loss of tree and landscape cover as far as practicable. 	To minimize tree removal and to create a slope surface better blending with the surrounding environment	Project Proponent (via Contractor)	Works area at Cavern and tunnel portal	Construction stage	N/A	Implemented
CM3	<u>Tree Preservation</u> <ul style="list-style-type: none"> In accordance with DEVB TC (W) No.4/2020 – Tree Preservation or its latest version, existing vegetation shall be retained on site as far as practicable. Adequate tree protection measures shall be provided for the Trees to be retained on site. Relevant guidelines on tree care and protection promulgated by Greening, Landscape and Tree Management Section of Development Bureau shall be observed and followed. 	To minimize tree removal	Project Proponent (via Contractor)	All construction areas	Construction stage	N/A	Implemented
CM4	<u>Tree Transplanting/ Compensatory Tree Planting</u> <ul style="list-style-type: none"> Trees unavoidably affected by the project shall be transplanted as far as practicable in accordance with DEVB TC (W) No.4/2020 – Tree Preservation or its latest version and the latest guidelines promulgated by 	To minimize the loss of trees To compensate for the loss of tree	Project Proponent (via Contractor)	All construction areas	Construction stage	DEVB TC(W) No. 4/2020- Tree Reservation	Implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
	<p>Greening, Landscape and Tree Management Section of Development Bureau.</p> <ul style="list-style-type: none"> Affected trees that are not suitable for transplantation and to be felled shall be compensated in not less than 1:1 in quantity and in accordance with DEVB TC (W) No.4/2020 – Tree Preservation or its latest version. Onsite compensation has been prioritized. However, due to land status issues, area of onsite compensatory planting locations are insufficient to compensate for the loss of trees and near site compensatory locations managed by WSD are adopted, as shown in Figure 9.9, Figure 9.10A, Figure 9.10B and Figure 9.11 of the EIA report. Tree species selected shall be compatible with surrounding existing vegetation. 	To provide quality and sustainable landscape that is compatible with the site context					
CM5	<p><u>Inspection of Tree Works</u></p> <ul style="list-style-type: none"> Regular site inspection shall be conducted by tree specialist. 	To closely monitor the site activities in order to avoid or minimize any possible adverse impact to the retained trees	Project Proponent (via Contractor)	All construction areas	Construction stage	N/A	Implemented
CM6	<p><u>Minimization of Light Impact</u></p> <ul style="list-style-type: none"> Lighting at construction sites shall be carefully controlled at night 	To avoid disturbance to nearby VSRs	Project Proponent (via Contractor)	All construction areas and temporary works areas	Construction stage	N/A	Implemented
CM7	<p><u>Erection of Decorative Site Hoarding</u></p> <ul style="list-style-type: none"> Decorative hoarding that is compatible with the surrounding environment shall be erected during construction. 	To enhance the visual amenity of construction hoarding	Project Proponent (via Contractor)	All construction areas and temporary work areas	Construction stage	N/A	To be implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
CM8	<u>Reinstatement of Temporarily Disturbed Areas</u> • Temporarily disturbed landscape areas shall be reinstated.	To reinstate the disturbed landscape	Project Proponent (via Contractor)	All construction areas and temporary work areas	Construction stage	N/A	To be implemented
<i>Landscape and Visual (Operation Phase)</i>							
OM1	<u>Landscape Planting</u> • Landscape planting shall be provided in accordance with DEVB TCW No.3/2012 – Site Coverage of Greenery for Government Building Projects or its latest version. • Planting species shall be compatible with the nearby existing vegetation cover as far as practicable. • Not less than 12-month establishment after completion shall be provided for the landscape planting.	To soften the hard edges of the structure and make it more compatible with the surrounding environment	Project Proponent (via Contractor)	Ancillary building	Operation stage	DEVB TCW No.3/2012	To be implemented
OM2	<u>Rooftop Greening</u> Rooftop greening shall be implemented with reference to the references on skysrise greenery provided by the Greening, Landscape & Tree Management Section, Development Bureau.	To make the ancillary facilities more compatible with the surrounding woodland landscape and to mitigate the potential adverse visual impact on adjacent residential VSRs viewing from an elevated vantage point	Project Proponent (via Contractor)	Ancillary building	Operation stage	N/A	To be implemented
OM3	<u>Vertical Greening</u> Vertical greening shall be provided.	To enhance the visual amenity of the ancillary	Project Proponent	Ancillary building	Operation stage	N/A	To be implemented

EM&A Log Ref.	Recommended Mitigation Measures	Objective of the recommended measure & main concerns to address	Implement Agent	Location / Timing	Implementation Timing	Requirements and / or Standards to be Achieved	Implementation status
		facilities and to blend in with the surrounding landscape	(via Contractor)				
OM4	<u>Careful Design of Ancillary Facilities</u> <ul style="list-style-type: none"> The orientation and location of the ancillary facilities shall be carefully designed. Its finish shall be non-reflective and dull in colour. The ancillary facilities are unmanned structures that merely require minimal security services during daytime. There shall be nobody and no lighting illuminating from the buildings at night, except essential street lighting for the portal access road. 	To avoid glare impact to surrounding VSRs	Project Proponent (via Contractor)	Ancillary building	Operation stage	N/A	To be implemented

Appendix E

Air Quality and Noise Monitoring Equipment Calibration Certification

Sibata LD-5R K-Factor Verification Test by Total Suspended Particulates HVS Test Report

Information of Calibrated Equipment

Verification Test Date:	1-Mar-23	to	2-Mar-23	Next Verification Test Date:	1-Mar-24
Unit-under-Test- Model No.:	Sibata LD-5R				
Unit-under-Test Serial No.:	0Z4545				
Our Report Reference No.:	RPT-23-HVS-0002				
Calibration Location:	Emax				

Standard Equipment Information

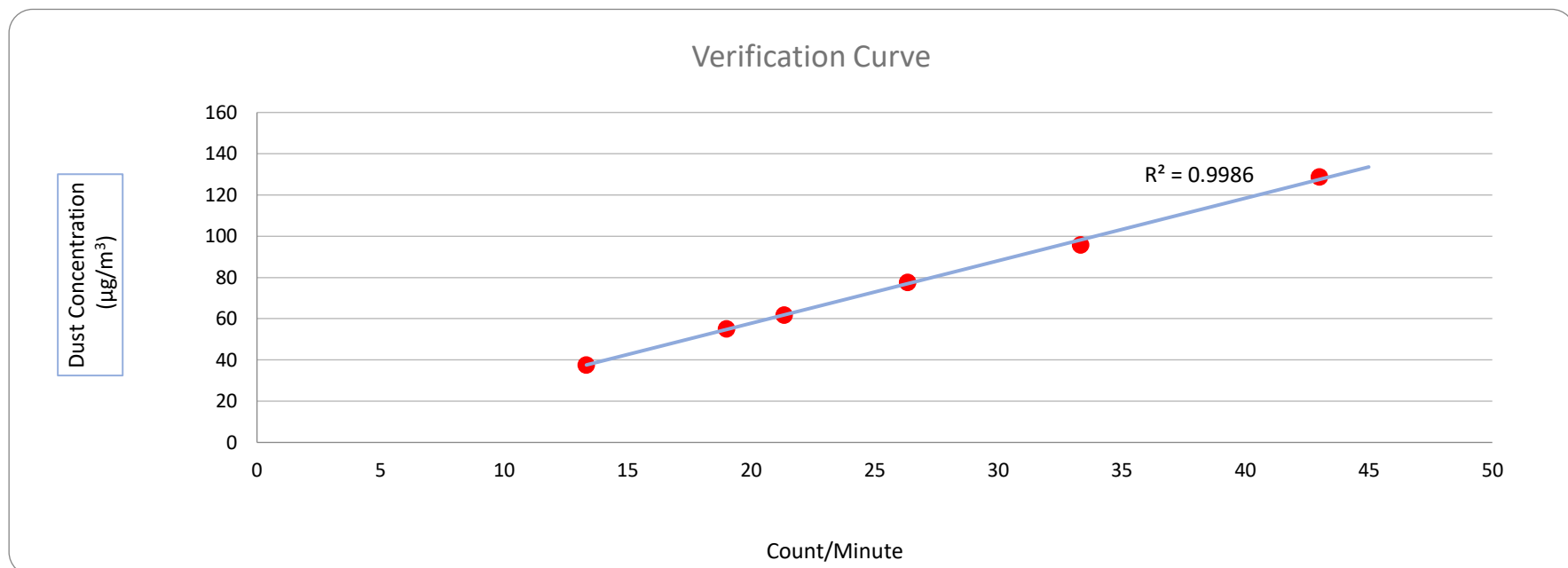
Verification Equipment Type:	Tisch TSP HVS	Tisch HVS Calibrator
Standard Equipment Model No.:	TE-5170X	TE-5025A
Equipment serial no.:	1086	3465
Last Calibration Date:	1-Mar-23	28-Jun-22
Next Calibration Date:	30-Apr-23	27-Jun-23

Equipment Verification Result

Verification Test No.	Date	Duration			Results from Calibrated Equipment		Results from Standard Equipment
		Start-time	End-time	Elapsed Time (in min)	Total Counts	Counts/ Minute x-axis	Dust Concentration ($\mu\text{g}/\text{m}^3$) y-axis
1	1/3/2023	5013.27	5016.34	184.20	4851	26	78
2	1/3/2023	5016.34	5019.34	180.00	6000	33	96
3	1/3/2023	5019.34	5022.34	180.00	7740	43	129
4	2/3/2023	5022.34	5025.34	180.00	3840	21	62
5	2/3/2023	5025.34	5028.34	180.00	2400	13	38
6	2/3/2023	5028.34	5031.34	180.00	3420	19	55

Linear Regression of y on x

Slope, K factor:	3.0313	Intercept:	-2.8495	*Correlation Coefficient, R:	0.9993
Verification Test Result: <u>Strong Correlation, Results were accepted.</u>				* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.	



Operated By: Andy Li
Project Technician, Environmental

Date: 01-03-2023

Checked By: Tandy Tse
Senior Consultant, Environmental

Date: 01-03-2023

Sibata LD-5R K-Factor Verification Test by Total Suspended Particulates HVS Test Report

Information of Calibrated Equipment

Verification Test Date:	1-Mar-23	to	2-Mar-23	Next Verification Test Date:	1-Mar-24
Unit-under-Test- Model No.:	Sibata LD-5R				
Unit-under-Test Serial No.:	942532				
Our Report Reference No.:	RPT-23-HVS-0005				
Calibration Location:	Emax				

Standard Equipment Information

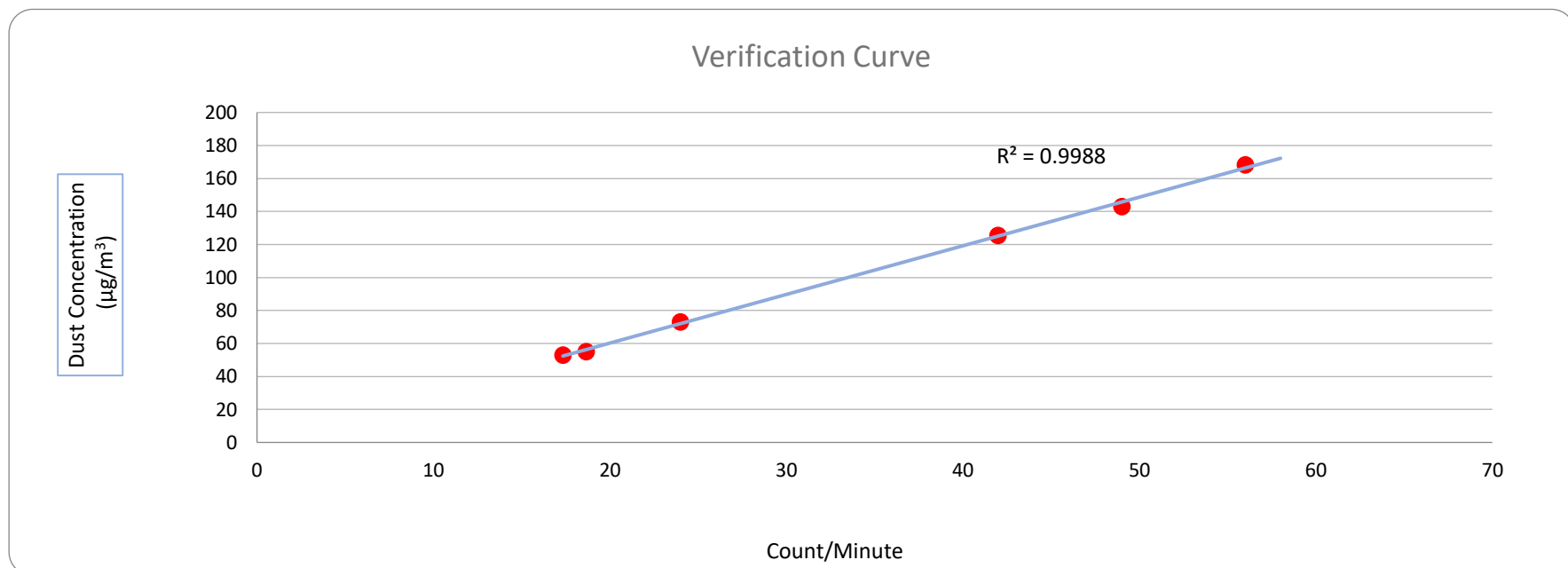
Verification Equipment Type:	Tisch TSP HVS	Tisch HVS Calibrator
Standard Equipment Model No.:	TE-5170X	TE-5025A
Equipment Serial no.:	1855	3465
Last Calibration Date:	1-Mar-23	28-Jun-22
Next Calibration Date:	30-Apr-23	27-Jun-23

Equipment Verification Result

Verification Test No.	Date	Duration			Results from Calibrated Equipment		Results from Standard Equipment
		Start-time	End-time	Elapsed Time (in min)	Total Counts	Counts/ Minute x-axis	Dust Concentration (µg/m ³) y-axis
1	1/3/2023	5013.27	5016.34	184.20	7736	42	125
2	1/3/2023	5016.34	5019.34	180.00	8820	49	143
3	1/3/2023	5019.34	5022.34	180.00	10080	56	168
4	2/3/2023	5022.34	5025.34	180.00	3120	17	53
5	2/3/2023	5025.34	5028.34	180.00	3360	19	55
6	2/3/2023	5028.34	5031.34	180.00	4320	24	73

Linear Regression of y on x

Slope, K factor:	2.9474	Intercept:	1.2739	*Correlation Coefficient, R:	0.9994
Verification Test Result: <u>Strong Correlation, Results were accepted.</u>			* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.		



Operated By: Andy Li
Project Technician, Environmental

Date: 01-03-2023

Checked By: Tandy Tse
Senior Consultant, Environmental

Date: 01-03-2023

Sibata LD-5R K-Factor Verification Test by Total Suspended Particulates HVS Test Report

Information of Calibrated Equipment

Verification Test Date:	1-Mar-23	to	2-Mar-23	Next Verification Test Date:	1-Mar-24
Unit-under-Test- Model No.:	Sibata LD-5R				
Unit-under-Test Serial No.:	882106				
Our Report Reference No.:	RPT-23-HVS-0008				
Calibration Location:	Emax				

Standard Equipment Information

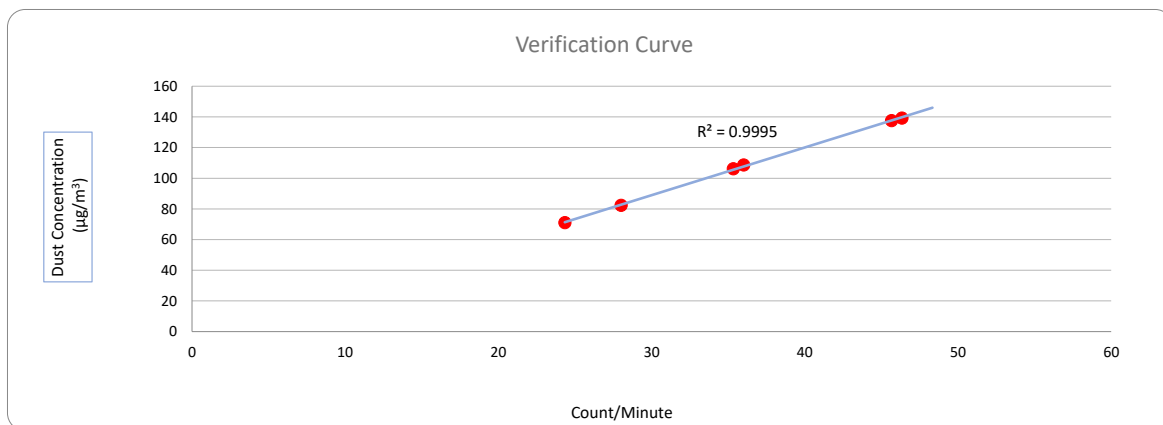
Verification Equipment Type:	Tisch TSP HVS	Tisch HVS Calibrator
Standard Equipment Model No.:	TE-5170X	TE-5025A
Equipment Serial no.:	1087	3465
Last Calibration Date:	1-Mar-23	28-Jun-22
Next Calibration Date:	30-Apr-23	27-Jun-23

Equipment Verification Result

Verification Test No.	Date	Duration			Results from Calibrated Equipment		Results from Standard Equipment
		Start-time	End-time	Elapsed Time (in min)	Total Counts	Counts/ Minute x-axis	Dust Concentration ($\mu\text{g}/\text{m}^3$) y-axis
1	1/3/2023	5013.27	5016.34	184.20	8535	46	139
2	1/3/2023	5016.34	5019.34	180.00	6480	36	109
3	1/3/2023	5019.34	5022.34	180.00	8220	46	137
4	2/3/2023	5022.34	5025.34	180.00	5040	28	82
5	2/3/2023	5025.34	5028.34	180.00	4380	24	71
6	2/3/2023	5028.34	5031.34	180.00	6360	35	106

Linear Regression of y on x

Slope, K factor:	<u>3.1109</u>	Intercept:	<u>-4.3817</u>	*Correlation Coefficient, R:	<u>0.9998</u>
Verification Test Result: <u>Strong Correlation, Results were accepted.</u>			* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.		



Operated By: Andy Li
Project Technician, Environmental

Date: 05-03-2023

Checked By: Tandy Tse
Senior Consultant, Environmental

Date: 05-03-2023



CALIBRATION CERTIFICATE

Product : SOUND CALIBRATOR
Type : NC-75
Serial number : 35124527
Manufacturer : RION CO., LTD.
Calibration quantities : Sound pressure level (with reference standard microphone)
Calibration method : Measured by specified secondary standard microphone
according to JCSS calibration procedure specified by RION.
Ambient conditions : Temperature 23.9 °C, Relative humidity 49 %,
Static pressure 100.6 kPa
Calibration date : 02/11/2022 (DD/MM/YYYY)
Calibration location : 3-20-41 Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan
RION CO., LTD. Calibration Room

We hereby certify that the results of this calibration were as follows.

Issue date : 09/11/2022 (DD/MM/YYYY)

Junichi Kawamura
Manager
Quality Assurance Section,
Quality Assurance Department,
Environmental Instrument Division,
RION CO., LTD.
3-20-41 Higashimotomachi, Kokubunji,
Tokyo 185-8533, Japan



This certificate is based on article 144 of the Measurement Law and indicates the result of calibration in accordance with measurement standards traceable to Primary Measurement Standards (National Standards) which realizes the physical units of measurement according to the International System of Units (SI).

The accreditation symbol is attestation of which the result of calibration is traceable to Primary Measurement Standards (National Standards).

The certificate shall not be reproduced except in full, without the written approval of the issuing laboratory.

The calibration laboratory who issued this calibration certificate conforms to ISO/IEC 17025:2017.

This calibration certificate was issued by the calibration laboratory accredited by IA Japan who is a signatory to the Mutual Recognition Arrangement (MRA) of International Laboratory Accreditation Cooperation (ILAC) and Asia Pacific Accreditation Cooperation (APAC). This (These) calibration result(s) may be accepted internationally through ILAC/APAC MRA.

CALIBRATION RESULT

1. Sound pressure level (with reference standard microphone)

Measured value	Expanded uncertainty *1
93.99 dB	0.09 dB

Specified secondary standard microphone:

Type : 4160
 Serial number : 2973341
 Reference Sound pressure : 2×10^{-5} Pa

*1 Defines an interval estimated to have a level of confidence of approximately 95 %.

Coverage factor $k=2$

Calibration result is the calibration value in ambient conditions during calibration.

BE OUT OF JCSS CALIBRATION

1. Frequency

Measured value	Measurement uncertainty ($k=2$)
1000.0 Hz	2.7×10^{-4} Hz

Working measurement standard universal counter:

Type : 53132A
 Serial number : MY40005574
 (JCSS Calibration Certificate No. 2208001889940)

2. Total distortion

Measured value
0.2 %

Working measurement standard distortion meter:

Type : VA-2230A
 Serial number : 11076061
 (A2LA Calibration Certificate No. 1502-03109)

- closing -

Certificate of Calibration

for

Description: *Sound Level Meter*
Manufacturer: *NTi Audio*
Type No.: *XL2 (Serial No.: A2A-13661-E0)*
Microphone: *ACO 7052 (Serial No.:68914)*
Preamplifier: *NTi Audio MA220 (M2211) (Serial No.:6282)*

Submitted by:

Customer: *Acuity Sustainability Consulting Limited*
Address: *Unit E, 12/F., Ford Glory Plaza,
Nos. 37-39 Wing Hong Street,
Cheung Sha Wan, Kowloon, Hong Kong*

Upon receipt for calibration, the instrument was found to be:

- Within (31.5Hz – 8kHz)**
 Outside

the allowable tolerance.

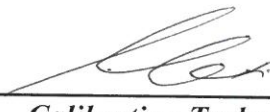
The test equipment used for calibration are traceable to National Standards via:

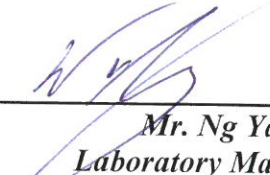
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

Date of receipt: 20 August 2022

Date of calibration: 22 August 2022

Date of NEXT calibration: 21 August 2023

Calibrated by: 
Calibration Technician

Certified by: 
Mr. Ng Yan Wa
Laboratory Manager

Date of issue: 22 August 2022

Certificate No.: APJ22-071-CC001



Page 1 of 4

1. Calibration Precaution:

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.

2. Calibration Conditions:

Air Temperature: 23.4 °C
 Air Pressure: 1005 hPa
 Relative Humidity: 68.5 %

3. Calibration Equipment:

	Type	Serial No.	Calibration Report Number	Traceable to
Multifunction Calibrator	B&K 4226	2288467	AV220061	HOKLAS

4. Calibration Results

Sound Pressure Level

Reference Sound Pressure Level

Setting of Unit-under-test (UUT)				Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz			
30-130	dBA SPL	Fast	94	1000	93.8	±0.4	

Linearity

Setting of Unit-under-test (UUT)				Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz			
30-130	dBA SPL	Fast	94	1000	93.8	Ref	
			104		103.8	±0.3	
			114		114.0	±0.3	

Time Weighting

Setting of Unit-under-test (UUT)				Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz			
30-130	dBA SPL	Fast	94	1000	93.8	Ref	
		Slow			93.8	±0.3	

Frequency Response

Linear Response

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB	
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz			
30-130	dB	SPL	Fast	94	31.5	93.9	±2.0
					63	94.0	±1.5
					125	93.9	±1.5
					250	93.8	±1.4
					500	93.8	±1.4
					1000	93.8	Ref
					2000	93.4	±1.6
					4000	93.0	±1.6
					8000	92.2	+2.1; -3.1

A-weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB	
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz			
30-130	dBA	SPL	Fast	94	31.5	54.6	-39.4 ±2.0
					63	67.7	-26.2 ±1.5
					125	77.8	-16.1 ±1.5
					250	85.2	-8.6 ±1.4
					500	90.6	-3.2 ±1.4
					1000	93.8	Ref
					2000	94.6	+1.2 ±1.6
					4000	94.0	+1.0 ±1.6
					8000	91.2	-1.1 ±2.1; -3.1

C-weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB	
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz			
30-130	dBC	SPL	Fast	94	31.5	90.9	-3.0 ±2.0
					63	93.1	-0.8 ±1.5
					125	93.7	-0.2 ±1.5
					250	93.8	-0.0 ±1.4
					500	93.8	-0.0 ±1.4
					1000	93.8	Ref
					2000	93.3	-0.2 ±1.6
					4000	92.2	-0.8 ±1.6
					8000	89.3	-3.0 ±2.1; -3.1

5. Calibration Results Applied

The results apply to the particular unit-under-test only. All calibration points are within manufacture's specification as IEC 61672 Class 1.

Uncertainties of Applied Value:

94 dB	31.5 Hz	± 0.10
	63 Hz	± 0.10
	125 Hz	± 0.05
	250 Hz	± 0.05
	500 Hz	± 0.05
	1000 Hz	± 0.05
	2000 Hz	± 0.05
	4000 Hz	± 0.05
	8000 Hz	± 0.10
104 dB	1000 Hz	± 0.05
114 dB	1000 Hz	± 0.05

The uncertainties are evaluated for a 95% confidence level.

Note:

The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. (A+A)*L shall not be liable for any loss or damage resulting from the use of the equipment.

Manufacturer Calibration Certificate

The following instrument has been tested and calibrated to the manufacturer specifications.
The calibration is traceable in accordance with ISO/IEC 17025 covering all instrument functions.

- Device Type: **XL2 Audio and Acoustic Analyzer**
- Serial Number: **A2A-13663-F0**

- Certificate Issued: **15 February 2023**
- Certificate Number: **44972-A2A-13663-F0**

- Results: **PASSED**
(for detailed report see next page)

Tested by:

M. Frick

Signature:

Stamp:



NTi Audio AG
Im alten Riet 102
LI - 0494 Schaan
www.nti-audio.com

Calibration of: XL2 Audio and Acoustic Analyzer
 Serial Number: A2A-13663-F0
 Date: 15 February 2023

• Detailed Calibration Test Results:

	reference	actual	unit	actual error	XL2 tolerance	calibration uncertainty ²
RMS Level @ 1kHz, XLR Input	0.1	0.100	V	≤0.1%	±0.5%	±0.10%
	1	0.999	V	-0.1%	±0.5%	±0.09%
	10	9.982	V	-0.2%	±0.5%	±0.09%
Flatness, XLR Input ¹	20 Hz	0.995	V	-0.5%	±1.1%	±0.09%
	20 kHz	1.003	V	0.3%	±1.1%	±0.09%
Frequency	1000	1000.00	Hz	≤0.003%	±0.003%	±0.01%
Residual Noise	XLR	< 2 uV			<2 uV	±0.50%
THD+N @ 0 dBu, 1 kHz, XLR Input		-100.5	dB		typ. -100 dB	±0.50%

- Test Conditions:
 - Temperature: **24.9** °C
 - Relative Humidity: **19.8** %

• Calibration Equipment Used:

- Agilent Multimeter, Typ 34401A, Serial No. MY 5300 4607
 Last calibration: 15.09.2022, Next calibration: 15.09.2023
 Calibrated by ELCAL to the national standards maintained at Swiss Federal Office of Metrology. SCS 0002
- FX100 Audio Analyzer, Serial No. 10408
 Last Calibration: 11.10.2022, Next Calibration: 11.10.2023
 Manufacturer calibration based on Agilent 34410, Serial No. MY47014254,
 Last Calibration: 26.05.2022, Next Calibration: 26.05.2023
 which is calibrated by ELCAL to national standards maintained at Swiss Federal Office of Metrology. SCS 002

¹ The specified tolerance +/-0.1 dB @ 1V = +/- 1.1%

² The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with the regulations of the GUM.

Appendix F

Environmental Monitoring Schedule

Contract No. 21/WSD/21
Relocation of Diamond Hill Fresh Water and Salt Water Service Reservoirs to Caverns

Impact Environmental Monitoring Schedule (Version 2.0)

August 2023

Sun	Mon	Tue	Wed	Thur	Fri	Sat
		1	2	3 Impact Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4, DM-4a, NM-2, NM-3, NM-4, NM-4a) Site Inspection	4	5
6	7	8	9 Impact Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4, DM-4a, NM-2, NM-3, NM-4, NM-4a)	10	11 Site inspection	12
13	14	15 Impact Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4, DM-4a, NM-2, NM-3, NM-4, NM-4a) Site inspection	16	17	18	19
20	21 Impact Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4, DM-4a, NM-2, NM-3, NM-4, NM-4a)	22	23	24	25 Site inspection	26 Impact Air Quality Monitoring (DM-1, DM-2, DM-3, DM-4, DM-4a)
27	28	29	30	31 Site inspection	1	2

Air Quality Monitoring Stations:

DM-1 - Tennis Court near Tin Ma Court
DM-2 - Chun Sing House, Tin Ma Court
DM-3 - Grace Methodist Church Kindergarten
DM-4 - Block 6, Tsui Chuk Garden
DM-4a - Road pavement near Wang King House, Tin Wang Court

Noise Monitoring Stations:

NM-2 - Chun Sing House, Tin Ma Court
NM-3 - Grace Methodist Church Kindergarten
NM-4 - Block 6, Tsui Chuk Garden
NM-4a - Road pavement near Wang King House, Tin Wang Court

Relocation of Diamond Hill Fresh Water and Salt Water Service Reservoirs to Caverns

Tentative Impact Environmental Monitoring Schedule (Version 2.0)						
September 2023						
Sun	Mon	Tue	Wed	Thur	Fri	Sat
					1	2
3	4 Impact Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4, DM-4a, NM-2, NM-3, NM-4, NM-4a, NM-5, NM-6)	5	6	7 Impact Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4, DM-4a, NM-2, NM-3, NM-4, NM-4a, NM-5, NM-6)	8 Site inspection	9
10	11	12	13 Impact Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4, DM-4a, NM-2, NM-3, NM-4, NM-4a, NM-5, NM-6) Site inspection	14	15	16
17	18	19 Impact Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4, DM-4a, NM-2, NM-3, NM-4, NM-4a, NM-5, NM-6)	20	21	22 Site inspection	23
24	25 Impact Air Quality and Noise Monitoring (DM-1, DM-2, DM-3, DM-4, DM-4a, NM-2, NM-3, NM-4, NM-4a, NM-5, NM-6)	26	27	28	29 Impact Air Quality Monitoring (DM-1, DM-2, DM-3, DM-4, DM-4a) Site inspection	30
The schedule may be changed due to unforeseen circumstances (e.g. adverse weather, etc.)						
Air Quality Monitoring Stations: DM-1 - Tennis Court near Tin Ma Court DM-2 - Chun Sing House, Tin Ma Court DM-3 - Grace Methodist Church Kindergarten DM-4 - Block 6, Tsui Chuk Garden DM-4a - Road pavement near Wang King House, Tin Wang Court				Noise Monitoring Stations: NM-2 - Chun Sing House, Tin Ma Court NM-3 - Grace Methodist Church Kindergarten NM-4 - Block 6, Tsui Chuk Garden NM-4a - Road pavement near Wang King House, Tin Wang Court NM-5 - Wo Tin House, Shatin Pass Estate NM-6 - Sheung Fung Street Customs Staff Quarters		

Appendix G

Air Quality Monitoring Results and Graphical Presentation

Appendix G - 1-hour TSP Monitoring Results

DM-1 - Tennis Court near Tin Ma Court			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
3 Aug 2023	15:00	Sunny	45
	16:00		49
	17:00		46
9 Aug 2023	9:50	Sunny	15
	10:50		20
	11:50		16
15 Aug 2023	13:00	Sunny	53
	14:00		56
	15:00		51
21 Aug 2023	13:06	Sunny	51
	14:06		58
	15:06		53
26 Aug 2023	14:30	Sunny	59
	15:30		61
	16:30		58
Minimum			15
Maximum			61
Average			46

DM-2 - Chun Sing House, Tin Ma Court			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
3 Aug 2023	10:06	Sunny	50
	11:06		53
	12:06		50
9 Aug 2023	14:50	Sunny	28
	15:50		30
	16:50		25
15 Aug 2023	9:40	Sunny	53
	10:40		55
	11:40		52
21 Aug 2023	9:06	Sunny	59
	10:06		61
	11:06		62
26 Aug 2023	11:00	Sunny	60
	12:00		61
	13:00		58
Minimum			25
Maximum			62
Average			50

Appendix G - 1-hour TSP Monitoring Results

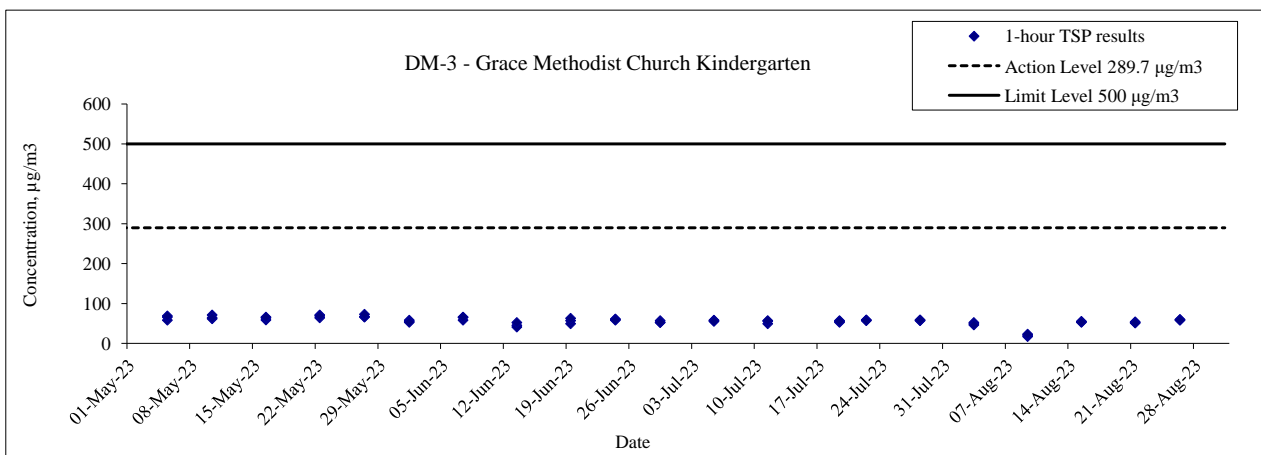
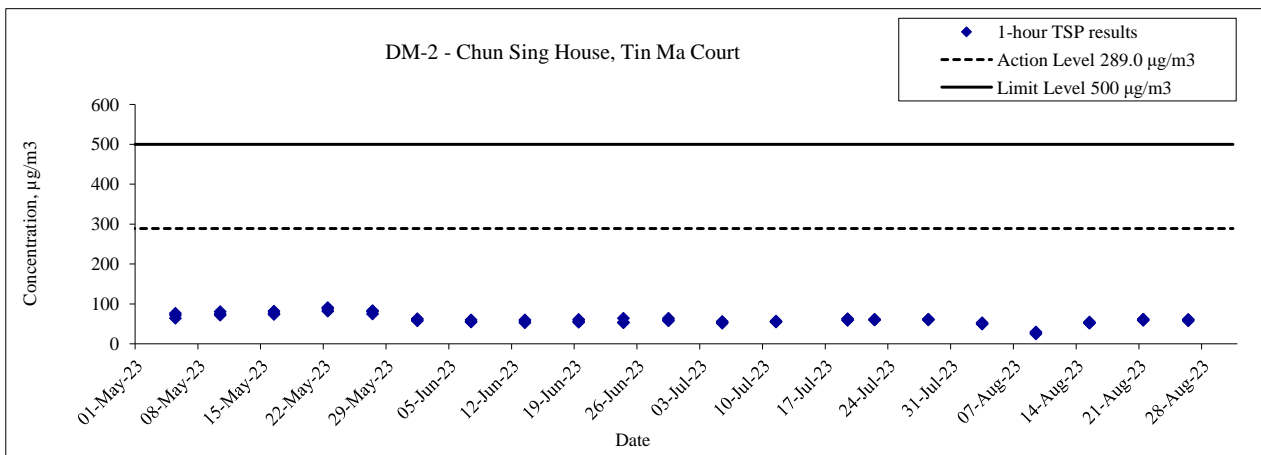
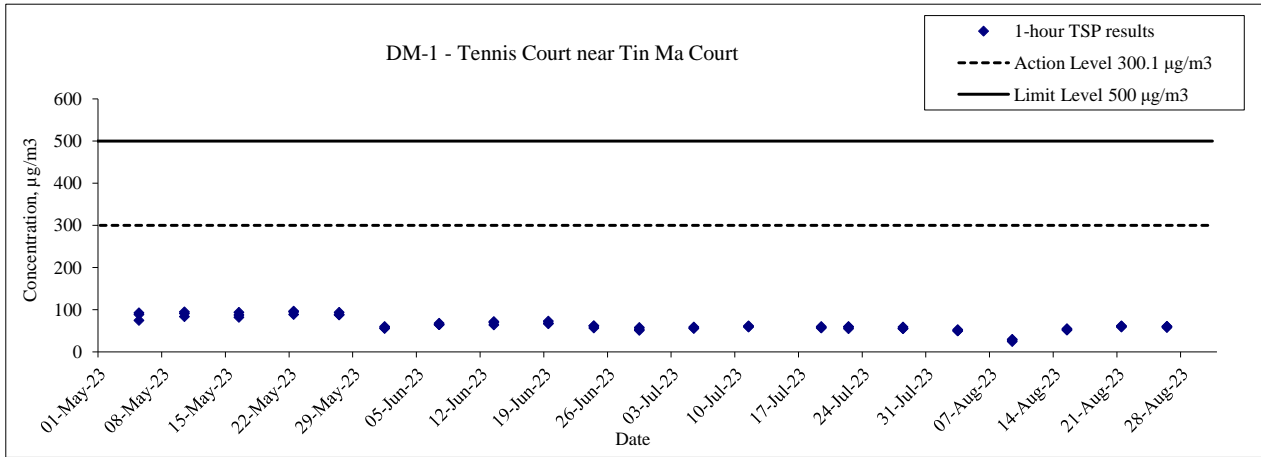
DM-3 - Grace Methodist Church Kindergarten			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
3 Aug 2023	9:07	Sunny	49
	10:07		52
	11:07		46
9 Aug 2023	14:02	Sunny	17
	15:02		21
	16:02		23
15 Aug 2023	8:36	Sunny	54
	9:36		55
	10:36		53
21 Aug 2023	13:40	Sunny	52
	14:40		54
	15:40		51
26 Aug 2023	9:32	Sunny	59
	10:32		60
	11:32		58
Minimum			17
Maximum			60
Average			47

DM-4 - Block 6, Tsui Chuk Garden			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
3 Aug 2023	8:30	Sunny	51
	9:30		53
	10:30		50
9 Aug 2023	8:21	Sunny	20
	9:21		23
	10:21		21
15 Aug 2023	10:12	Sunny	46
	11:12		48
	12:12		45
21 Aug 2023	8:12	Sunny	49
	9:12		50
	10:12		48
26 Aug 2023	11:50	Sunny	56
	12:50		61
	13:50		59
Minimum			20
Maximum			61
Average			45

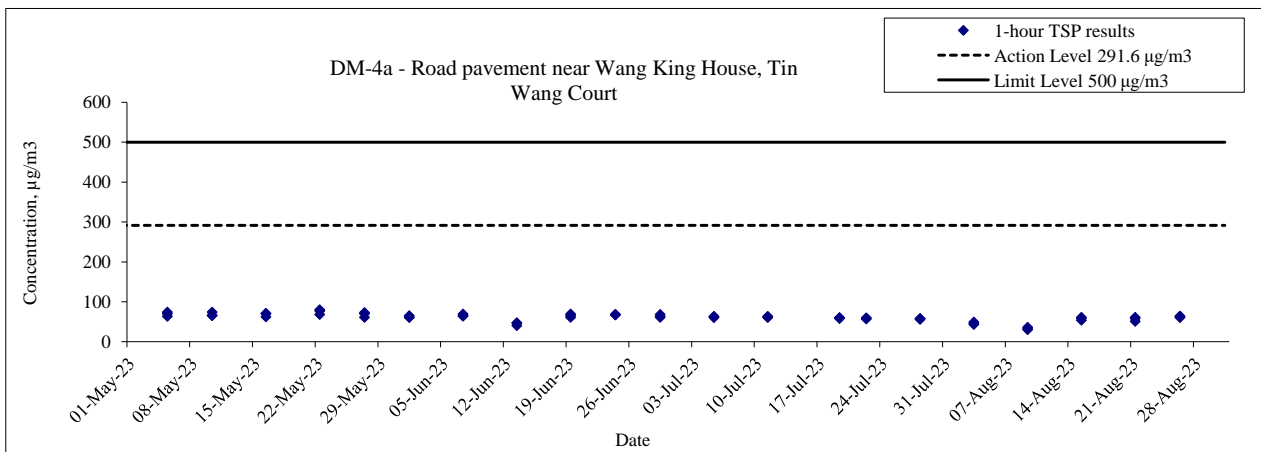
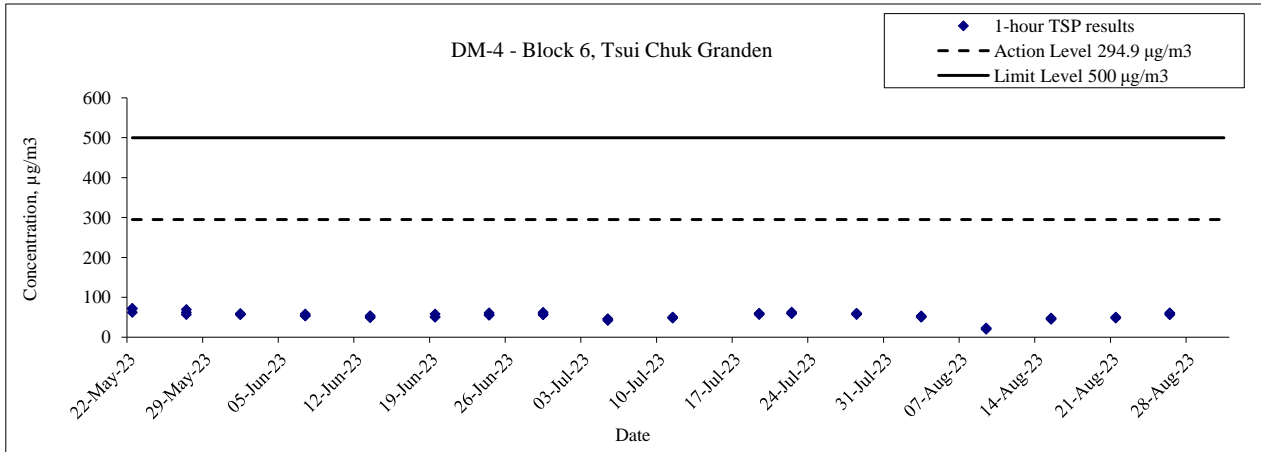
Appendix G - 1-hour TSP Monitoring Results

DM-4a - Road pavement near Wang King House, Tin Wang Court			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
3 Aug 2023	14:30	Sunny	46
	15:30		49
	16:30		43
9 Aug 2023	9:21	Sunny	32
	10:21		30
	11:21		36
15 Aug 2023	13:10	Sunny	59
	14:10		61
	15:10		54
21 Aug 2023	9:26	Sunny	51
	10:26		61
	11:26		58
26 Aug 2023	14:00	Sunny	63
	15:00		64
	16:00		60
		Minimum	30
		Maximum	64
		Average	51

1-hour TSP Concentration Level



1-hour TSP Concentration Level

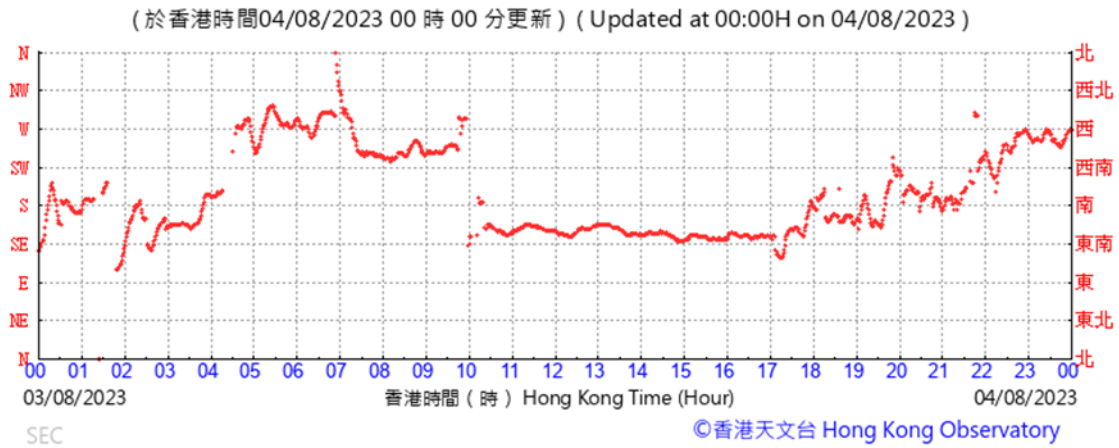


Appendix H

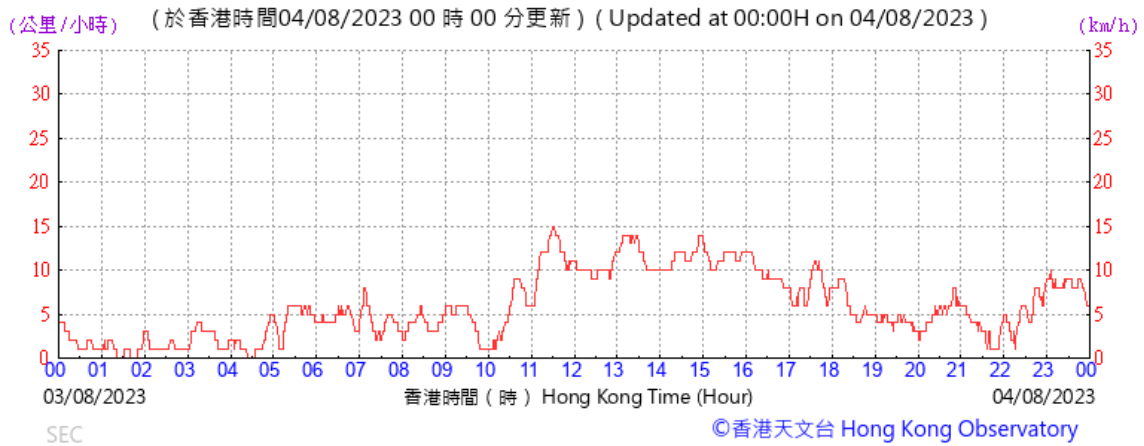
Extract of Meteorological Observations for Hong Kong (Kai Tak)

Appendix H - Extract of Meteorological Observations for Hong Kong (Kai Tak Wind Station)

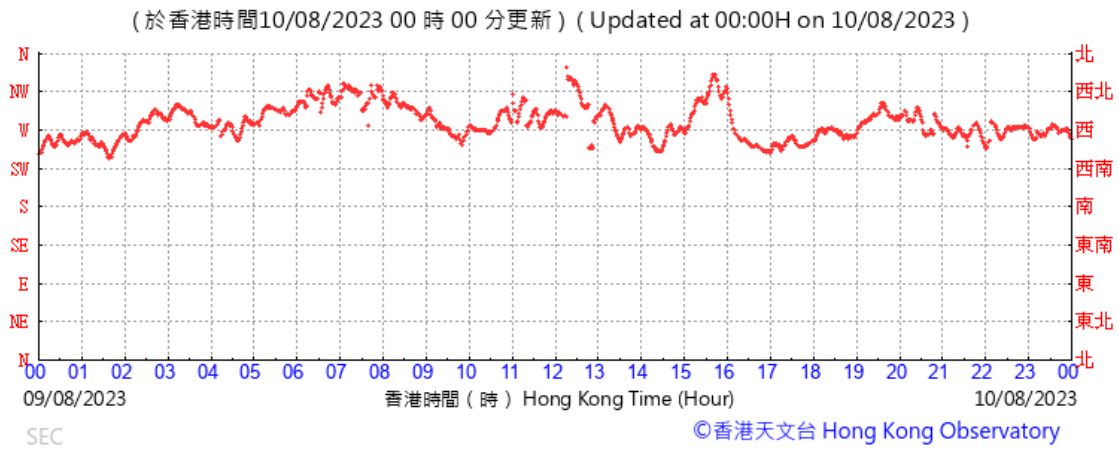
Wind Direction



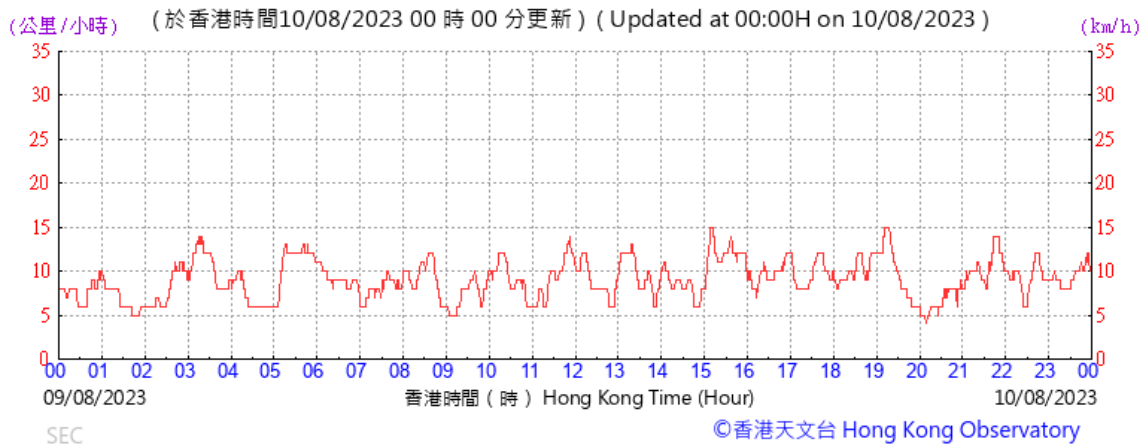
Wind Speed



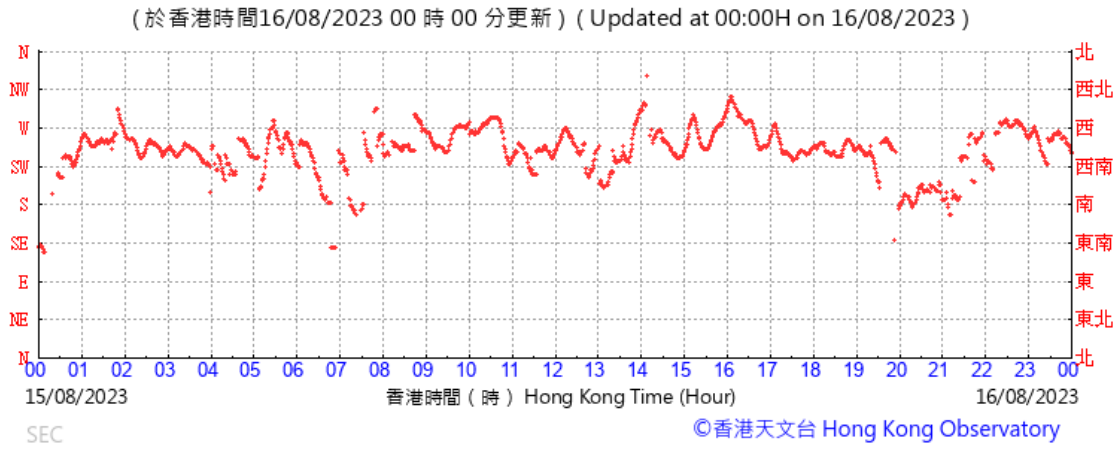
Wind Direction



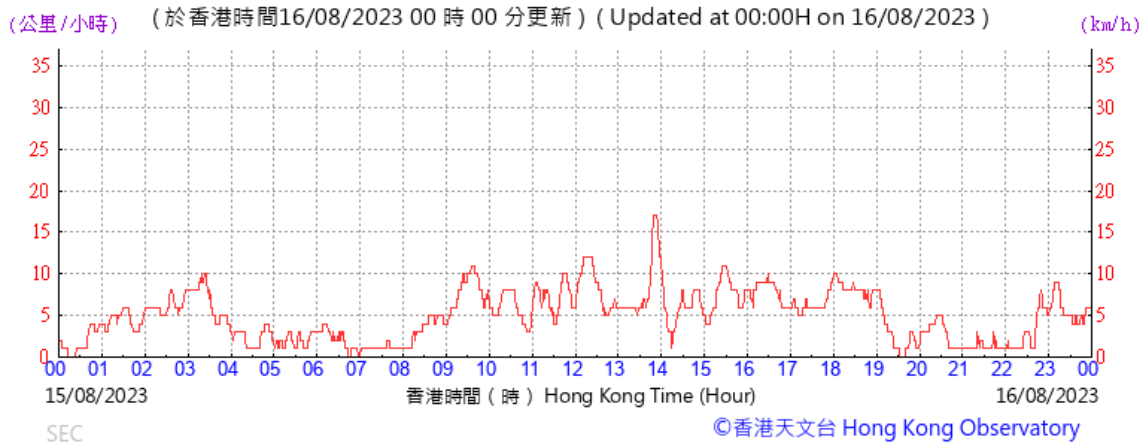
Wind Speed



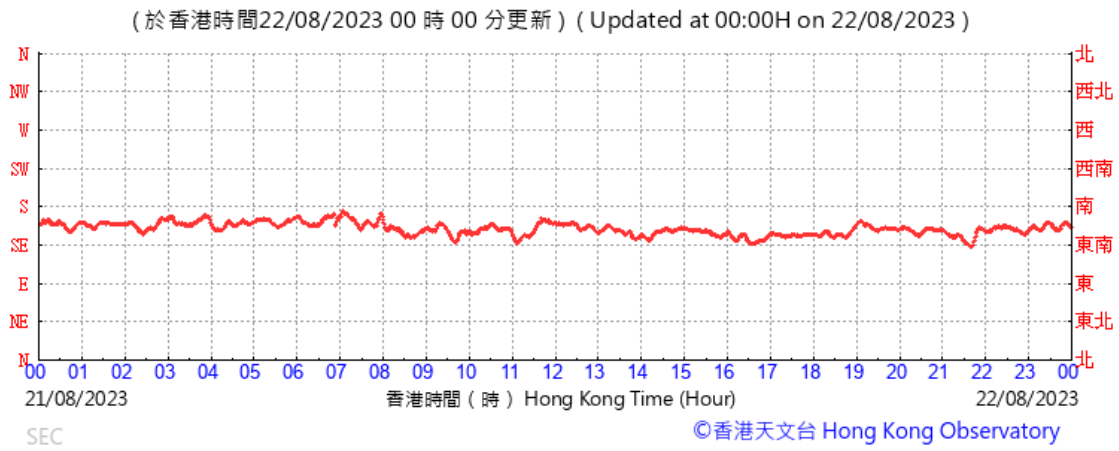
Wind Direction



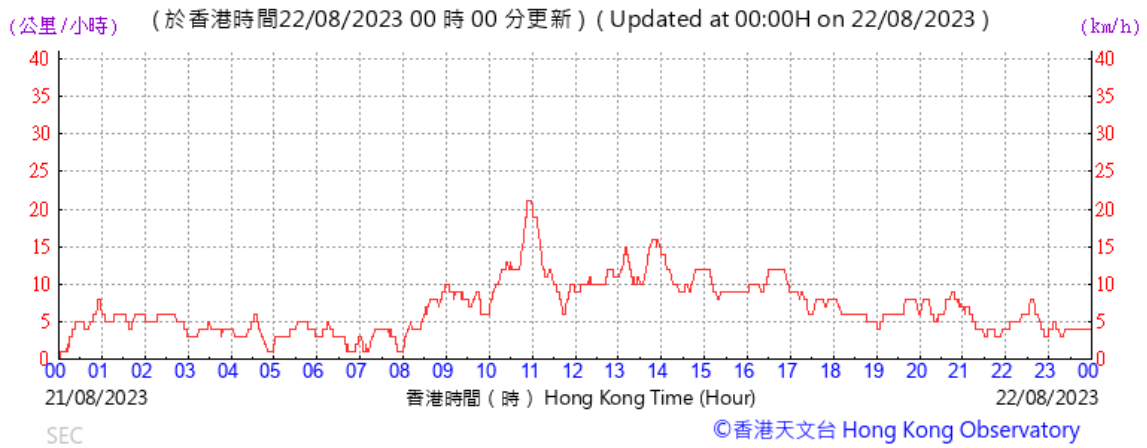
Wind Speed



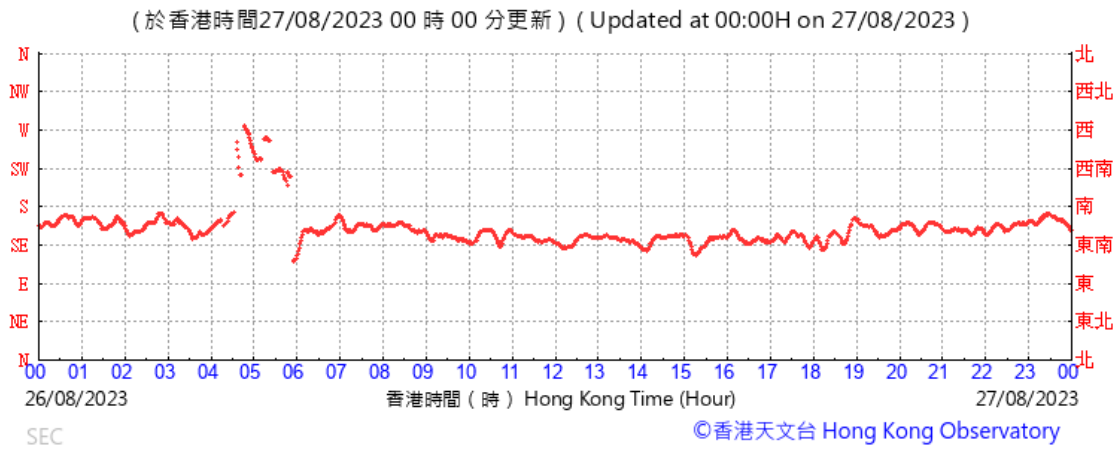
Wind Direction



Wind Speed



Wind Direction



Wind Speed



Appendix I

Noise Monitoring Results and Graphical Presentation

Appendix I - Construction Noise Monitoring Results

Construction Noise Monitoring Stations: Chun Sing House, Tin Ma Court (NM-2)

Date	Weather	Start Time	dB(A)			
			Leq	L10	L90	Leq(30min)
3 Aug 2023	Sunny	14:30	67.1	71.2	66.1	68.1
		14:35	68.2	72.2	66.3	
		14:40	68.9	73.1	66.4	
		14:45	68.1	72.4	67.1	
		14:50	67.9	71.1	67.6	
9 Aug 2023	Sunny	14:55	68.3	72.6	66.3	68.5
		10:50	68.2	71.3	65.2	
		10:55	67.9	69.4	64.4	
		11:00	68.8	71.2	65.4	
		11:05	69.4	73.2	64.1	
15 Aug 2023	Sunny	11:10	67.9	69.9	65.3	68.9
		11:15	68.6	71.2	65.1	
		13:21	67.1	68.1	65.2	
		13:26	68.9	69.4	66.9	
		13:31	69.4	71.2	67.2	
21 Aug 2023	Sunny	13:36	70.6	72.6	68.4	69.3
		13:41	68.8	69.9	67.4	
		13:46	67.9	69.6	66.9	
		14:00	69.2	71.2	60.2	
		14:05	70.1	72.3	61.2	
26 Aug 2023	Sunny	14:10	68.3	70.6	61.9	62.3
		14:15	69.2	71.6	60.9	
		14:20	70.2	72.4	62.1	
		14:25	68.3	70.9	61.6	
		8:30	61.5	63.1	57.8	
8:35	62.3	65.4	59.1	62.3		
8:40	62.6	64.2	57.0			
8:45	63.1	66.4	56.2			
8:50	62.9	64.3	58.2			
8:55	61.1	63.9	59.2			
					Min:	62.3
					Max:	69.3
					Average:	67.4

Construction Noise Monitoring Stations: Grace Methodist Church Kindergarten (NM-3)

Date	Weather	Start Time	dB(A)			
			Leq	L10	L90	Leq(30min)
3 Aug 2023	Sunny	9:40	66.3	68.1	65.4	67.4
		9:45	67.9	69.6	66.3	
		9:50	68.1	69.1	67.1	
		9:55	67.7	68.6	65.4	
		10:00	67.9	68.6	66.9	
9 Aug 2023	Sunny	10:05	66.2	68.4	64.2	67.1
		9:47	66.3	68.2	62.1	
		9:52	66.9	67.9	63.1	
		9:57	67.1	69.2	62.9	
		10:02	66.8	68.3	62.4	
15 Aug 2023	Sunny	10:07	68.1	71.2	63.1	68.8
		10:12	67.4	68.2	62.4	
		10:21	68.2	70.3	64.3	
		10:26	67.8	69.1	65.1	
		10:31	69.2	71.6	64.6	
21 Aug 2023	Sunny	10:36	68.4	70.9	65.2	67.2
		10:41	69.1	71.6	64.9	
		10:46	69.6	71.1	65.2	
		9:30	66.3	67.6	62.4	
		9:35	67.1	68.4	63.1	
26 Aug 2023	Sunny	9:40	66.9	67.7	65.6	69.2
		9:45	68.4	69.4	62.6	
		9:50	67.2	68.9	62.9	
		9:55	67.3	68.2	63.1	
		9:33	69.7	72.2	58.0	
9:38	70.2	73.2	60.2	69.2		
9:43	68.2	71.6	59.0			
9:48	67.7	69.3	56.2			
9:53	70.3	73.9	61.2			
9:58	68.7	72.6	60.3			
					Min:	67.1
					Max:	69.2
					Average:	68.0

Appendix I - Construction Noise Monitoring Results

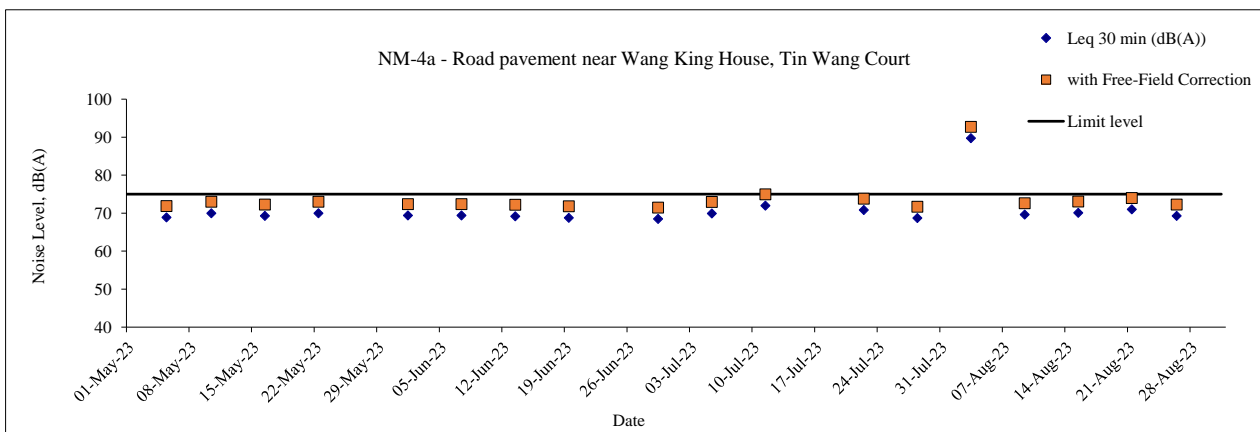
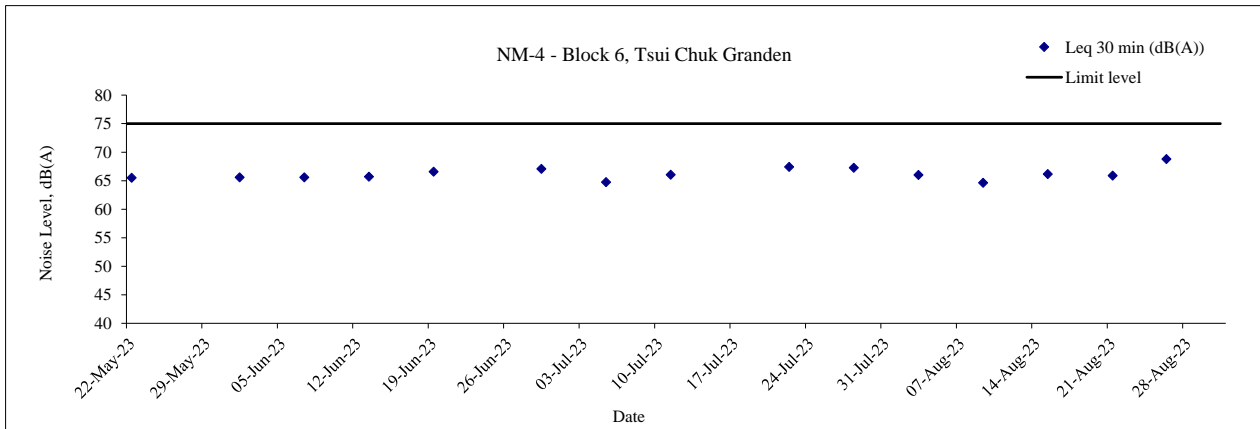
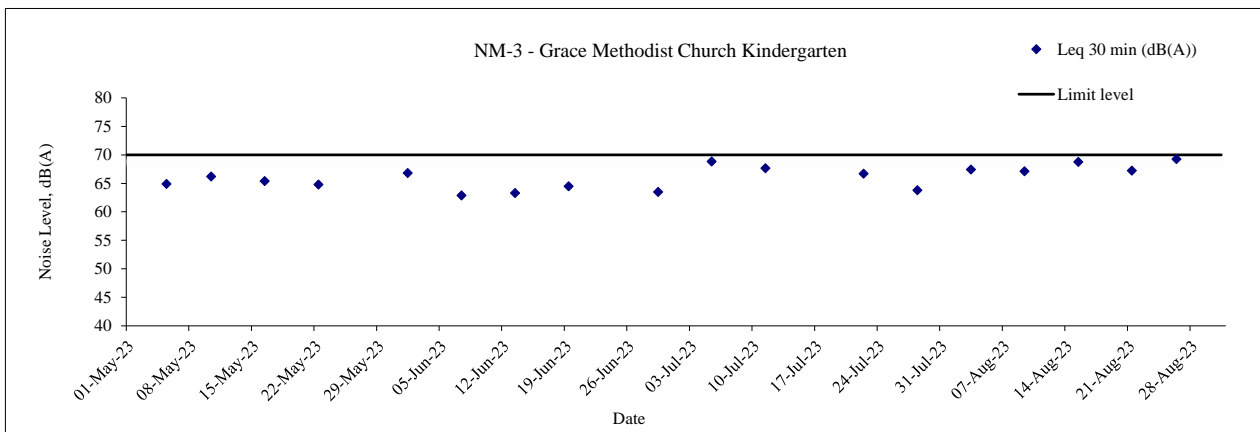
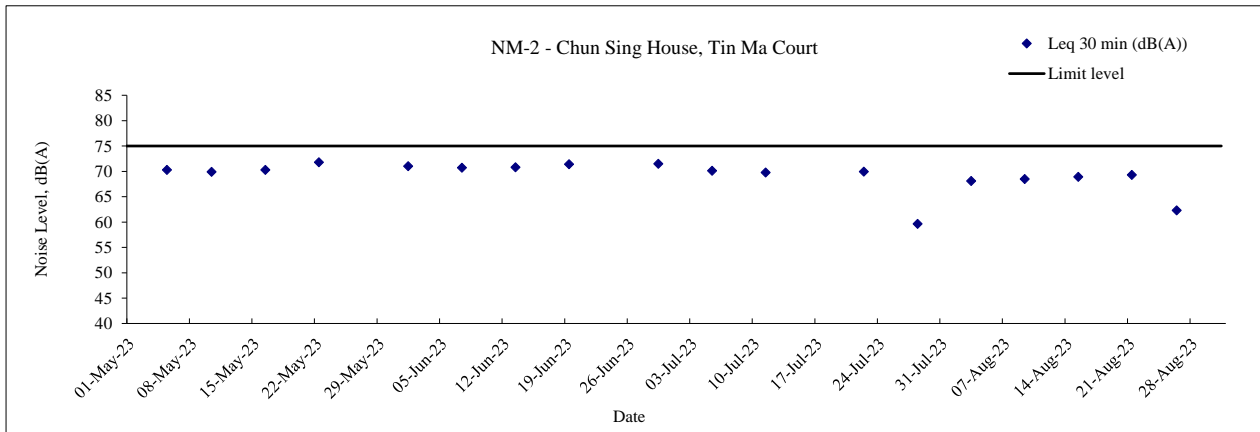
Construction Noise Monitoring Stations: Block 6, Tsui Chuk Garden (NM-4)

Date	Weather	Start Time	dB(A)			
			Leq	L10	L90	Leq(30min)
3 Aug 2023	Sunny	8:30	64.4	68.4	60.4	66.0
		8:35	63.4	67.7	59.6	
		8:40	69.1	71.2	67.3	
		8:45	64.9	67.1	62.6	
		8:50	65.6	68.6	64.1	
9 Aug 2023	Sunny	8:30	61.4	63.2	58.6	64.7
		8:35	62.9	63.6	59.1	
		8:40	67.1	69.4	60.4	
		8:45	64.3	68.1	60.6	
		8:50	65.6	67.8	63.6	
15 Aug 2023	Sunny	8:31	66.3	68.4	62.1	66.3
		8:36	67.1	69.4	63.1	
		8:41	61.9	64.2	60.2	
		8:46	68.4	71.2	65.1	
		8:51	65.1	67.6	63.2	
21 Aug 2023	Sunny	10:11	64.7	68.1	60.1	65.9
		10:16	65.1	67.2	61.4	
		10:21	66.2	69.6	61.2	
		10:26	64.9	67.2	62.1	
		10:31	66.9	69.1	61.9	
26 Aug 2023	Sunny	11:53	68.1	69.2	57.8	68.8
		11:58	69.2	70.3	58.6	
		12:03	67.2	68.2	56.2	
		12:08	68.3	69.9	57.9	
		12:13	69.1	70.9	59.4	
		12:18	70.2	72.6	60.3	
			Min:		64.7	
			Max:		68.8	
			Average:		66.3	

Construction Noise Monitoring Stations: Road pavement near Wang King House, Tin Wang Court (NM-4a)

Date	Weather	Start Time	dB(A)				Leq(30min)	With Free-Field Correction
			Leq	L10	L90			
3 Aug 2023	Sunny	10:13	91.5	94.6	71.9	89.7	92.7	
		10:18	90.4	92.4	71.0			
		10:23	88.9	90.4	70.3			
		10:28	89.5	92.0	70.8			
		10:33	88.8	91.6	70.6			
9 Aug 2023	Sunny	10:38	88.6	90.6	70.3	69.6	72.6	
		9:05	70.1	72.1	67.1			
		9:10	69.7	71.6	66.3			
		9:15	68.9	69.2	67.1			
		9:20	70.6	73.2	68.2			
15 Aug 2023	Sunny	9:25	68.6	70.6	67.4	70.1	73.1	
		9:30	69.6	71.6	65.1			
		9:21	70.1	72.1	69.1			
		9:26	71.1	73.2	69.6			
		9:31	70.6	71.6	68.2			
21 Aug 2023	Sunny	9:36	69.9	72.9	64.1	71.0	74.0	
		9:41	68.9	72.6	64.4			
		9:46	69.7	70.2	68.2			
		12:57	70.2	72.2	68.1			
		13:02	71.2	74.2	67.1			
26 Aug 2023	Sunny	13:07	72.4	74.9	68.6	69.3	72.3	
		13:12	70.6	73.1	69.2			
		13:17	71.1	72.9	68.3			
		13:22	70.2	72.1	67.6			
		13:26	68.6	70.6	59.0			
		13:31	69.6	71.3	58.1			
		13:36	70.1	72.6	59.2			
		13:41	67.2	68.3	58.2			
		13:46	69.3	71.6	59.4			
		13:51	70.2	72.1	58.1			
			Min:		69.3	72.3		
			Max:		89.7	92.7		
			Average:		74.0	77.0		

Construction Noise Monitoring Results



Appendix J

Waste Generation in the Reporting Month

Monthly Summary Waste Flow Table for 2023

Contract No.: 21/WSD/21

Contract Title: Relocation of Diamond Hill Fresh Water and Salt Water Service Reservoirs to Caverns

Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000m ³)						Actual Quantities of C&D Wastes Generated					Actual Quantities of C&D Wastes Recycled				
	Total Quantity Generated	Broken Concrete (including rock for recycling into aggregates)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported C&D Material	Metals	Paper/ cardboard packaging	Plastics (bottles/containers, plastic sheets/foam package material)	Chemical Waste	Others, e.g. general refuse	Metals	Paper/ cardboard packaging	Plastics (bottles/containers, plastic sheets/foam package material)	Yard Waste	Others
	(a+b+c+d)	(a)	(b)	(c)	(d)		(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)	(in '000m ³)
Jan	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000	0.00000	0.00000	0.00000	0.00000	0.0000	0.00000	0.00000	0.00000	0.00000
Feb	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000	0.00000	0.00000	0.00000	0.00000	0.0000	0.00000	0.00000	0.00000	0.00000
Mar	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000	0.00000	0.00000	0.00000	0.00000	0.0000	0.00000	0.00000	0.00000	0.00000
Apr	0.05712	0.00000	0.00000	0.00000	0.05712	0.00000	0.0000	0.00000	0.00000	0.00000	0.20064	0.0000	0.00000	0.00000	0.00686	0.00000
May	0.95983	0.00000	0.00000	0.00000	0.95983	0.00000	0.0000	0.00000	0.00000	0.02408	0.0000	0.00000	0.00000	0.00000	0.00000	0.00000
Jun	0.14853	0.00000	0.00000	0.00000	0.14853	0.00000	0.0000	0.00000	0.00000	0.03804	0.0000	0.00000	0.00000	0.00000	0.00000	0.00000
Sub-total	1.16548	0.00000	0.00000	0.00000	1.16548	0.00000	0.0000	0.00000	0.00000	0.26277	0.0000	0.00000	0.00000	0.00686	0.00000	
Jul	0.06719	0.00000	0.00000	0.00000	0.06719	0.00000	0.0000	0.00000	0.00000	0.00618	0.0072	0.00335	0.00980	0.00000	0.00000	
Aug	0.18593	0.00000	0.00000	0.00000	0.18593	0.00000	0.0000	0.00000	0.00000	0.01659	0.0058	0.02575	0.00550	0.00000	0.00000	
Sep	0.00000															
Oct	0.00000															
Nov	0.00000															
Dec	0.00000															
Total	1.41860	0.00000	0.00000	0.00000	1.41860	0.00000	0.00000	0.00000	0.00000	0.28553	0.01300	0.02910	0.01530	0.00686	0.00000	

- Note:
1. Assume the density of soil fill is 2 ton/m³.
 2. Assume the density of rock and broken concrete is 2.5 ton/m³.
 3. Assume the density of non-inert C&D waste is 0.9 ton/m³.

Appendix K

Summary of Complaint, Notification of Summons and Prosecution and Cumulative Complaint Log

Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 August 2023 – 31 August 2023	0	0	N/A

Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Details
1 August 2023 – 31 August 2023	0	0	N/A

Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Details
1 August 2023 – 31 August 2023	0	0	N/A

Statistical Summary of Non-compliance (exceedances) of the Reporting Period

Environmental Monitoring	Parameter	No. of non-project related exceedances		Total no. of non-project related exceedances	No. of exceedances related to the project		Total no. of exceedances related to the project
		AL	LL		AL	LL	
Air Quality	1-hour TSP	0	0	0	0	0	0
Noise	$L_{eq(31-min)}$	0	1	1	0	0	0

Cumulative Complaint Log

EPD Complaint Ref No.	Date of Complaint	Complaint Location	Complaint Details	Investigation / Mitigation Action	Status
-	-	-	-	-	-

Appendix L

Incident Report(s) for Construction Noise Monitoring Exceedance

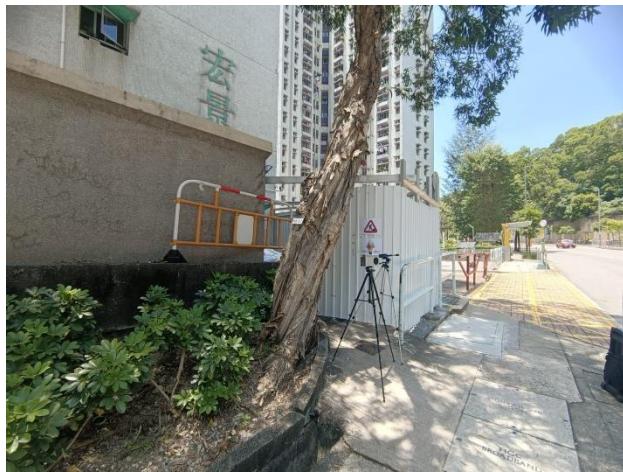
Investigation Report for Exceedance of Limit Level of Construction Noise Monitoring on 3 August 2023

Investigation was carried out in response to an exceedance of limit level during the construction noise monitoring on 3 August 2023. The following table summarizes details of the exceedance.

Date	Time	Monitoring Station	Location	Measured Result <i>L_{eq}</i> (30 min) dB(A)	Re-Measured Results <i>L_{eq}</i> (30 min) dB(A)	Limit Level dB(A)
03/08/2023	10:13	NM-4a	Road pavement near Wang King House, Tin Wang Court	92.7	88.8	75

Construction activities carried out during the investigation period:	<p>According to the information provided by the Contractor, the construction works carried out within the site area (Portion 3 at Lion Rock Park) on 3 August 2023 include:</p> <ul style="list-style-type: none"> • Backfilling; • Setup of water-barrier and housekeeping.
Possible reason for Action or Limit Level Non-compliance:	<p>According to on-site observation during the construction noise monitoring at NM-4a on 3 August 2023, non-project related construction activities was observed next to the noise monitoring station NM-4a. Handheld breaker was observed operating during the noise monitoring and considered as a major noise source during the monitoring.</p> <p>According to the information provided by the Contractor, no project related construction work was carried out near the noise monitoring station NM-4a. (Figure 1)</p> <p>In conclusion, the limit level exceedance recorded at noise monitoring station NM-4a on 3 August 2023 was considered non-project related.</p>
Action taken / to be taken:	<ol style="list-style-type: none"> 1. Noise sources during the noise monitoring was identified and recorded on the field record sheet. 2. Notifications of exceedance have been issued to the IEC, the Contractor, and the Engineer's Representative. 3. Repeated measurement was carried out to confirm the limit level exceedance at NM-4a. 4. The noise monitoring frequency was not increased since the limit level exceedance recorded on 3 August 2023 was considered non-project related. 5. The Contractor's working procedures were checked and reviewed during the weekly site inspection on 3 August 2023, no non-compliance was observed. As no evidence was found to indicate that the exceedance on 3 August 2023 was affected by the site activities, no additional mitigation measure was proposed. 6. The ET would review the site condition at NM-4a in coming weeks and propose suspension of noise monitoring or relocation of noise monitoring station, wherever appropriate.

Site Observation Photos around noise Monitoring Stations taken by the ET on 3 August 2023



Noise Monitoring Station: NM-4a



Non-project related construction works

Photo Records on 3 August 2023 provided by the Contractor

Portion 3 (Lion Rock Park)



Construction activities: Backfill

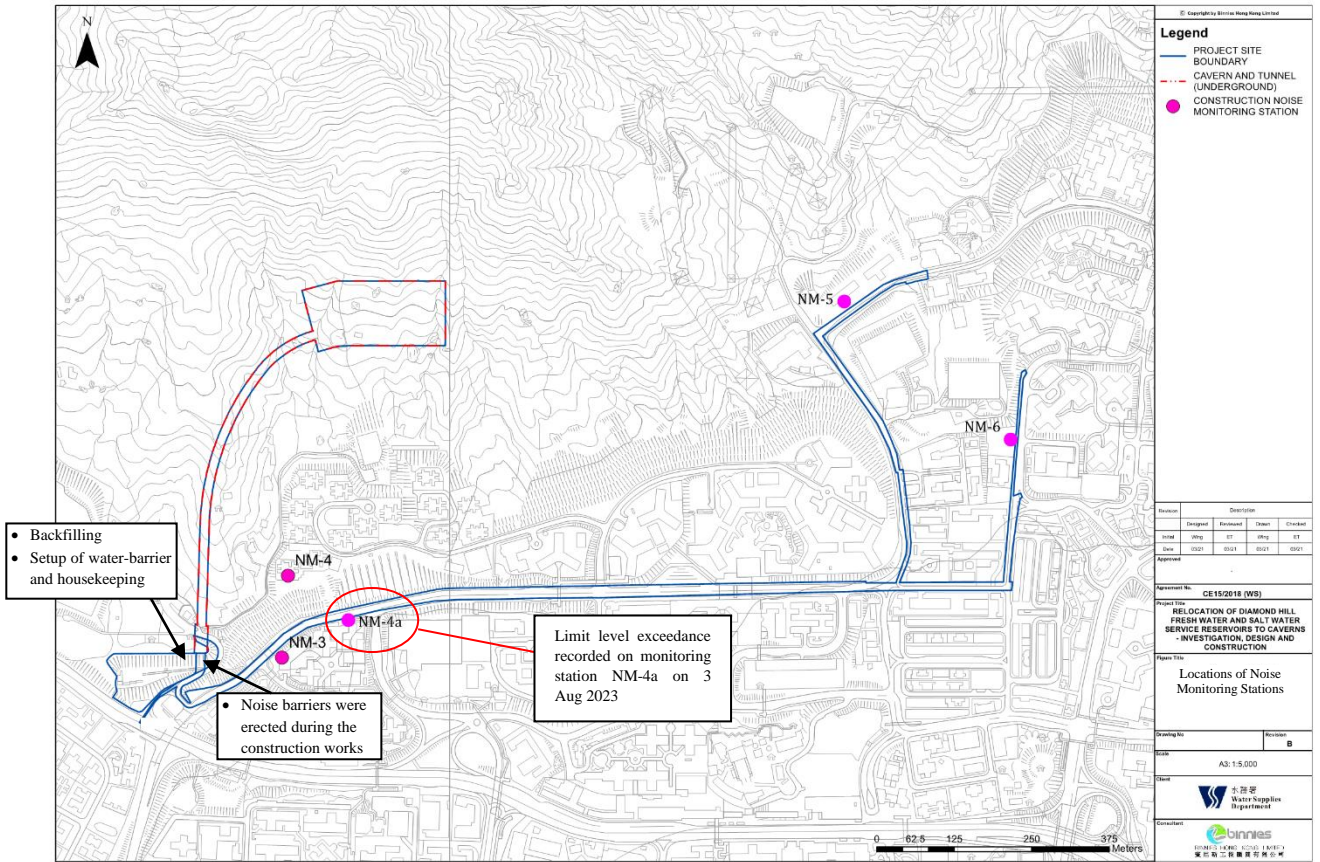



Construction activities: Setup water-barrier and housekeeping



Mitigation Measures: Noise barriers were erected during the construction works

Figure 1 Location Plan (Site activities held on 3 August 2023 were reported in text boxes)



Prepared by:	Howard Chan	Certified by:	F. C. Tsang
Designation:	Environmental Team Member	Designation:	Environmental Team Leader
Signature:		Signature:	
Date:	9 August 2023	Date:	9 August 2023