

JOB No.: TCS00881/18 & TCS00944/18

**SITE FORMATION AND ASSOCIATED INFRASTRUCTURAL
WORKS FOR DEVELOPMENT OF COLUMBARIUM,
CREMATORIUM AND RELATED FACILITIES AT SANDY
RIDGE CEMETERY**

**MONTHLY ENVIRONMENTAL MONITORING AND AUDIT
REPORT (NO.47) – JUNE 2022**

**PREPARED FOR
HSIN CHONG TSUN YIP JOINT VENTURE &
SANG HING CIVIL CONTRACTORS CO., LTD**

Date	Reference No.	Prepared By	Certified By
15 July 2022	TCS00881/18/600/R0660v2		
		Nicola Hon (Environmental Consultant)	Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	12 July 2022	First Submission
2	15 July 2022	Amended according to the IEC's comments

Our Ref: TCS00881/18/300/L0664

Civil Engineering and Development Department
2/F, Civil Engineering and Development Building,
101 Princess Margaret Rd,
Homantin, Kowloon

Attn: Mr. SHUM Ngai Hung, Steven

15 July 2022
By e-mail

Dear Sirs,

**Re: Site Formation and Associated Infrastructural Works for Development of Columbarium, Crematorium and Related Facilities at Sandy Ridge Cemetery
Monthly Environmental Monitoring & Audit Report (No.47) –June 2022**

We confirmed that the captioned report has complied with the requirement set out in the EM&A Manual, we hereby certify the captioned report pursuant to Specific Condition 3.4 of the Environmental Permit No. FEP-01/534/2017/A and EP-534/2017/A.

Should you have any queries, please feel free to contact the undersigned at Tel: 2959-6059 or Fax: 2959-6079 or Email: twtam@fordbusiness.com.

Yours sincerely,
For and on Behalf of
Action-United Environmental Services & Consulting (AUES)



T. W. Tam
Environmental Team Leader
TW/nh

cc	ARUP (RE of Contract 1)	Mr. Steven Tang	by e-mail
	ARUP (RE of Contract 2)	Mr. Anthony Lau	by e-mail
	HCTY-JV (Contractor of Contract 1)	Mr. Ho Man To	by e-mail
	Sang Hing (Contractor of Contract 2)	Mr. Elvin Lam	by e-mail
	Acuity (IEC)	Mr. Jacky Leung	by e-mail

Our ref: PL-202207017

Hsin Chong Tsun Yip Joint Venture (CV/2016/10)
Hsin Chong Centre
107-109 Wai Yip Street
Kwun Tong, Kowloon
Hong Kong

Attention: Mr. HO Man-to

15 July 2022

Dear Sir,

**Site formation and Associated Infrastructural Works for Development of Columbarium at Sandy Ridge Cemetery
Monthly Environmental Monitoring and Audit Report (No. 47) June 2022**

I refer to the email of the ET regarding the captioned Monthly Report. According to Section 3.4 of the EP-534/2017/A and the FEP-01/534/2017/A, I hereby verify the Monthly EM&A report for June 2022 (Version 2) with Ref. No. TCS00881/18/600/R0660v2.

You are required to follow up the comments from EPD and IEC on the relevant EPs requirement and provide supplementary information of this report for our further review as soon as possible.

Yours faithfully,

CH Leung

Leung CH Jacky
Independent Environmental Checker

cc. CEDD-DPTL/Land Works – Mr. SHUM Steven
ARUP – Mr. LEE Davis
ET Leader – Mr. TAM

EXECUTIVE SUMMARY

ES.01. This is the 47th Monthly Environmental Monitoring and Audit (EM&A) Report summarizing the monitoring results and inspection findings under the Project for the period from 1st to 30th June 2022 (the Reporting Month).

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.02. In the Reporting Month, the major construction works under the Project included Contract CV/2016/10 (hereinafter named “Contract 1”) and Contract CV/2017/02 (hereinafter named “Contract 2”). Environmental monitoring activities under the EM&A programme in this Reporting Month are summarized in the following table.

Table ES-1 Summary of EM&A Programme in the Reporting Month

Issues	Environmental Monitoring Parameters / Inspection	Monitoring Locations		Total Occasions/ dates
		CV/2016/10	CV/2017/02	
Air Quality	1-hour TSP	ASR-1	ASR-2	54
	24-hour TSP		ASR-3	18
Construction Noise	L _{eq} (30min) Daytime	CN-1 CN-2	CN-3 CN-4	20
Water Quality	In-situ measurement and Water sampling	M3	M1, M2 and M4	13 (#)
Ecology	Sensitive Habitat	Transect within site area of CV/2016/10	Transect within site area of CV/2017/02	14 th June 2022
Landscape & Visual	Site Inspection	Site area of CV/2016/10	Site area of CV/2017/02	28 th June 2022
Inspection & Audit	Environmental Team (ET) Regular Environmental Site Inspection	Site area of CV/2016/10	Site area of CV/2017/02	5
	Independent Environmental Checker (IEC) Monthly Environmental Site Audit			1

Remarks: (#) The channel of M2 was dried up / too shallow on 24 June 2022 and representative water sampling were unable be carried out. Notification was provided to relevant parties in the following day of the event.

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES.03. In the Reporting Month, no exceedance of air quality and noise monitoring was recorded. For water quality monitoring, 12 Limit level non-project related exceedances were recorded. The statistics of environmental exceedance, Notification of Exceedance (NOE) issued and investigation of exceedance are summarized in the following table.

Table ES-2 Breach of Action and Limit (A/L) Levels in the Reporting Month

Environmental Issues	Monitoring Parameters	Action Level	Limit Level	Event & Action	
				Investigation Findings	Corrective Actions
Air Quality	1-hour TSP	0	0	-	-
	24-hour TSP	0	0	-	-
Construction Noise	Leq _{30min} Daytime	0	0	-	-
Water Quality	DO	0	0	-	-
	Turbidity	0	6	Not project related.	
	Suspended Solids (SS)	0	6		

ES.04. In the Reporting Month, 12 Limit level water quality exceedances, namely 6 exceedances of turbidity and 6 exceedances of SS were recorded. According to the weather information from the HKO, there was heavy rainstorm intermittently during the days of exceedance recorded. Under the impact of rainstorm, the water quality of the watercourse was deteriorated by the stirred up sediment and runoff from the surrounding environment. Weekly site inspection revealed that water quality mitigation measures were in place and the site conditions were generally in order. It was concluded

that the exceedances were likely related to the impact of rainstorm and not caused by the work under the project.

- ES.05. Monthly ecological monitoring for sensitive habitat for area of Contract 1 and Contract 2 were undertaken on **14th June 2022**. After analysing survey results in June from 2019 to 2022, there was no significant drop in species richness and abundance for wetland habitat under Contract 1 and Contract 2. Yet, good site practice during construction, with reference to EM&A Manual, is required to prevent or alleviate environmental impacts. For instance, the size of work areas should be minimized and disturbed areas should be reinstated immediately after completion of construction works. Unnecessary site clearance should be avoided as well. In addition, implementing proper waste disposal is necessary to reduce contamination to water and soil. Continuous monitoring is also recommended to inspect any significant decrease in species diversity.
- ES.06. As advised by both Contractors, there were no vegetation clearance conducted within the site in the Reporting Month and therefore precautionary check for the presence of nesting birds was not required.
- ES.07. Landscape and visual inspection at both Contracts were undertaken on **28th June 2022**. The Contractor was reminded to prevent the construction material pile within Tree Protection Zone and ensure no works is allowed within the TPZ.

ENVIRONMENTAL COMPLAINT

- ES.08. No environmental summons or successful prosecution was recorded in this Reporting Month. The statistics of summons or successful prosecutions are summarized in the following tables.

Table ES-3 Environmental Complaint Summaries in the Reporting Month

Reporting Month		Environmental Complaint Statistics		
		Frequency	Cumulative	Complaint Nature
1 st – 30 th June 2022	Contract 1	0	2	(1) Air Quality (1) Noise
	Contract 2	0	3	(1) Water (1) Air Quality (1) Noise

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

- ES.09. No environmental summons or successful prosecution was recorded in this Reporting Month. The statistics of summons or successful prosecutions are summarized in the following tables.

Table ES-4 Environmental Summons Summaries in the Reporting Month

Reporting Month		Environmental Summons Statistics		
		Frequency	Cumulative	Summons Nature
1 st – 30 th June 2022	Contract 1	0	0	NA
	Contract 2	0	0	NA

Table ES-5 Environmental Prosecution Summaries in the Reporting Month

Reporting Month		Environmental Prosecution Statistics		
		Frequency	Cumulative	Prosecution Nature
1 st – 30 th June 2022	Contract 1	0	0	NA
	Contract 2	0	0	NA

- ES.010. In addition, no complaint and emergency event relating to violation of environmental legislation for illegal dumping and landfilling was received.

REPORTING CHANGE

- ES.011. No reporting change was made in the Reporting Month.

SITE INSPECTION

ES.012. In the Reporting Month, joint site inspections for Contract 1 to evaluate the site environmental performance were carried out by the Resident Engineer, ET and the Contractor of the Contract 1 on *1st, 9th, 16th, 21st and 30th June 2022*. Moreover, joint site inspections for Contract 2 by the RE, ET and the Contractor of Contract 2 were carried out on *1st, 9th, 16th, 21st and 30th June 2022*. IEC attended joint site inspection for both Contracts *21st June 2022*. No non-compliance was noted during the site inspections.

FUTURE KEY ISSUES

ES.013. During wet season, the Contractors are reminded to pay special attention on water quality mitigation measures and should fully implement the measures as recommended in the EM&A Manual, in particular to prevent surface runoff and other pollutants from flowing to local stream and Conservation Area.

ES.014. Air quality mitigation measures such as wheel wash facilities, watering of haul roads, loose soil construction surface and covering of dusty materials with tarpaulin sheet should be implemented as far as practicable.

ES.015. Construction noise would be a key environmental issue during construction phase of the Project. Noise mitigation measures such as using quiet plants and mobile noise barriers should be implemented in accordance with the EM&A requirement.

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1. INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 Civil Engineering and Development Department (CEDD) is the Project Proponent for the Project “*Site Formation and Associated Infrastructural Works for Development of Columbarium, Crematorium and Related Facilities at Sandy Ridge Cemetery*”. The Project is a Designated Project to be implemented under Environmental Permit No. EP-534/2017/A and FEP-01/534/2017/A. The layout plan of the Project is shown in [Appendix A](#). Major works to be executed under the Project shall include to the following:

A Designated Works under EP-534/2017/A

- (i) Site formation of about 8 hectares of land and associated drainage, sewerage and landscape works for development of Columbarium and Crematorium facilities at the Sandy Ridge Cemetery;
- (ii) Construction of a new road (about 600m) including a section of viaduct connecting the platform for Crematorium and Man Kam To Road and the pick-up/drop-off point at Man Kam To Road;
- (iii) Widening of about 900m of the existing Sha Ling Road;
- (iv) Widening of about 1.4km of the existing Lin Ma Hang Road; and
- (v) Improvement works to the existing barging point at Siu Lam

Non-Designated Works

- (i) Construction of a sewage detention tank complete with odour and septicity control mechanism;
- (ii) Construction of noise barriers along Sha Ling Road;
- (iii) Construction of a new Refuse Collection Point (RCP) near the junction between Man Kam To Road and Sha Ling Road;
- (iv) Landscaping works (including both hard and soft landscape works);
- (v) Associated tree felling, transplanting and compensatory planting works;
- (vi) Associated street lighting, street furniture and road marking, etc.; and
- (vii) Other works which are specified in PS of the Contract.

1.1.2 To facilitate the Project management, the Project works were separated into three Contracts to be executed which are described in below sub-sections.

1.1.3 *Contract No. CV/2016/10 – Site Formation and Associated Infrastructural Works for Development of Columbarium at Sandy Ridge Cemetery* (hereinafter named “Contract 1”):-

- Site formation of about 1.77 ha of land for the proposed pick-up and drop-off area for shuttle bus operation;
- Upgrading of a section of 900m existing Sha Ling Road from 3m wide carriageway to 7.3m wide carriageway with footpath at both sides;
- Construction of one EVA with a total length of about 160m;
- Construction of noise barriers along Sha Ling Road;
- Modification of junction between Man Kam To Road and Sha Ling Road;
- Construction of a new pick up / drop off point at Man Kam To Road;
- Relocation and construction of a new refuse collection point near junction between Man Kam To Road and Sha Ling Road;
- Associated geotechnical works including cut and fill slopes, soil nailing works and retaining structures;
- Associated drainage, sewerage and waterworks along Sha Ling Road; and
- Associated landscaping works.

1.1.4 *Contract No. CV/2017/02 – Infrastructural Works at Man Kam To Road and Lin Ma Hang Road for Development of Columbarium at Sandy Ridge Cemetery* (hereinafter named “Contract 2”):-

- Construction of a new road connecting Columbarium site to Crematorium site;
- Construction of one EVA with a total length of about 300m;
- Widening of a section of 1.4 km long Lin Ma Hang Road (between Man Kam To Road and Ping Yuen River) from 6m wide carriageway to 7.3m with 2m width footpath on both sides;
- Provision of a pair of lay-by at Lin Ma Hang Road;
- Construction of a new vehicular access connecting the Sheung Shui Landmark North PTI and Lung Sum Avenue;

- Construction of covered walkway along Fanling Station Road;
- Removal of planters and central divider along Fanling Station Road and San Wan Road;
- Associated drainage, sewerage, waterworks and utility works along Man Kam To Road and Lin Ma Hang Road;
- Associated geotechnical works including cut and fill slopes, soil nailing works and retaining structures; and
- Associated landscaping works.

1.1.5 *CEDD Contract No. (to be confirmed):-*

- Site Formation for the platform of the columbarium site;
- Construction of two 2 at-grade access roads;
- Construction of road junction between Man Kam To Road and the new access road;
- Associated drainage, sewerage and waterworks along the two new access roads;
- Associated geotechnical works including cut and fill slopes, soil nailing works and retaining structures; and
- Associated landscaping works

1.1.6 Hsin Chong Tsun Yip Joint Venture (hereafter referred as “HCTYJV”) has been awarded Contract 1 on 5 December 2017. According to the Contract requirement, HCTYJV shall take over the responsibility for part of the Environmental Permit No. EP-534/2017 for ease of management, therefore application for Further Environmental Permit was submitted by HCTYJV to EPD on 26 January 2018 and Further Environmental Permit No. FEP-01/534/2017 was granted to HCTYJV by EPD on 23 February 2018. Furthermore, EPD issued Environmental Permit No. FEP-01/534/2017/A on 24 December 2018.

1.1.7 Sang Hing Civil Contractors Company Limited (hereinafter referred as “Sang Hing”) was awarded Contract 2 on 23 May 2018. The Contract Works is a Designated Project as under Environmental Permit (EP) No. EP-534/2017. Furthermore, EPD issued Environmental Permit No. EP-534/2017/A on 24 December 2018.

1.1.8 Action-United Environmental Services & Consulting (AUES) has been commissioned by the Contractors as an Environmental Team (ET) to implement the Environmental Monitoring and Audit (EM&A) programme in accordance with the approved EM&A Manual as well as the associated duties. As part of the EM&A programme, baseline monitoring to determine the ambient environmental conditions was completed before construction work commencement. The Baseline Monitoring Report (air, noise and water) certified by ET Leader (ETL) and verified by Independent Environmental Checker (IEC) was submitted to Environmental Protection Department (EPD) and it was approved by EPD on 25 October 2018.

1.1.9 Major construction work of Contract 1 and Contract 2 was commenced on 16 August 2018 and 5 November 2018 respectively.

1.1.10 This is the 47th Monthly EM&A Report summarizing the monitoring results and inspection findings for the period from 1st to 30th June 2022.

1.2 REPORT STRUCTURE

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

- Section 1** *Introduction*
- Section 2** *Project Organization and Construction Progress*
- Section 3** *Summary of Monitoring Requirements*
- Section 4** *Air Quality Monitoring Results*
- Section 5** *Noise Monitoring Results*
- Section 6** *Water Quality Monitoring Results*
- Section 7** *Ecology Monitoring Results*
- Section 8** *Landscape & Visual*
- Section 9** *Waste Management*
- Section 10** *Site Inspections*

- Section 11** *Environmental Complaints and Non-Compliance*
- Section 12** *Implementation Status of Mitigation Measures*
- Section 13** *Conclusions and Recommendation*

2. PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 CONSTRUCTION CONTRACT PACKAGING

2.1.1 To facilitate the project management and implementation, the Project was divided by the following contracts:

- Contract 1 (Contract No. CV/2016/10)
- Contract 2 (Contract No. CV/2017/02)
- Contract 3 (Contract No. TBA)

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

2.2 CONSTRUCTION PROGRESS

2.2.1 The three-month rolling construction programme for Contract 1 and Contract 2 are enclosed in [Appendix C](#). Construction activities of the Contract 1 and Contract 2 undertaken in the Reporting Month are presented below. The tentative construction activities are summarised in Section 12.2

Contract 1 (CV/2016/10)

- Compaction works at Footpath
- Directional sign footing construction works
- Drainage & Sewerage Works at RCP
- Drill holes for planting works and fill top soil at CS15,16,17.
- U-channel and planter wall construction works at Cut Slope CS13

Contract 2 (CV/2017/02)

- Construction of Manhole, gullies, drainage pipe at Lin Ma Hang Road between CH0-50 Southbound & CH505-565 Northbound & CH890-960 Northbound
- Pipe Jacking works for DN400 watermain in approx. CH0-300 at Man Kam To Road
- DN400 DI Watermain reinstatement works in approx. CH700-1040 at Man Kam To Road North Slow Lane
- Construction of road works at Sandy Ridge Road E, Road F, Road B
- Fanling Station Road Covered Walkway
- Lung Sum Avenue road surface modification works

2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

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

Table 2-1 Status of Environmental Licenses and Permits for Contract 1

Item	Description	License/ Permit ref no.	License/ Permit Status
1	Air Pollution Control (Construction Dust) Regulation	Ref. no. 428909 Acknowledged by EPD on 20/12/2017	Valid
2	Chemical waste Producer Registration	WPN: 5231-641-H3937-01 Issued by EPD on 27/03/2018	Valid
3	Water Pollution Control Ordinance	License no. WT00030795-2018 Issued date: 9/5/2018 Expire Date: 31/5/2023	Valid
4	Billing Account for Disposal of Construction Waste	Account no.: 7029769	Valid

Table 2-2 Status of Environmental Licenses and Permits for Contract 2

Item	Description	License/ Permit ref no.		License/ Permit Status
1	Air Pollution Control (Construction Dust) Regulation	Ref. no. 440406 Acknowledged by EPD on 14/12/2018	Man Kam To Road (near Sha Ling Road to Kong Nga Po Road)	Valid
		Ref. no. 440405 Acknowledged by EPD on 14/12/2018	Fanling Station Road	Valid
		Ref. no. 440404 Acknowledged by EPD on 14/12/2018	Sa Ling Road (Sandy Ridge Cemetery)	Valid
		Ref. no. 440401 Acknowledged by EPD on 14/12/2018	Lin Ma Hang Road (San Uk Ling – Muk Wu Nga Yiu)	Valid
		Ref. no. 440402 Acknowledged by EPD on 14/12/2018	Lung Sum Avenue (near Landmark North)	Valid
2	Chemical waste Producer Registration	WPN: 5213-641-S4151-01 Issued by EPD on 04/02/2019		Valid
3	Water Pollution Control Ordinance	License no: WT00032936-2018 Issued date: 16/01/2019 Expire Date: 31/01/2024	Man Kam To Road & Lin Ma Hang Road, Man Kam To	Valid
		License no: WT00033335-2019 Issued date: 29/03/2019 Expire Date: 31/03/2024	Columbarium at Sandy Ridge Cemetery	Valid
		License no: WT00034717-2019 Issued date: 9/10/2019 Expire Date: 31/10/2024	Fanling Station Road	Valid
4	Billing Account for Disposal of Construction Waste	Account no.: 7031098		Valid
5	Construction Noise Permit	GW-RN0226-21 (1 May 2021 – 30 Oct 2021)		Valid

2.4 SUMMARY OF SUBMISSION UNDER THE ENVIRONMENTAL PERMIT REQUIREMENTS

2.4.1 *Tables 2-3 to 2-4* summarized the submission status under the EP and/or FEP stipulation in the Reporting Month.

Table 2-3 Status of Submission as under FEP

Item	EP and / or FEP Stipulation	Description	Status
1	Condition 2.10 of FEP	Management organization of : i) the main construction companies; ii) ET; and iii) IEC and the supporting team	Submitted and no approval is required.
2	Condition 2.11 of FEP	i) Detailed phasing programme of all construction works; and ii) Location plan of all construction works	Submitted and no approval is required.
3	Condition 2.12 of FEP	Contamination Assessment Plan (CAP)	Approved by EPD on 27 May 2019
4	Condition 2.13 of FEP	Grassland Reinstatement Plan	Pending approval
5	Condition 2.14 to 2.16 of FEP	Vegetation Survey Report and Vegetation Transplantation Proposal	Approved by EPD on 12 October 2018

Item	EP and / or FEP Stipulation	Description	Status
		for Contract 1	
6	Condition 2.17 of FEP	Woodland Compensation Plan (Rev.05)	Approved by EPD on 30 Jun 2020
7	Condition 2.18 of FEP	Monitoring and Survey Plan for Golden-headed Cisticola for Contract 1 (Rev.02)	Approved by EPD on 22 Oct 2019
8	Condition 2.20 of FEP	Landscape & Visual Mitigation and Tree Preservation Plan(s) Contract 1 (Rev.04)	Pending approval
9	Condition 2.22 of FEP	Traffic Noise Mitigation Plan Contract 1 (Rev. 4)	Pending approval
10	Condition 3.3 of the FEP	Baseline Monitoring Report (Air, Noise and Water)	Approved by EPD on 25 October 2018
11	Condition 4.2 of the FEP	The Contract Internet website	Internet website address has notified EPD on 15 Jun 2018 and no approval is required.

Table 2-4 Status of Submission as under EP

Item	EP and / or FEP Stipulation	Description	Status
1	Condition 2.10 of EP	Management organization of : i) the main construction companies; ii) ET; and iii) IEC and the supporting team	Submitted and no approval is required.
2	Condition 2.11 of EP	i) Detailed phasing programme of all construction works; and ii) Location plan of all construction works	Submitted and no approval is required.
3	Condition 2.12 of EP	Layout Plan for the proposed footpath at Lin Ma Hang Road	Approved by EPD on 25 April 2022
4	Condition 2.13 of EP	Contamination Assessment Plan (CAP)	Approved by EPD on 27 May 2019
5	Condition 2.14 of EP	Grassland Reinstatement Plan	Pending approval
6	Condition 2.15 to 2.17 of EP	Vegetation Survey Report and Vegetation Transplantation Proposal under Contract 2	Approved by EPD on 15 June 2022
7	Condition 2.18 of EP	Woodland Compensation Plan (Rev.05)	Approved by EPD on 30 Jun 2020
8	Condition 2.19 of EP	Monitoring and Survey Plan for Golden-headed Cisticola Contract 2	Pending approval
9	Condition 2.21 – 2.22 of EP	Landscape & Visual Mitigation and Tree Preservation Plan(s) Contract 2	Pending approval
10	Condition 2.23 of EP	Traffic Noise Mitigation Plan Contract 2	Pending approval
11	Condition 3.3 of the EP	Baseline Monitoring Report (Air, Noise and Water)	Approved by EPD on 25 October 2018
12	Condition 4.2 of the EP	The Contract Internet website	Internet website address has notified EPD on 15 June 2018 and no approval is required.

3. SUMMARY OF IMPACT MONITORING REQUIREMENT

3.1 GENERAL

3.1.1 The EM&A requirements are set out in the Approved EM&A Manual. Environmental issues such as air quality, construction noise, water quality and ecology were identified as the key issues during the construction phase of the Project.

3.1.2 A summary of construction phase EM&A requirements are presented in the sub-sections below.

3.2 MONITORING PARAMETERS

3.2.1 The EM&A impact monitoring shall cover the following environmental aspect:

- Air quality;
- Construction noise;
- Water quality;
- Ecology; and
- Landscape and visual

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

Table 3-1 Summary of EM&A Requirements

Environmental Issue	Parameters
Air Quality	<ul style="list-style-type: none"> • 1-hour TSP; • 24-hour TSP
Noise	<ul style="list-style-type: none"> • Leq_(30min) during normal working hours.; and • Leq_(15min) during the construction works undertaken in Restricted Hours
Water Quality	In-situ Measurements <ul style="list-style-type: none"> • Dissolved Oxygen Concentration (mg/L) & Saturation (%); • Temperature (°C); • Turbidity (NTU); • Salinity (ppm) • pH unit; • Water depth (m); and • Stream Flow Velocity (m/sec).
	Laboratory Analysis <ul style="list-style-type: none"> • Suspended Solids (mg/L)
Ecology	Ecologically sensitive habitats (wetland habitats and non-wetland habitats)

3.3 MONITORING LOCATIONS

3.3.1 According to the Approved EM&A Manual of the Project – *Site Formation and Associated Infrastructural Works for Development of Columbarium, Crematorium and Related Facilities at Sandy Ridge Cemetery*, the designated monitoring locations for air quality, noise, water quality and ecology under the monitoring programme, is shown in *Appendix D*.

3.3.2 Since the Project was divided into three Works Contracts and all Contracts will be commenced at different time, the construction phase impact monitoring will only be performed at the Contract-related monitoring stations upon commencement of each Contract Works.

Air Quality

3.3.3 There were three (3) designated air quality monitoring stations recommended in the Approved EM&A Manual Section 5.6.1.1. There was proposed relocation of air quality monitoring location ASR-3 in October 2018 since the landlord refused to set up the HVS at his premises and nearby Conservation Area due to noise nuisance and Muk Wu Nga Yiu House No. 2A was proposed as alternative location ASR-3a. The proposal dated on 9 November 2018 which verified by IEC was submitted to EPD for approval. Based on rationale in Section 3.3.2, the Contract-related air quality monitoring location for construction phase were summarized in *Table 3-2* and illustrated in *Appendix D*.

Table 3-2 Designated Air Quality Monitoring Location under the Project

Location ID	Description in EM&A Manual	Location	Related Work Contract
ASR-1	Village House along Man Kam To Road	Sha Ling Village House No.6	Contract 1
ASR-2	Village House at San Uk Ling	San Uk Ling Village House No.1	Contract 2
ASR-3	Village House at Muk Wu Nga Yiu	Muk Wu Nga Yiu House No.28	Contract 2
ASR-3a (#)	Village House at Muk Wu Nga Yiu	Muk Wu Nga Yiu House No.2A	Contract 2

Remark: (#) There was proposed relocation of air quality monitoring location ASR-3 in October 2018. The proposal dated on 9 November 2018 after verified by IEC was submitted to EPD for approval.

3.3.4 If the designated monitoring location is required to relocate, alternative monitoring location shall agree with IEC and seek for EPD approval which shall meet the following criteria:

- i) Be at the site boundary or such locations close to the major dust emission source;
- ii) Close to the sensitive receptors;
- iii) Take into account the prevailing meteorological conditions;
- iv) For monitoring location located in the vicinity of the ASRs, care shall be taken to cause minimal disturbance to the occupants during monitoring.
- v) When positioning the HVS, the following points shall be noted:
 - a. a horizontal platform with appropriate support to secure the samples against gusty wind shall be provided;
 - b. no two samplers shall be placed less than 2m apart;
 - c. the distance between the HVS and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the HVS;
 - d. a minimum of 2 m separation from walls, parapets and penthouses is required for HVS at the rooftop;
 - e. a minimum of 2 m separation from any supporting structure, measures horizontally is required;
 - f. no furnace or incinerator flue is nearby;
 - g. airflow around the sampler is unrestricted;
 - h. the HVS is more than 20 m from the dripline;
 - i. any wire fence and gate to protect the HVS, shall not cause any obstruction during monitoring;
 - j. permission must be obtained to set up the HVS and to obtain access to the monitoring stations; and
 - k. a secured supply of electricity is needed to operate the HVS.

Construction Noise

3.3.5 There were four (4) designated noise monitoring locations recommended in the Approved EM&A Manual Section 6.5.1.1. Based on rationale in Section 3.3.2, the Contract-related noise quality monitoring location for construction phase were summarized in **Table 3-3** and illustrated in **Appendix D**.

Table 3-3 Designated Construction Noise Monitoring Location under the Project

Location ID	Description in EM&A Manual	Location	Related Work Contract
CN-1	Village house to the west of Sha Ling Road	Village house to the west of Sha Ling Road (free field condition)	Contract 1
CN-2	Village house to the north of Man Kam To Road	Sha Ling Village House No. 25 (free field condition)	Contract 1 & 3
CN-3	Village house near San Uk Ling	San Uk Ling Village House No. 18 (free field condition)	Contract 2
CN-4	Village house of Muk Wu	Muk Wu Village House No. 267 (1m façade from the building)	Contract 2

Water Quality

3.3.6 There were four (4) water quality monitoring locations recommended in the Approved EM&A Manual Section 7.6.1.2. The locations and coordinates of water quality monitoring were listed in **Table 3-4**. Based on rationale in Section 3.3.2, the Contract-related water quality monitoring location for construction phase were summarized in **Table 3-4** and illustrated in **Appendix D**.

Table 3-4 Designated Water Quality Monitoring Stations under the Project

Proposed Location ID	Co-ordinates		Description	Related Work Contract
	North	East		
M1	843 431	831 308	Midstream of Nam Hang Stream	Contract 2
M2	843 840	831 101	Downstream of Nam Hang Stream	Contract 2
M3	843 509	830 040	Wetland in the Conservation Area near Yuen Leng Chai	Contract 1
M4	843 997	831 783	Watercourse across Lin Ma Hang Road, running from east of San Uk Ling to Man Kam To Boundary Control Point	Contract 2

3.4 MONITORING FREQUENCY AND PERIOD

3.4.1 The requirements of impact monitoring were stipulated in *Sections 5.8.1.1, 6.7.1.1 and 7.8.1.4* of the approved *EM&A Manual* and presented as follows.

Air Quality Monitoring

3.4.2 Monitoring frequency for air quality impact monitoring is as follows:

- 1-Hour TSP 3 sets of 1-hour TSP monitoring shall be carried out once every six days during construction periods
- 24-Hour TSP 24-hour TSP monitoring shall be carried out every six days during construction periods

Noise Monitoring

3.4.3 Noise impact monitoring shall be carried out once per week during construction periods. The noise measurement for the time period between 0700 and 1900 hours shall be measured in terms of L_{eq} (30 minutes) or 6 sets of L_{eq} (5mins).

Water Quality Monitoring

3.4.4 The monitoring frequency shall be 3 days per week during construction phase and the interval between two sets of monitoring shall not be less than 36 hours.

3.5 MONITORING EQUIPMENT

3.5.1 The monitoring equipment using for the EM&A program as proposed by the ET shall be verified by the IEC.

Air Quality Monitoring

3.5.2 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B*. If ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to IEC for approval.

3.5.3 The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.

3.5.4 All equipment used by ET for air quality monitoring is listed in **Table 3-5**.

Table 3-5 Air Quality Monitoring Equipment

Equipment	Model
24-hour TSP	
High Volume Air Sampler (HVAS)	TISCH High Volume Air Sampler, HVS Model TE-5170
Calibration Kit	TISCH Model TE-5025A
1-Hour TSP	
Portable Dust Meter	Laser Dust Monitor, Model AM510

Equipment	Model
	/ Sibata LD-3 Laser Dust monitor Particle Mass Profiler & Counter

Wind Data Monitoring Equipment

- 3.5.5 According to the approved EM&A Manual, wind data monitoring equipment shall also be provided and set up for logging wind speed and wind direction near the dust monitoring locations. The equipment installation location shall be proposed by the ET and agreed with the IEC. For installation and operation of wind data monitoring equipment, the following points shall be observed:
- 1) The wind sensors should be installed 10 m above ground so that they are clear of obstructions or turbulence caused by buildings.
 - 2) The wind data should be captured by a data logger. The data shall be downloaded for analysis at least once a month.
 - 3) The wind data monitoring equipment should be re-calibrated at least once every six months.
 - 4) Wind direction should be divided into 16 sectors of 22.5 degrees each.
- 3.5.6 ET has liaised with the premises owners/ landlords to grant the permission for the HVS installation. However, they rejected to set up wind data monitoring equipment installation in their premises.
- 3.5.7 Under this situation, the ET proposed to obtain representative wind data from the Hong Kong Observatory Ta Kwu Ling Weather Station. Ta Kwu Ling Station is located near the Project site which situated at the sea level above 15mPD and the wind data monitoring equipment is installed 10 m above the existing ground.

Noise Monitoring

- 3.5.8 Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in ms⁻¹ before each noise monitoring event. Noise measurements should not be made in fog, rain, wind with a steady speed exceeding 5 m s⁻¹ or wind with gusts exceeding 10 m s⁻¹.
- 3.5.9 Noise monitoring equipment used for impact monitoring is listed in **Table 3-6**.

Table 3-6 Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	Rion NL-52 Sound Level Meter
Calibrator	Rion NC-74 Acoustical Calibrator
Portable Wind Speed Indicator	Testo Anemometer

- 3.5.10 Sound level meters listed above comply with the *International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1)* specifications, as recommended in TM issued under the NCO.

Water Quality Monitoring

- 3.5.11 Water quality parameters include dissolved oxygen, water temperature & depth, turbidity, salinity, pH and stream flow velocity shall be measured *in-situ*, and suspended solids shall be analyzed by a HOKLAS-accredited testing laboratory.

Dissolved Oxygen and Temperature Measurement

- 3.5.12 The dissolved oxygen (DO) measuring instruments should be portable and weatherproof. The equipment should also complete with cable and sensor, and DC power source. It should be capable of measuring:
- A DO level in the range of 0 – 20 mg/L and 0 – 200% saturation; and
 - A temperature of 0 – 45 degree Celsius.

- 3.5.13 The equipment should have a membrane electrode with automatic temperature compensation complete with a cable.
- 3.5.14 Should salinity compensation not be built-in to the DO equipment, in-situ salinity should be measured to calibrate the DO measuring instruments prior to each measurement.

Turbidity Measurement

- 3.5.15 The turbidity measuring instruments should be a portable and weatherproof with DC power source. It should have a photoelectric sensor capable of measuring turbidity level between 0–1000 NTU (for example, Hach model 2100Q or an approved similar instrument).

Salinity Measurement

- 3.5.16 A portable salinometer capable of measuring salinity in the range of 0–40 parts per thousand (ppt) should be provided for measuring salinity of the water at each monitoring location.

pH Measurement

- 3.5.17 A portable pH meter capable of measuring a range between 0.0 and 14.0 should be provided to measure pH under the specified conditions accordingly to the APHA Standard Methods.

Water Depth Measurement

- 3.5.18 A portable, battery-operated echo sounder or an approved similar instrument should be used for water depths determination at each designated monitoring station.

Stream Flow Velocity Equipment

- 3.5.19 Since the EM&A Manuals do not specified instrument to use stream flow velocity measurement, the monitoring of stream flow velocity is therefore proposed to be conducted by using a flow probe which is a digital water velocity meter.

Water Sampling Equipment

- 3.5.20 A water sampler is required for suspended solid (SS) monitoring. A water sampler e.g. Kahlsico Water Sampler, which is a transparent PVC cylinder with capacity not less than 2 litres, will be used for water sampling if water depth over than 0.5m.
- 3.5.21 For sampling from very shallow water depths e.g. <0.5 m, water sample will be collected from water surface below 100mm using plastic bottle to avoid inclusion of bottom sediment or humus. Moreover, Teflon/stainless steel bailer or self-made sampling buckets maybe used for water sampling. The equipment used for sampling will be depended the sampling location and depth situations.

Sample Containers and Storage

- 3.5.22 Water samples for suspended solid should be stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen) and delivered to the laboratory within 24 hours of collection and be analyzed as soon as possible after collection.
- 3.5.23 Analysis of suspended solids should be carried out in a HOKLAS or other accredited laboratory. Water samples of about 1L should be collected at the monitoring stations for carrying out the laboratory suspended solids determination. The SS determination work should start within 24 hours after collection of the water samples. The SS analyses should follow the *APHA Standard Methods 2540D* with Limit of Reporting of 2 mg/L.

- 3.5.24 Details of the equipment used for water quality monitoring are listed in **Table 3-7** below.

Table 3-7 Water Quality Monitoring Equipment

Equipment	Model
Water Depth Detector	Tape measures

Equipment	Model
Water Sampler	A 2-litre transparent PVC cylinder with latex cups at both ends or Teflon/stainless steel bailer or self-made sampling bucket
Thermometer & DO meter	YSI Professional Plus/ YSI 550A
pH meter	AZ8685 pH meter / YSI Professional Plus / YSI Professional DSS
Turbidimeter	Hach 2100Q/ YSI Professional Plus / YSI Professional DSS
Salinometer	Atago refractometer Atago S Salinity Meter / YSI Professional Plus / YSI Professional DSS
Stream Flow Velocity	FP211 Global Flow Probe
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-litter plastic cool box with Ice pad

3.5.25 Furthermore, Suspended solids (SS) analysis was carried out by *ALS Technichem (HK) Pty Ltd.* Which is one a local HOKLAS-accredited laboratory

3.6 EQUIPMENT CALIBRATION

3.6.1 The HVAS is operated and calibrated on a regular basis in accordance with the manufacturer's instruction using Tisch Calibration Kit Model TE-5025A. Calibration would carry out at fortnightly interval. The calibration data are properly documented and the records are maintained by ET for future reference. Furthermore, Tisch Calibration Kit will be calibrated by the manufacturer in yearly basis.

3.6.2 The 1-hour TSP meter calibrated by a local HOKLAS-accredited laboratory would be undertaken in yearly basis. Zero response of the equipment was checked before and after each monitoring event.

3.6.3 The sound level meter and acoustic calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme at yearly basis.

3.6.4 The multi-parameter Water Quality Monitoring System is calibrated by HOKLAS accredited laboratory of three month intervals.

3.6.5 All updated calibration certificates of the monitoring equipment used for the impact monitoring program in this Reporting Month are attached in [Appendix E](#).

3.7 DATA MANAGEMENT AND DATA QA/QC CONTROL

3.7.1 The impact monitoring data are handled by the ET's systematic data recording and management, which complies with in-house Quality Management System. Standard Field Data Sheets (FDS) are used in the impact monitoring program.

3.7.2 The monitoring data recorded in the equipment e.g. 1-hour TSP meter, noise meter and Multi-parameter Water Quality Monitoring System are downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data are input into a computerized database properly maintained by the ET. The laboratory results are input directly into the computerized database and QA/QC checked by personnel other than those who input the data. For monitoring activities require laboratory analysis, the local laboratory follows the QA/QC requirements as set out under the HOKLAS scheme for all laboratory testing.

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

3.8.1 The baseline monitoring results form the basis for determining the environmental acceptance criteria for the impact monitoring. The air quality, construction noise and water quality criteria, namely Action and Limit levels were established according to Approved EM&A Manual, and they are listed in *Tables 3-8, 3-9 and 3-10* below.

Table 3-8 Action and Limit Levels for Air Quality Monitoring

Monitoring Station	Action Level ($\mu\text{g}/\text{m}^3$)		Limit Level ($\mu\text{g}/\text{m}^3$)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
ASR-1	331	181	500	260

Monitoring Station	Action Level ($\mu\text{g}/\text{m}^3$)		Limit Level ($\mu\text{g}/\text{m}^3$)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
ASR-2	316	165	500	260
ASR-3	307	160	500	260

Table 3-9 Action and Limit Levels for Construction Noise

Monitoring Location	Action Level	Limit Level in dB(A)
	Time Period: 0700-1900 hours on normal weekdays	
CN-1,CN-2, CN-3, CN-4	When one or more documented complaints are received	75 dB(A)

Note: * Reduces to 70 dB(A) for schools and 65 dB(A) during the school examination periods.

Table 3-10 Action and Limit Levels for Water Quality

Parameter	Performance criteria	Monitoring Location			
		M1	M2	M3	M4
DO (mg/L)	Action Level	3.03	4.99	4.58	3.62
	Limit Level	2.97	4.90	4.49	3.52
Turbidity (NTU)	Action Level	7.1	39.7	5.6	5.4
	Limit Level	7.6	42.2	5.9	5.9
SS (mg/L)	Action Level	8.5	29.0	9.3	4.8
	Limit Level	10.1	31.0	9.5	5.0

Notes:

- For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits
- For turbidity and SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

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

4. AIR QUALITY

4.1 MONITORING RESULTS

4.1.1 In the Reporting Month, air quality monitoring was performed at all designated locations. Impact monitoring schedule provided to all relevant parties was shown in [Appendix G](#).

4.1.2 In this Reporting Month, there were **6** sessions of 24-hour TSP and **18** sessions of 1-hour TSP undertaken at each designated station for air quality monitoring. The air quality monitoring results are summarized in [Tables 4-1](#) to [4-3](#). The database of 24-hour TSP is shown in [Appendix H](#) and the graphical plots of monitoring result are shown in [Appendix I](#).

Table 4-1 Summary of Air Quality Monitoring Results at ASR-1 under Contract 1

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st hour measured	2 nd hour measured	3 rd hour measured
1-Jun-22	32	2-Jun-22	13:00	91	88	96
7-Jun-22	10	8-Jun-22	13:02	39	41	43
13-Jun-22	31	14-Jun-22	9:20	72	70	81
18-Jun-22	32	20-Jun-22	13:04	89	84	77
24-Jun-22	36	25-Jun-22	9:35	101	98	96
29-Jun-22	46	30-Jun-22	13:30	71	66	76
Average (Range)	31 (10 – 46)	Average (Range)		77 (39 – 101)		

Table 4-2 Summary of Air Quality Monitoring Results at ASR-2 under Contract 2

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st hour measured	2 nd hour measured	3 rd hour measured
1-Jun-22	63	2-Jun-22	13:07	111	102	122
7-Jun-22	38	8-Jun-22	13:10	46	51	44
13-Jun-22	52	14-Jun-22	9:35	88	92	97
18-Jun-22	75	20-Jun-22	13:11	76	82	85
24-Jun-22	76	25-Jun-22	9:41	103	101	93
29-Jun-22	44	30-Jun-22	13:36	63	70	66
Average (Range)	58 (38 – 76)	Average (Range)		83 (44 – 122)		

Table 4-3 Summary of Air Quality Monitoring Results at ASR-3a under Contract 2

Date	24-hour TSP ($\mu\text{g}/\text{m}^3$)	1-hour TSP ($\mu\text{g}/\text{m}^3$)				
		Date	Start Time	1 st hour measured	2 nd hour measured	3 rd hour measured
1-Jun-22	25	2-Jun-22	13:15	81	88	73
7-Jun-22	25	8-Jun-22	13:16	38	36	42
13-Jun-22	18	14-Jun-22	9:41	68	71	76
18-Jun-22	14	20-Jun-22	13:21	78	73	82
24-Jun-22	18	25-Jun-22	9:47	91	93	90
29-Jun-22	13	30-Jun-22	13:43	58	51	55
Average (Range)	19 (13 – 25)	Average (Range)		69 (36 – 93)		

4.2 AIR MONITORING EXCEEDANCE

4.2.1 As shown in [Tables 4-1](#) to [4-3](#), the monitoring results of 24-hour and 1-hour TSP monitoring in the Reporting Month were below the Action/ Limit Level. No Notification of Exceedance (NOE) of air quality monitoring criteria was issued and therefore corrective action was not required. The meteorological data during the impact monitoring days are summarized in [Appendix J](#).

5. CONSTRUCTION NOISE

5.1 MONITORING RESULTS

- 5.1.1 In the Reporting Month, noise monitoring was performed at all designated locations. Impact monitoring schedule provided to all relevant parties was shown in [Appendix G](#).
- 5.1.2 In this Reporting Month, 5 sessions of noise monitoring were undertaken at each designated noise monitoring location. The sound level were set in a free field situation for CN1, CN2 and CN3 and therefore a façade correction of +3dB(A) has been added according to acoustical principles and EPD guidelines. The monitoring result of noise monitoring is show in [Tables 5-1 and 5-2](#) and the graphical plots are shown in [Appendix I](#).

Table 5-1 Summary of Construction Noise Monitoring Results under Contract 1

Construction Noise Level ($L_{eq30min}$), dB(A)				
Date	Start Time	CN1(*)	Start Time	CN2(*)
2-Jun-22	13:12	60	13:48	63
8-Jun-22	13:00	60	13:36	63
14-Jun-22	13:00	59	13:47	61
20-Jun-22	9:32	59	10:09	62
30-Jun-22	9:36	69	10:10	61
Limit Level	75 dB(A)			

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

Table 5-2 Summary of Construction Noise Monitoring Results under Contract 2

Construction Noise Level ($L_{eq30min}$), dB(A)				
Date	Start Time	CN3(*)	Start Time	CN4
2-Jun-22	13:23	64	13:58	64
8-Jun-22	14:15	68	14:56	64
14-Jun-22	14:25	62	15:08	63
20-Jun-22	10:45	68	11:21	64
30-Jun-22	10:47	64	11:24	55
Limit Level	75 dB(A)			

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

- 5.1.3 Prior and after noise monitoring, the accuracy of the sound level meter has been checked by an acoustic calibrator to ensure the measurement within acceptance range of ± 0.5 dB. Moreover, wind speed checked by portable wind speed meter has been performed before noise monitoring. No noise measurement was performed in fog, rain, wind with a steady speed exceeding 5 m s^{-1} or wind with gusts exceeding 10 m s^{-1} .

5.2 NOISE MONITORING EXCEEDANCE

- 5.2.1 As shown in [Tables 5-1 and 5-2](#), no noise complaint (which triggered Action Level) and Limit Level exceedance for noise monitoring exceedance was recorded in the Reporting Month.

6. WATER QUALITY

6.1 MONITORING RESULTS

- 6.1.1 In the Reporting Month, water quality monitoring was performed at all designated locations. Impact monitoring schedule provided to all relevant parties was shown in [Appendix G](#).
- 6.1.2 In the Reporting Month, a total of **13** monitoring days were carried out for water quality impact monitoring. Besides, the channel of M2 was dried up / too shallow on 24 June 2022 and representative water sampling was unable to be carried out. Notification was provided to relevant parties in the following days of the events.
- 6.1.3 The monitoring result of key parameters including Dissolved Oxygen, Turbidity and Suspended Solids are summarized in [Tables 6-1](#) and [6-2](#). Detailed monitoring results including in-situ measurements and laboratory analysis data are shown in [Appendix H](#) and graphical plots for monitoring result are shown in [Appendix I](#).

Table 6-1 Summary of Water Quality Monitoring Results – M3 under Contract 1

Date	Parameters		
	DO (Averaged) (mg/L)	Turbidity (Averaged) (NTU)	Suspended Solids (Averaged) (mg/L)
1-Jun-22	6.87	5.4	5.5
4-Jun-22	6.75	4.0	3.0
6-Jun-22	6.37	4.2	2.5
8-Jun-22	6.84	2.7	2.0
10-Jun-22	7.03	5.3	6.0
13-Jun-22	6.59	5.5	7.5
15-Jun-22	6.75	5.5	6.5
17-Jun-22	6.20	3.5	6.0
20-Jun-22	6.89	1.7	2.5
22-Jun-22	6.62	3.1	4.5
24-Jun-22	7.73	1.6	3.5
27-Jun-22	7.62	4.3	2.5
29-Jun-22	5.92	2.5	7.0

Table 6-2 Summary of Water Quality Monitoring Results (M1, M2 and M4) under Contract 2

Date	Parameters								
	DO (Averaged) (mg/L)			Turbidity (Averaged) (NTU)			Suspended Solids (Averaged) (mg/L)		
	M1	M2	M4	M1	M2	M4	M1	M2	M4
1-Jun-22	6.84	5.43	5.68	4.0	14.6	4.7	5.5	11.5	4.5
4-Jun-22	6.98	5.61	6.16	2.7	12.7	3.4	5.5	9.5	4.5
6-Jun-22	6.92	5.00	6.22	1.9	2.0	2.8	5.0	4.5	4.5
8-Jun-22	7.00	6.86	3.99	3.0	14.7	5.1	5.5	15.5	4.5
10-Jun-22	7.03	5.54	6.23	9.6	16.5	6.5	15.0	12.5	6.5
13-Jun-22	7.02	5.91	6.61	4.0	65.7	6.1	5.0	136.5	6.5
15-Jun-22	7.19	7.05	4.58	14.7	14.8	1.7	12.0	25.5	2.5
17-Jun-22	6.98	6.49	4.74	8.5	11.8	2.3	12.0	20.0	3.5
20-Jun-22	6.93	6.43	5.56	3.4	17.5	3.6	4.0	26.0	4.5
22-Jun-22	6.15	6.55	6.10	6.4	16.7	5.0	6.5	27.5	4.0
24-Jun-22	6.31	#	4.51	5.7	#	1.0	5.5	#	<2
27-Jun-22	6.93	7.22	4.37	4.4	8.5	3.4	3.0	8.0	3.5
29-Jun-22	6.85	7.01	6.40	6.3	10.6	2.3	6.5	8.0	2.5

Remarks: (#) The channel of M2 was dried up / too shallow and representative water sampling was unable to be carried out; Bold and underlined value indicated Limit Level exceedance

6.1.4 During the Reporting Month, field measurements including temperature of stream water, salinity concentrations, pH values and the stream flow velocity for all monitoring locations are summarized in [Table 6-3](#).

Table 6-3 Summary of Field Measurements for Water Quality

Monitoring Location	Parameters of field measurements							
	pH (Averaged) (unit)		Salinity (Averaged) (ppt)		Temp (Averaged) (°C)		Water Flow (Averaged) (m/s)	
	min	max	min	max	min	max	min	max
M1	7.0	8.1	0.03	0.07	24.1	27.0	<0.1	<0.1
M2	7.2	7.7	0.03	0.09	24.6	26.6	<0.1	<0.1
M3	7.0	7.5	0.01	0.02	24.5	26.7	<0.1	<0.1
M4	6.8	7.7	0.04	0.12	24.8	27.3	<0.1	<0.1

6.2 WATER QUALITY MONITORING EXCEEDANCE

6.2.1 In this Reporting Month, a total of **12** Limit level exceedances, namely **6** exceedance of Turbidity and **6** exceedances of SS were recorded. The non-compliance of water quality performance is summarized in [Table 6-4](#).

Table 6-4 Action and Limit (A/L) Levels Exceedance Record

Station	DO		Turbidity		SS		Total Exceedance		Project Related exceedance	
	Action	Limit	Action	Limit	Action	Limit	Action	Limit	Action	Limit
M1	0	0	0	3	0	3	0	6	0	0
M2	0	0	0	1	0	1	0	2	0	0
M3	0	0	0	0	0	0	0	0	0	0
M4	0	0	0	2	0	2	0	4	0	0

6.2.2 Notification of Exceedance (NOE) and the investigation for exceedance in the Reporting Month is summarized in [Table 6-5](#).

Table 6-5 Summary of Investigation of Water Quality Exceedance in the Reporting Month

Date of Exceedance	Exceeded Location	Exceeded Parameter	Cause of Water Quality Exceedance
10 June 2022	M1	Turbidity & Suspended Solids	According to the weather data from Observatory, there were successive rainstorms during 10 to 13 June 2022, in which Amber Rainstorm Warning Signal was issued on 11 June 2022. Under the influence of rain, the water quality of seasonal watercourse was inevitably be affected by the stirred up sediment and erosion from the surrounding environment even outside the construction site.
13 June 2022	M2	Turbidity & Suspended Solids	Site inspections were conducted on 9 and 16 June 2022 and no adverse water quality impact was observed at the works area on Man Kam To Road. Road work was carried out at Lin Ma Hang Road near M4, but there was no discharge in view of the work nature and no adverse water quality impact was observed after rainy day.
10 and 13 June 2022	M4	Turbidity & Suspended Solids	
15 and 17 June 2022	M1	Turbidity & Suspended Solids	There were no active work areas under the near Locations M1 and M2. It was considered that the exceedances were related to the impact of rainstorm and unlikely caused by the work under the project.
			According to the weather data from Observatory, there were successive rainstorms during 14 to 16 June 2022. Under the influence of rain, the water quality of seasonal watercourse was inevitably be affected by the stirred up sediment and erosion from the surrounding environment

Date of Exceedance	Exceeded Location	Exceeded Parameter	Cause of Water Quality Exceedance
			<p>even outside the construction site. Site inspection was conducted on 16 June 2022. It was noticed that there were no active work areas under the near Location M1. Road work was carried out at other section in Lin Ma Hang Road, but there was no discharge in view of the work nature and no adverse water quality impact was observed after rainy day.</p> <p>Since there were no active work areas conducted near Location M1, it was considered that the exceedances were related to the impact of rainstorm and unlikely caused by the work under the project.</p>

7. ECOLOGY MONITORING

7.1 REQUIREMENT

7.1.1 According to approved EIA report (AEIAR-198/2016), habitat types within project boundary comprise of watercourse, grassland, upland grassland, plantation, woodland and developed area. Natural habitats were of moderate ecological value in terms of species diversity, species rarity, species abundance, ecological linkage as well as nursery. Moreover, 0.3ha of wet woodland on the northern side of Sandy Ridge was deemed habitat with high ecological value. Four types of habitats were regarded as ecologically sensitive habitats, namely wet woodland, watercourses, upland grassland and woodland. Considering human disturbance in upcoming construction and operation phases, ecologically sensitive habitats shall be monitored in accordance with EM&A Manual.

7.1.2 The objective of ecologically sensitive habitats monitoring is to evaluate the effectiveness of measures to minimize impacts on concerned habitats from disturbance and pollution. In order to monitor the effectiveness of the measures to the minimize impact on ecologically sensitive habitats from disturbance and pollution, monthly monitoring during construction and operation phases is required as specified in EM&A Manual. Standard faunal transect and sampling surveys cover both wetland habitats (*wet woodland and watercourse*) and non-wetland habitats (*upland grassland and woodland*).

7.2 METHODOLOGY

7.2.1 Wetland habitats include wet woodland and watercourses. Monitoring surveys using standardized quantitative methodology will conduct at fixed points. For seasonal watercourse, the survey will be conducted whenever the habitat appears. Measures to respond to decreases in numbers of aquatic fauna using the wetland habitats and Action/Limit levels to trigger these measures are detailed in **Table 7-1**.

Table 7-1 Action and Limit Levels for Wet Woodland Habitats Monitoring

Action Level	Response	Limit Level	Response
Reduction in taxa diversity by 30%	Investigate cause and if cause identified as related to the project instigate remedial action to remove or reduce source of disturbance.	Reduction in taxa diversity by 50%	Investigate cause and if cause identified as related to the project instigate remedial action.

Remarks: Action and Limit Levels and Responses to Evidence of Declines in Aquatic Fauna

7.2.2 Non-wetland habitats consist of upland grassland and woodland. Monthly quantitative surveys of non-aquatic fauna will be conducted using standard route transect counts. Measures to respond to decreases in numbers of non-aquatic fauna using the non-wetland habitats and Action/Limit levels to trigger these measures are detailed in **Table 7-2**.

Table 7-2 Action and Limit Levels for Non-Wet Woodland Habitats Monitoring

Action Level	Response	Limit Level	Response
Reduction in species diversity by 30%	Investigate cause and if cause identified as related to the project instigate remedial action to remove or reduce source of disturbance.	Reduction in species diversity by 50%	Investigate cause and if cause identified as related to the project instigate remedial action.

Remarks: Action and Limit Levels and Responses to Evidence of Declines in Non-Aquatic Fauna

7.2.3 The ecological survey includes all taxa being investigated in accordance with EIA report. Schedule of faunal surveys in each year during construction phase is presented in **Table 7-3**.

Table 7-3 Schedule of Faunal Surveys in each year During Construction Phase

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mammals	√	√	√	√	√	√	√	√	√	√	√	√
Birds (day)	√	√	√	√	√	√	√	√	√	√	√	√

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Birds (night)				√	√	√	√	√	√	√		
Herpetofauna				√	√	√	√	√	√	√		
Dragonflies			√	√	√	√	√	√	√	√		
Butterflies			√	√	√	√	√	√	√	√		
Aquatic fauna	√	√	√	√	√	√	√	√	√	√	√	√

Mammal Survey

7.2.4 Mammal surveys will be conducted along the proposed transects (shown in **Appendix K** - Ecological Survey Reports) in during both daytime and night time periods. Along with direct observations, other field signs, such as scats and tracks, will be searched and recorded if present.

Bird Survey

7.2.5 Bird surveys will be conducted along the transects (shown in **Appendix K** - Ecological Survey Reports) during the surveys, species and their vocalizing individuals recorded will be enumerated and recorded according to the habitat(s) they are utilizing.

Herpetofauna Survey

7.2.6 Reptile and amphibian surveys will be conducted along transects (shown in **Appendix K** - Ecological Survey Reports) during surveys careful searches of appropriate microhabitats and refugia for reptiles and their vocalizing individuals will be undertaken and all reptiles observed will be identified and counted.

Dragonfly and Butterfly Survey

7.2.7 Dragonfly and Butterfly surveys will be conducted along transects (shown in **Appendix K** - Ecological Survey Reports) during surveys all dragonflies and Butterflies seen will be identified and counted as accurately as possible.

Aquatic Fauna Survey

7.2.8 Freshwater fishes and macro-invertebrates will be recorded by direct observation. All species trapped/recorded will be enumerated and identified (to the lowest taxonomic level possible), and the species of conservation importance photographed.

7.2.9 After each ecological monitoring survey, a monthly report of the survey result and data collected will be provided with reference to EM&A Manual. An annual analysis of data will be carried out in order to study if there is any significant reduction in taxa diversity and abundance.

7.3 ECOLOGICAL MONITORING SURVEY FINDINGS (CONTRACT 1)

7.3.1 In the Reporting Month, ecological monitoring was undertaken on **14th June 2022**, a sunny day. The day survey covered wetland and non-wetland areas. The survey was conducted by transect and at fixed points. All species seen will be identified and counted as accurately as possible. Results of the monitoring survey are presented below:

Monitoring Result for Contract 1

Mammal

7.3.2 There was one mammal species of conservation interests recorded in the monitoring area: Eurasian Wild Pig (*Sus scrofa*) 野豬.

Birds

7.3.3 There were a total of 36 bird individuals from 11 species recorded in the monitoring area. No Golden-headed Cisticola was observed during the bird survey. Two species of conservation interests was recorded in this survey: Lesser Coucal (*Centropus bengalensis*) 小鴉鶻 and Black Kite (*Milvus migrans*) 黑鳶.

Herpetofauna

7.3.4 There was no reptile species recorded in monitoring area. There were 3 amphibian species recorded in the monitoring area.

Butterfly

7.3.5 There were a total of 4 butterfly individuals from 2 species recorded in the monitoring area. One species of conservation interests was recorded in this survey: Scarlet Dwarf (*Nannophya pygmaea*) 侏紅小蜻.

Dragonfly

7.3.6 There were a total of 17 odonate individuals from 6 species recorded in the monitoring area.

Aquatic Fauna Survey (Freshwater communities)

7.3.7 There was no freshwater community recorded in the monitoring area.

7.3.8 The summaries of faunal survey result are shown in **Tables 7-4** and **7-5**.

Table 7-4 Result of Faunal Survey under Contract 1

Scientific Name	Common / Engineer Name	Chinese Name	Conservation Status	Non-wetland		Wetland		
				UG	WL	MA	WWWC	
Mammal Survey								
<i>Sus scrofa</i>	Eurasian Wild Pig	野豬	Fellowes et al. (2002): (PRC)	2				
Avifauna Survey								
<i>Francolinus pintadeanus</i>	Chinese Francolin	中華鷓鴣		1				
<i>Milvus migrans</i>	Black Kite	黑鳶	Fellowes et al. (2002): (RC); Appendix 2 of CITES	2				
<i>Spilopelia chinensis</i>	Spotted Dove	珠頸斑鳩		2	2			
<i>Centropus bengalensis</i>	Lesser Coucal	小鴉鵂	Class 2 Protected Animal of China; China Red Data Book Status: (Vulnerable)	1				
<i>Pycnonotus jocosus</i>	Red-whiskered Bulbul	紅耳鶇		4			3	
<i>Pycnonotus sinensis</i>	Chinese Bulbul	白頭鶇					2	
<i>Pycnonotus aurigaster</i>	Sooty-headed Bulbul	白喉紅臀鶇					3	
<i>Prinia flaviventris</i>	Yellow-bellied Prinia	黃腹鷓鴣			1		1	
<i>Orthotomus sutorius</i>	Common Tailorbird	長尾縫葉鶇			2			
<i>Garrulax perspicillatus</i>	Masked Laughingthrush	黑臉噪鶇		8				
<i>Motacilla alba</i>	White Wagtail	白鶇鶇					4	
Reptile Survey								
--	--	--	--	--	--	-	--	--
Amphibian Survey								
<i>Kaloula pulchra</i>	Asiatic Painted Frog	花狹口蛙						+
<i>Fejervarya limnocharis</i>	Paddy Frog	澤蛙						+
<i>Polypedates megacephalus</i>	Brown Tree Frog	斑腿泛樹蛙						+
<i>Abisara echerius</i>	Plum Judy	蛇目褐蛺蝶		2				
<i>Catopsilia pomona</i>	Lemon Emigrant	遷粉蝶		2				

Scientific Name	Common / Engineer Name	Chinese Name	Conservation Status	Non-wetland		Wetland		
				UG	WL	MA	WW	WC
Odonate Survey								
<i>Onychargia atrocyana</i>	Marsh Dancer	毛面同痣蟴						2
<i>Ceriagrion auranticum</i>	Orange-tailed Sprite	翠胸黃蟴						8
<i>Brachydiplax chalybea</i>	Blue Dasher	藍額疏脈蜻						2
<i>Pantala flavescens</i>	Wandering Glider	黃蜻						1
<i>Nannophya pygmaea</i>	Scarlet Dwarf	侏紅小蜻						3
<i>Macromidia rapida</i>	Common Shadow-emerald	颯中偽蜻						1

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse

Table 7-5 Result of Freshwater Communities Survey under Contract 1

Scientific Name	Common Name	Chinese Name	Conservation Status	Non-wetland		Wetland		
				UG	WL	MA	WW	WC
--	--	--	--	--	--	--	--	--

Discussion

7.3.9 After analysing survey results in June from 2019 to 2022, there was no significant drop in species richness and abundance for wetland habitat. The reduction could be due to natural fluctuation. Yet, good site practice during construction, with reference to EM&A Manual, is required to prevent or alleviate environmental impacts. For instance, the size of work areas should be minimized and disturbed areas should be reinstated immediately after completion of construction works. Unnecessary site clearance should be avoided as well. In addition, implementing proper waste disposal is necessary to reduce contamination to water and soil. Continuous monitoring is also recommended to inspect any significant decrease in species diversity.

7.4 ECOLOGICAL MONITORING SURVEY FINDINGS (CONTRACT 2)

7.4.1 In the Reporting Month, ecological monitoring was undertaken on **14th June 2022** at work area of Contract 2. A sunny day covered wetland and non-wetland areas. The survey was conducted by transect and at fixed point. All species seen will be identified and counted as accurately as possible. Results of the monitoring survey are presented below:

Monitoring Result for Contract 2

Mammal

7.4.2 There was no mammal recorded in the monitoring area

Birds

7.4.3 There were a total of 16 bird individuals from 7 species recorded in the monitoring area. No Golden-headed Cisticola was observed during the bird survey. Three species of conservation interests were recorded in this survey: Chinese Pond Heron (*Ardeola bacchus*) 池鷺, Black Kite (*Milvus migrans*) 黑鳶 and Greater Coucal (*Centropus sinensis*) 褐翅鴉鵂.

Herpetofauna

7.4.4 There was no reptile recorded in the monitoring area. There were 2 amphibian recorded in the monitoring area.

Butterfly

7.4.5 There was a total of 1 butterfly individual from 1 species recorded in the monitoring area.

Dragonfly

7.4.6 There were a total of 2 odonate from 1 species recorded in the monitoring area.

Aquatic Fauna Survey (Freshwater communities)

7.4.7 There were 2 species of freshwater fish were recorded in the monitoring area.

7.4.8 The summaries of faunal survey result are shown in **Tables 7-6** and **7-7**.

Table 7-6 Result of Faunal Survey under Contract 2

Scientific Name	Common / Engineer Name	Chinese Name	Conservation Status	Non-wetland		Wetland		
				UG	WL	MA	WW	WC
Mammal Survey								
--	--	--	--	--	--	--	--	--
Avifauna Survey								
<i>Ardeola bacchus</i>	Chinese Pond Heron	池鷺	Fellowes et al. (2002): PRC,(RC)			1		
<i>Milvus migrans</i>	Black Kite	黑鳶	Fellowes et al. (2002): (RC); Appendix 2 of CITES	1				
<i>Centropus sinensis</i>	Greater Coucal	褐翅鴉鵂	Class 2 Protected Animal of China;China Red Data Book Status: (Vulnerable)	1				
<i>Urocissa erythroryncha</i>	Red-billed Blue Magpie	紅嘴藍鵲			2			
<i>Pycnonotus jocosus</i>	Red-whiskered Bulbul	紅耳鶇			4			
<i>Prinia flaviventris</i>	Yellow-bellied Prinia	黃腹鷦鶯		2				
<i>Garrulax perspicillatus</i>	Masked Laughingthrush	黑臉噪鶇		5				
Reptile Survey								
--	--	--	--	--	--	--	--	--
Amphibian Survey								
<i>Fejervarya limnocharis</i>	Paddy Frog	澤蛙				+		
<i>Polypedates megacephalus</i>	Brown Tree Frog	斑腿泛樹蛙				+		
Butterfly Survey								
<i>Papilio helenus</i>	Red Helen	玉斑鳳蝶			1			
Odonate Survey								
<i>Copera marginipes</i>	Yellow Featherlegs	黃狹扇蟌				2		

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse

Table 7-7 Result of Freshwater Communities Survey under Contract 2

Scientific Name	Common Name	Chinese Name	Conservation Status	Non-wetland		Wetland		
				UG	WL	MA	WW	WC
<i>Gambusia affinis</i>	Mosquito fish	食蚊魚						+
<i>Puntius semifasciolatus</i>	Chinese Barb	五線無鬚魮						+

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse

+: Species appeared but uncountable.

Discussion

7.4.9 After analysing survey results in June 2019 to 2022, there was a decrease in species richness and abundance for wetland and non-wetland habitats. Still, a good site practice during construction, with reference to EM&A Manual, is still required to prevent or alleviate environmental impacts. For

instance, the size of work areas should be minimized and disturbed areas should be reinstated immediately after completion of construction works. Unnecessary site clearance should be avoided as well. In addition, implementing proper waste disposal is necessary to reduce contamination to water and soil. Continuous monitoring is also recommended to inspect any significant decrease in species diversity.

7.4.10 The detailed Ecological Survey Reports for Contract 1 and Contract 2 are attached in *Appendix K*.

7.4.11 The tentative ecology inspection and monitoring in the next Reporting Month (July 2022) is scheduled on *12th July 2022*.

7.5 MONITORING OF FLORA SPECIES OF CONSERVATION INTEREST UNDER CONTRACT 1

7.5.1 According to the approved vegetation survey report and transplantation proposal under FEP-01/534/2017/A, an individual of flora species of conservation interest (the transplanted T-2928) was identified and transplanted to the receptor site.

7.5.2 According to approved vegetation survey report and transplantation proposal, post-transplantation monitoring was conducted once per week in the first three months after the transplantation in Oct 2018 and once in each of the following month in the remaining establishment period for 12 month. During the remaining construction phase of the project, the transplanted T-2928 would be monitored on quarterly basis.

7.5.3 A landscape sub-contractor was employed by the Contractor to monitor the health condition of transplanted species and provide advice on necessary weeding, fertilizing and pest control. The monitoring records were submitted to ET and IEC for review and record. Moreover, inspection of the transplanted T-2928 was undertaken by ET as part of the weekly site inspection. No construction activity and disturbance were observed at the location of the transplanted T-2928. The health condition of the transplanted T-2928 was fair with normal foliage color and density.

7.6 MEASURE FOR PROTECTION OF NESTING BIRD

7.6.1 Pursuant to FEP-01/534/2017/A condition 2.19 and EP-534/2017/A condition 2.20, precautionary checks for the presence of nesting birds shall be carried out in the breeding season (February to July) before vegetation clearance.

7.6.2 As advised by both Contractors, there were no vegetation clearance conducted within the site in the Reporting Month and therefore precautionary check for the presence of nesting birds was not required.

8. LANDSCAPE AND VISUAL

8.1 REQUIREMENT

- 8.1.1 The EIA has recommended EM&A for landscape and visual resources to be undertaken during the design, construction and operational stages of the project. The design, implementation and maintenance of landscape mitigation measures is a key aspect of this and should be checked to ensure that they are fully realized and that potential conflicts between the proposed landscape measures and any other project works let its are resolved at the earliest possible date and without compromise to the intention of the mitigation measures. In addition, implementation of the mitigation measures recommended by the EIA will be monitored through the site audit programme.
- 8.1.2 A number of mitigation measures to ameliorate the landscape and visual impacts of the Project implementation is summarized in the EMIS of *Appendix 13.1* of the EIA Report.
- 8.1.3 The landscape and visual mitigation measures proposed should be incorporated in the landscape and engineering design. Mitigation measures to be implemented during construction should be adopted from the start of construction and be in place throughout the entire construction period. Mitigation measures to be implemented during operation should be integrated into the detailed design and built as part of the construction works so that they are in place on commissioning of the Project. Tree transplantation and compensatory planting should be carried out as early as possible in the Project with transplantation carried out prior to construction starting in any particular area.
- 8.1.4 During construction phase, Landscape & Visual Monitoring of the contractor’s operations should be conducted monthly and reported by ET, and countersigned by IEC.

8.2 FINDINGS / DEFICIENCIES DURING SITE INSPECTION IN THE REPORTING MONTH

- 8.2.1 In the Reporting Month, landscape & visual inspection was carried out by the Registered Landscape Architect (RLA) for works area of Contract 1 and Contract 2 on *28th June 2022*. The findings / reminders recorded during the inspection are presented in *Tables 8-1 and 8-2*.

Table 8-1 Landscape & Visual Inspection Finding for Contract 1

Date	Findings and Reminder	Follow-Up Status
28 th June 2022	1. The Contractor is reminded to set up TPZ of proper size and with appropriate material around retain trees according to approved method statement.	• Reminder only
	2. The Contractor is reminded to prevent the construction material pile within TPZ and ensure no works is allowed within the TPZ.	• Reminder only
	3. Transplanted tree T2465 was in fair health condition with normal foliage color and density, while sparse foliage and small foliage size were observed on transplanted trees T2468 and T2928, health condition was concerned, re-monitoring of the tree condition is recommended. Contractor is reminded to provide proper maintenance according to approved method statement.	• Contractor will provide proper maintenance according to approved method statement for transplanted trees T2468 and T2928

Table 8-2 Landscape & Visual Inspection Finding for Contract 2

Date	Findings and Reminder	Follow-Up Status
28 th June 2022	1. Contractor is reminded to set up TPZ of proper size and with appropriate material around retain trees according to approved method statement. Contractor should prevent any construction material pile within TPZ and ensure no works is allowed within the TPZ.	• Reminder only

- 8.2.2 Inspection checklist of Landscape & Visual signed by RLA is attached in *Appendix L*.

9. WASTE MANAGEMENT

9.1 GENERAL WASTE MANAGEMENT

9.1.1 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time in accordance with the Waste Management Plan (WMP).

9.2 RECORDS OF WASTE QUANTITIES

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

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

9.2.2 The quantities of waste for disposal in this Reporting Month are summarized in [Table 9-1](#) and [9-2](#) and the Monthly Summary Waste Flow Table is shown in [Appendix M](#). Whenever possible, materials were reused on-site as far as practicable.

Table 9-1 Summary of Quantities of Inert C&D Materials

Type of Waste	Contract 1		Contract 2	
	Quantity	Disposal Location	Quantity	Disposal Location
Total generated C&D Materials (Inert) ('000m ³)	0.200	--	562.68 (#)	--
Reused in this Contract (Inert) ('000m ³)	0.100	--	0	--
Reused in other Projects (Inert) ('000m ³)	0	--	0	--
Disposal as Public Fill (Inert) ('000m ³)	0.100	Tuen Mun Area 38	562.68 (#)	Tuen Mun Area 38

Remark: the unit is '000kg

Table 9-2 Summary of Quantities of C&D Wastes

Type of Waste	Contract 1		Contract 2	
	Quantity	Disposal Location	Quantity	Disposal Location
Recycled Metal ('000kg)	0	--	0	--
Recycled Paper / Cardboard Packing ('000kg)	0	--	0	--
Recycled Plastic ('000kg)	0	--	0	--
Chemical Wastes ('000kg)	0	--	0	--
General Refuses ('000m ³)	0.003	NENT Landfill	6.570 (#)	NENT Landfill

Remark: the unit is '000kg

9.2.3 Since canteen and/or kitchen are not allowed setting on the Project site, no domestic wastewater was generated from the Project.

10. SITE INSPECTION

10.1 REQUIREMENT

10.1.1 According to the approved EM&A Manual, environmental site inspection should be led by RE and attended by the Contractor and ET at least once per week. Regular environmental site inspections shall be carried out to assess the environmental performance.

10.2 FINDINGS / DEFICIENCIES DURING SITE INSPECTION IN THE REPORTING MONTH

Contract 1

10.2.1 In the Reporting Month, joint site inspections for Contract 1 to evaluate the site environmental performance were carried out by the RE, ET and the Contractor on **1st, 9th, 16th, 21st and 30th June 2022** and IEC attended joint site inspection on **16th June 2022**. No non-compliance was noted in the Reporting Month. The findings / deficiencies that observed during the weekly site inspection are listed in **Table 10-1**.

Table 10-1 Site Observations for the Works of Contract 1

Date	Findings / Deficiencies	Follow-Up Status
1 st June 2022	• No adverse environmental issue was observed.	• N/A
9 th June 2022	• The Contractor was advised to dispose the construction waste on site.	• Construction waste was removed on site.
	• The Contractor was reminded to check whether the generator require to have NRMM label.	• Reminder only.
16 th June 2022	• The Contractor was advised to provide drip tray or remove chemical container at CS13.	• Chemical container was removed.
	• The Contractor was advised to remove accumulated water inside drip tray of generator.	• Accumulated water inside drip tray was removed.
	• The Contractor was advised implement proper water mitigation measure to prevent muddy water at CS14.	• Road was filled with soil to avoid polluted runoff overflow.
	• The Contractor was reminded to maintain good housekeeping.	• Reminder only.
21 st June 2022	• The Contractor was reminded to spray water regularly at expose work area.	• Reminder only.
30 th June 2022	• The Contractor was reminded dispose empty chemical containers and construction waste regularly.	• Reminder only.

Contract 2

10.2.2 In the Reporting Month, joint site inspections for Contract 2 to evaluate the site environmental performance carried out by the RE, ET and the Contractor was on **1st, 9th, 16th, 21st and 30th June 2022** and IEC attended joint site inspection on **16th June 2022**. No non-compliance was noted in the Reporting Month. The findings / deficiencies that observed during the weekly site inspection are listed in **Table 10-2**.

Table 10-2 Site Observations for the Works of Contract 2

Date	Findings / Deficiencies	Follow-Up Status
1 st June 2022	• No adverse environmental issue was observed.	• N/A
9 th June 2022	• No adverse environmental issue was observed.	• N/A
16 th June 2022	• The Contractor was advised to remove empty chemical container and maintain good housekeeping at jacking peak.	• Empty chemical containers were removed on site.
21 st June 2022	• The Contractor was reminded to display NRMM label for excavator properly.	• Reminder only.
30 th June 2022	• No adverse environmental issue was observed.	• N/A

11. ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

11.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

11.1.1 In the Reporting Month, no environmental complaint was received for the project. No summons and prosecution was lodged for the Contract. The statistical summary table of the environmental complaint, summons and prosecution are presented in *Tables 11-1, 11-2* and *11-3*. The complaint log for the Project is shown in *Appendix N*.

Table 11-1 Statistical Summary of Environmental Complaints

Reporting Month		Environmental Complaint Statistics		
		Frequency	Cumulative	Complaint Nature
1 st – 30 th June 2022	Contract 1	0	2	(1) Air Quality (1) Noise
1 st – 30 th June 2022	Contract 2	0	3	(1) Water (1) Air Quality (1) Noise

Table 11-2 Statistical Summary of Environmental Summons

Reporting Month		Environmental Summons Statistics		
		Frequency	Cumulative	Complaint Nature
1 st – 30 th June 2022	Contract 1	0	0	NA
1 st – 30 th June 2022	Contract 2	0	0	NA

Table 11-3 Statistical Summary of Environmental Prosecution

Reporting Month		Environmental Prosecution Statistics		
		Frequency	Cumulative	Complaint Nature
1 st – 30 th June 2022	Contract 1	0	0	NA
1 st – 30 th June 2022	Contract 2	0	0	NA

11.1.2 In addition, no complaints received and emergency event relating to violation of environmental legislation for illegal dumping and landfilling were received.

12. IMPLEMENTATION STATUS OF MITIGATION MEASURES

12.1 GENERAL REQUIREMENTS

- 12.1.1 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (ISEMM) in the approved EM&A Manual covered the issues of dust, noise, water and waste.
- 12.1.2 The Works of Contract 1 and Contract 2 under the Project shall be implementing the required environmental mitigation measures according to the approved EM&A Manual subject to the site condition. Environmental mitigation measures implemented in this Reporting Month is summarized in **Table 12-1**. The status of the Environmental mitigation measures are presented in [Appendix O](#).

Table 12-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	<ul style="list-style-type: none"> • Provided efficient silt removal facilities to reduce SS level before effluent discharge. • Provided ditches, earth bunds or sand bag barriers to minimize polluted runoff. • Temporary drainage was provided to prevent runoff going through site surface and minimize polluted runoff. • Provided perimeter cut-off drains at site boundaries to intercept storm runoff from crossing the site. • Exposed slopes surface were compacted and covered with tarpaulin or similar means. • Provided portable chemical toilets on site.
Air Quality	<ul style="list-style-type: none"> • Maintain damp / wet surface on access road. • Maintain low vehicular speed within the works areas. • Provided vehicle wheel washing facilities at each construction site exit; • Provided water spraying every hour for all active works area. • Stockpiles of dusty material were covered with impervious sheeting. • Provided workers to clear dusty materials at the vehicle entrance or exit regularly. • Stockpile more than 20 bags of cement or dry pulverized fuel ash (PFA) has been covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides.
Noise	<ul style="list-style-type: none"> • Restricted operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday. • Keep good maintenance of plants. • Placed noisy plants away from residence and school. • Provided noise barriers or hoarding to enclose the noisy plants or works. • Shut down the plants when not in used.
Waste and Chemical Management	<ul style="list-style-type: none"> • Provided on-site sorting prior to disposal. • Followed requirements and procedures of the “Trip-ticket System” • Predicted required quantity of concrete accurately. • Collected the unused fresh concrete at designated locations in the sites for subsequent disposal.
Ecology	<ul style="list-style-type: none"> • Implementing water control measures (ETWB TCW No. 5/2005) to avoid direct or indirect impacts any watercourses and impact to any aquatic fauna during the construction phase. • Demarcation fencing has been erected to prevent unauthorised encroachment into the riparian corridor by constructions works and traffic. • The construction work and site formation have been phased in order to reduce overall noise disturbance impacts in particular areas. • Works have been restricted to daytime and any construction lighting was designed and positioned as to not impact on adjacent ecologically sensitive areas.
General	<ul style="list-style-type: none"> • The site was generally kept tidy and clean. • Environmental Permit was displayed at site entrance.

12.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH

12.2.1 According to the information provided by HCTYJV, the forthcoming construction activities for Contract 1 are listed below:

- Concrete pavement at RCP
- Paving block installation works
- Drill holes for planting works and fill top soil at CS16,17,11.
- Compaction works at footpath
- Drainage works at CS13

12.2.2 According to the information provided by Sang Hing, the forthcoming construction activities for Contract 2 are listed below:

- Construction of Manhole, gullies, drainage pipe at Lin Ma Hang Road between CH0-50 Southbound & CH505-565 Northbound & CH890-960 Northbound.
- Pipe Jacking works for DN400 watermain in approx. CH0-300 at Man Kam To Road
- DN400 DI Watermain reinstatement works in approx. CH700-1040 at Man Kam To Road North Slow Lane
- Construction of road works at Sandy Ridge Road E, Road F, Road B
- Fanling Station Road Covered Walkway
- Lung Sum Avenue road surface modification works

12.3 KEY ISSUES FOR THE COMING MONTH

12.3.1 The construction activities are illustrated in [Appendix P](#). Key issues to be considered in the coming month for the works of Contract 1 and 2 shown in [Table 12-2](#) and [Table 12-3](#).

Table 12-2 Work Undertaken and Illustrations of Mitigation Measures for Contract 1

Description of Construction Activities	Used on PME	Environmental Mitigation Measures
Compact works at footpath on Sandy Ridge	<ul style="list-style-type: none"> • Excavator • Compaction roller 	<ul style="list-style-type: none"> • Provided efficient silt removal facilities to reduce SS level before effluent discharge. • Provided ditches, earth bunds or sand bag barriers to minimize polluted runoff. • Exposed slopes surface were compacted and covered with tarpaulin or similar means. • Maintain damp / wet surface on access road. • Maintain low vehicular speed within the works areas. • Provided vehicle wheel washing facilities at each construction site exit; • Provided water spraying for all active works area, in particular for the soil nail works. • Stockpiles of dusty material were covered with impervious sheeting. • Provided workers to clear dusty materials at the vehicle entrance or exit regularly. • Stockpile more than 20 bags of cement or dry PFA has been covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. • Restricted operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday. • Keep good maintenance of plants. • Placed noisy plants away from residence and school. • Provided noise barriers or hoarding to enclose the noisy plants or works. • Shut down the plants when not in used. • Provided on-site sorting prior to disposal. • Followed requirements and procedures of the “Trip-ticket
Drill holes for planting works and fill top soil at CS15, 16, 17	<ul style="list-style-type: none"> • Driller • Crane lorry 	
Directional sign footing construction works	<ul style="list-style-type: none"> • Excavator • Compaction roller 	
U-channel and planter wall construction works at Cut Slope CS13	<ul style="list-style-type: none"> • Excavator • Crane Lorry 	
Slope drain works at Cut Slope CS13	<ul style="list-style-type: none"> • Excavator 	
Road pavement and watermain laying works	<ul style="list-style-type: none"> • Excavator • Compaction roller • Crane Lorry 	
Compact works at footpath at Sha Ling Road near Man Kam To Road	<ul style="list-style-type: none"> • Excavator • Compaction roller 	

Description of Construction Activities	Used on PME	Environmental Mitigation Measures
Drainage and sewerage works at RCP at Sha Ling Road near Man Kam To Road	<ul style="list-style-type: none"> ● Dump truck ● Excavator ● Crane Lorry 	<ul style="list-style-type: none"> ● System” ● Predicted required quantity of concrete accurately. ● Collected the unused fresh concrete at designated locations in the sites for subsequent disposal. ● Implementing water control measures (ETWB TCW No. 5/2005) to avoid direct or indirect impacts any watercourses and impact to any aquatic fauna during the construction phase. ● Demarcation fencing has been erected to prevent unauthorised encroachment into the riparian corridor by constructions works and traffic. ● The construction work and site formation have been phased in order to reduce overall noise disturbance impacts in particular areas. ● Works have been restricted to daytime and any construction lighting was designed and positioned as to not impact on adjacent ecologically sensitive areas. ● The site was generally kept tidy and clean.

Table 12-3 Work Undertaken and Illustrations of Mitigation Measures for Contract 2

Construction Activities	Used on PME	Environmental Mitigation Measures
Construction of Manhole, gullies, drainage pipe at Lin Ma Hang Road	<ul style="list-style-type: none"> ● Dump truck ● Excavator 	<ul style="list-style-type: none"> ● Provided efficient silt removal facilities to reduce SS level before effluent discharge. ● Provided ditches, earth bunds or sand bag barriers to minimize polluted runoff. ● Exposed slopes surface were compacted and covered with tarpaulin or similar means.
Pipe Jacking works for DN400 watermain at Man Kam To Road	<ul style="list-style-type: none"> ● Pipe jacking drilling machine 	<ul style="list-style-type: none"> ● Maintain damp / wet surface on access road. ● Maintain low vehicular speed within the works areas. ● Provided vehicle wheel washing facilities at each construction site exit. ● Provided water spraying for all active works area, in particular for the soil nail works.
Construction of road works at Sandy Ridge Road	<ul style="list-style-type: none"> ● Excavator ● Roller ● Dump truck 	<ul style="list-style-type: none"> ● Stockpiles of dusty material were covered with impervious sheeting. ● Provided workers to clear dusty materials at the vehicle entrance or exit regularly. ● Stockpile more than 20 bags of cement or dry PFA has been covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. ● Restricted operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday. ● Keep good maintenance of plants. ● Placed noisy plants away from residence and school. ● Provided noise barriers or hoarding to enclose the noisy plants or works. ● Shut down the plants when not in used. ● Provided on-site sorting prior to disposal. ● Followed requirements and procedures of the “Trip-ticket System” ● Predicted required quantity of concrete accurately. ● Collected the unused fresh concrete at designated locations in the sites for subsequent disposal. ● Implementing water control measures (ETWB TCW No. 5/2005)

Construction Activities	Used on PME	Environmental Mitigation Measures
		to avoid direct or indirect impacts any watercourses and impact to any aquatic fauna during the construction phase. <ul style="list-style-type: none"> ● Demarcation fencing has been erected to prevent unauthorised encroachment into the riparian corridor by constructions works and traffic. ● The construction work and site formation have been phased in order to reduce overall noise disturbance impacts in particular areas. ● Works have been restricted to daytime and any construction lighting was designed and positioned as to not impact on adjacent ecologically sensitive areas. ● The site was generally kept tidy and clean.

12.3.1 The Contractors are reminded to pay special attention on water quality mitigation measures and should fully implement the measures as recommended in the EM&A Manual, in particular to prevent surface runoff and other pollutants from flowing to local stream and Conservation Area.

13. CONCLUSIONS AND RECOMMENTATIONS

13.1 CONCLUSIONS

- 13.1.1 This is the **47th** Monthly EM&A Report presenting the monitoring results and inspection findings for the period of **1st** to **30th June 2022**.
- 13.1.2 No 24-hour or 1-hour TSP monitoring result that triggered the Action or Limit Levels was recorded. No NOEs or the associated corrective action was therefore required.
- 13.1.3 In the Reporting Month, no noise complaint (which triggered Action Level) was received and no Limit Level exceedance for noise monitoring exceedance was recorded.
- 13.1.4 In the Reporting Month, **12** Limit level water quality exceedances, namely **6** exceedances of turbidity and **6** exceedances of SS were recorded. According to the weather information from the HKO, there was heavy rainstorm intermittently during the days of exceedance recorded. Under the impact of rainstorm, the water quality of the watercourse was deteriorated by the stirred up sediment and runoff from the surrounding environment. Weekly site inspection revealed that water quality mitigation measures were in place and the site conditions were generally in order. It was concluded that the exceedances were likely related to the impact of rainstorm and not caused by the work under the project.
- 13.1.5 Monthly ecological monitoring for sensitive habitat for area of Contract 1 and Contract 2 were undertaken on **14th June 2022**. After analysing survey results in June from 2019 to 2022, there was no significant drop in species richness and abundance for wetland habitat under Contract 1 and Contract 2. Yet, good site practice during construction, with reference to EM&A Manual, is required to prevent or alleviate environmental impacts. For instance, the size of work areas should be minimized and disturbed areas should be reinstated immediately after completion of construction works. Unnecessary site clearance should be avoided as well. In addition, implementing proper waste disposal is necessary to reduce contamination to water and soil. Continuous monitoring is also recommended to inspect any significant decrease in species diversity.
- 13.1.6 As advised by both Contractors, there were no vegetation clearance conducted within the site in the Reporting Month and therefore precautionary check for the presence of nesting birds was not required.
- 13.1.7 Landscape and visual inspection at both Contracts were undertaken on **28th June 2022**. The Contractor was reminded to prevent the construction material pile within Tree Protection Zone and ensure no works is allowed within the TPZ.
- 13.1.8 In the Reporting Month, no environmental complaints, summons and prosecution were received. In addition, no complaints received and emergency events relating to violation of environmental legislation for illegal dumping and landfilling were received.
- 13.1.9 In the Reporting Month, joint site inspections for Contract 1 to evaluate the site environmental performance were carried out by the Resident Engineer, ET and the Contractor of the Contract 1 on **1st, 9th, 16th, 21st and 30th June 2022**. Moreover, joint site inspections for Contract 2 by the RE, ET and the Contractor of Contract 2 were carried out on **1st, 9th, 16th, 21st and 30th June 2022**. IEC attended the both Contract joint site inspection on **21st June 2022**. No non-compliance was noted during the site inspections.

13.2 RECOMMENDATIONS

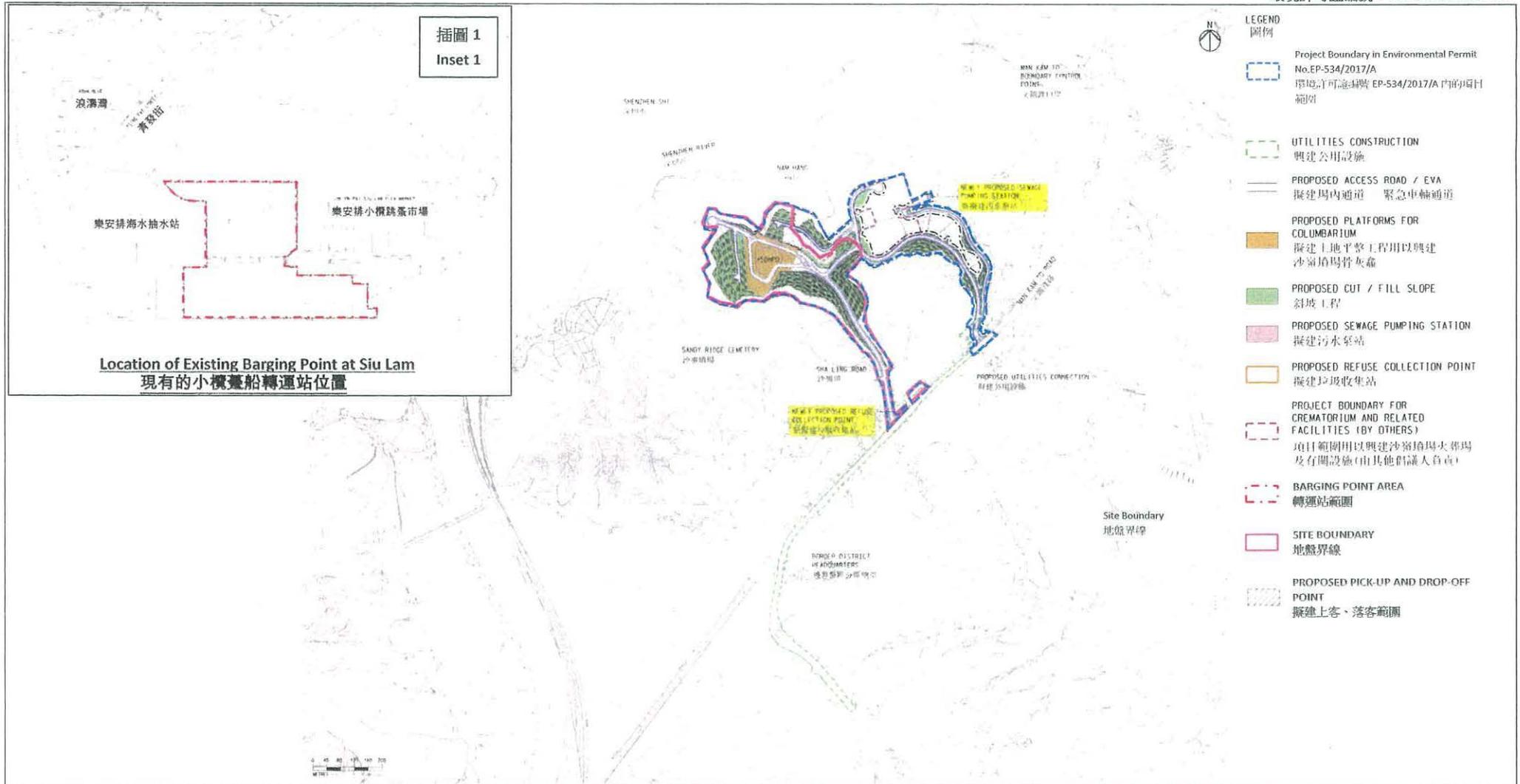
- 13.2.1 During wet season, the Contractors are reminded to pay special attention on water quality mitigation measures and should fully implement the measures as recommended in the EM&A Manual, in particular to prevent surface runoff and other pollutants from flowing to local stream and Conservation Area.

- 13.2.2 Air quality mitigation measures such as wheel wash facilities, watering of haul roads, loose soil construction surface and covering of dusty materials with tarpaulin sheet should be implemented as far as practicable.
- 13.2.3 Construction noise would be a key environmental issue during construction phase of the Project. Noise mitigation measures such as using quiet plants and mobile noise barriers should be implemented in accordance with the EM&A requirement.

Appendix A

Layout Plan of the Project

Layout Plan of Contract CV/2016/10



Project Title: Site Formation and Associated Infrastructural Works for Development of Columbarium at Sandy Ridge Cemetery
 工程名稱：沙嶺墳場興建骨灰龕的工地平整及相關基建工程

Figure 1: Project Location Plan

圖 1：項目位置圖

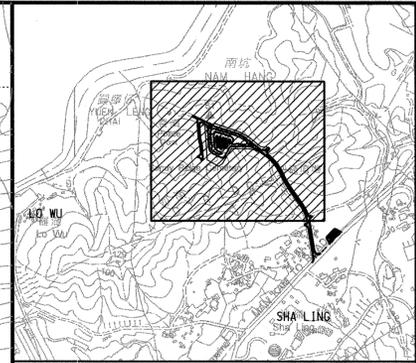
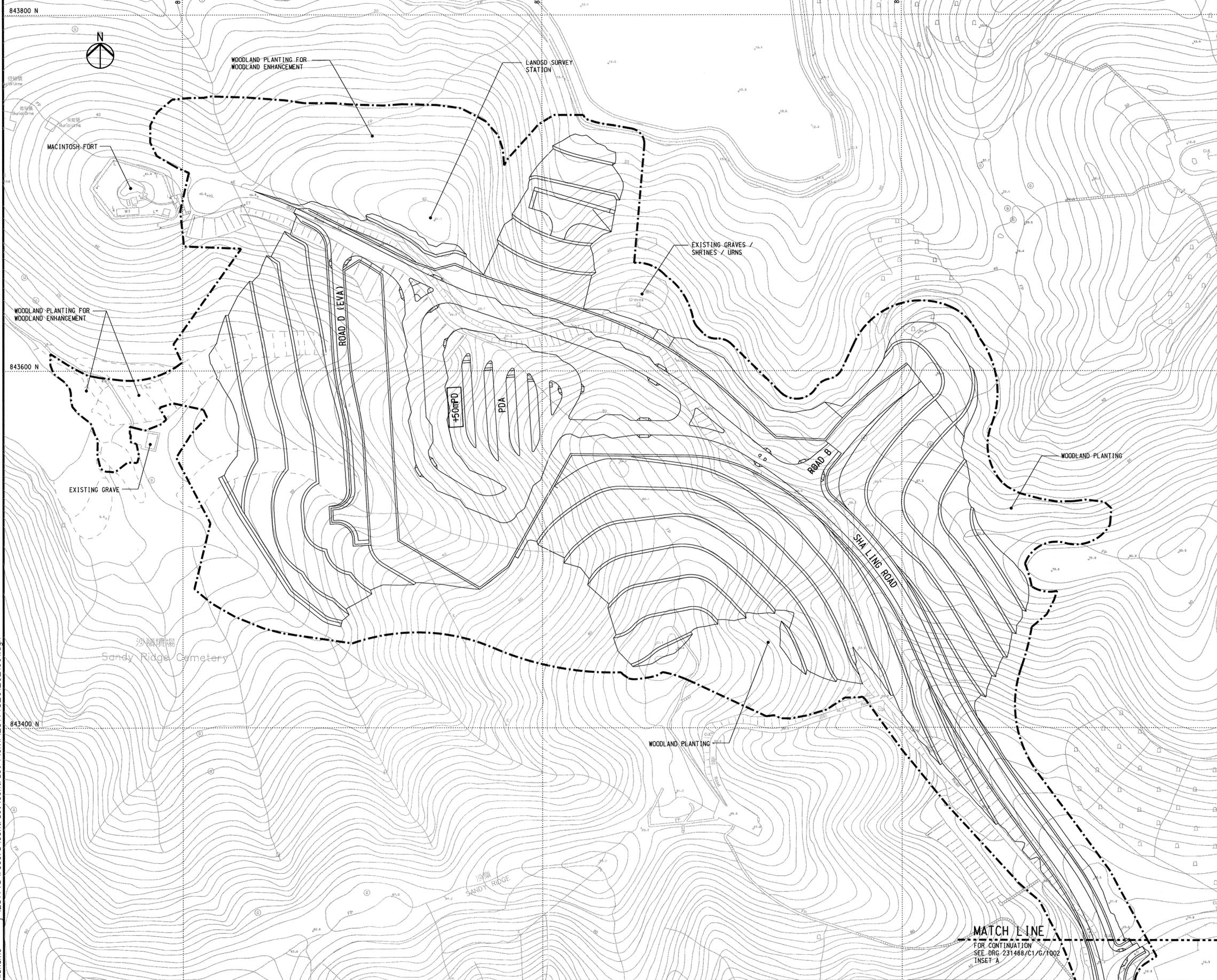
(This figure was prepared based on Figure 1 attached to the VEP Application No. VEP-555/2018 and Figures 1.3 of the Approved EIA Report No. AEIAR-198/2016)

(本圖是根據更改環境許可證申請文件編號：VEP-555/2018 所隨附的圖 1 和環境影響評估報告編號 AEIAR-198/2016 圖 1.3 編制)

Environmental Permit No.: FEP-01/534/2017/A
 環境許可證編號：FEP-01/534/2017/A



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 +50mPD SITE FORMATION LEVEL

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Consultant	ARUP		
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Contract No. and Title:
 Contract No. CV/2016/10
 Site Formation and Associated
 Infrastructural Works for
 Development of Columbarium at
 Sandy Ridge Cemetery

Drawing title
**GENERAL LAYOUT
 (SHEET 1 OF 3)**

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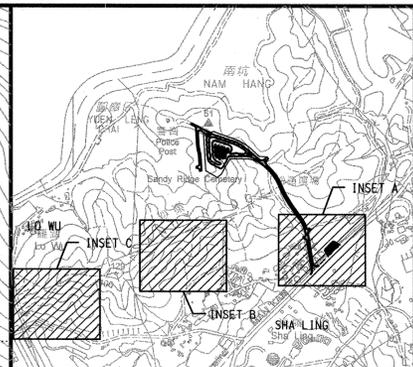
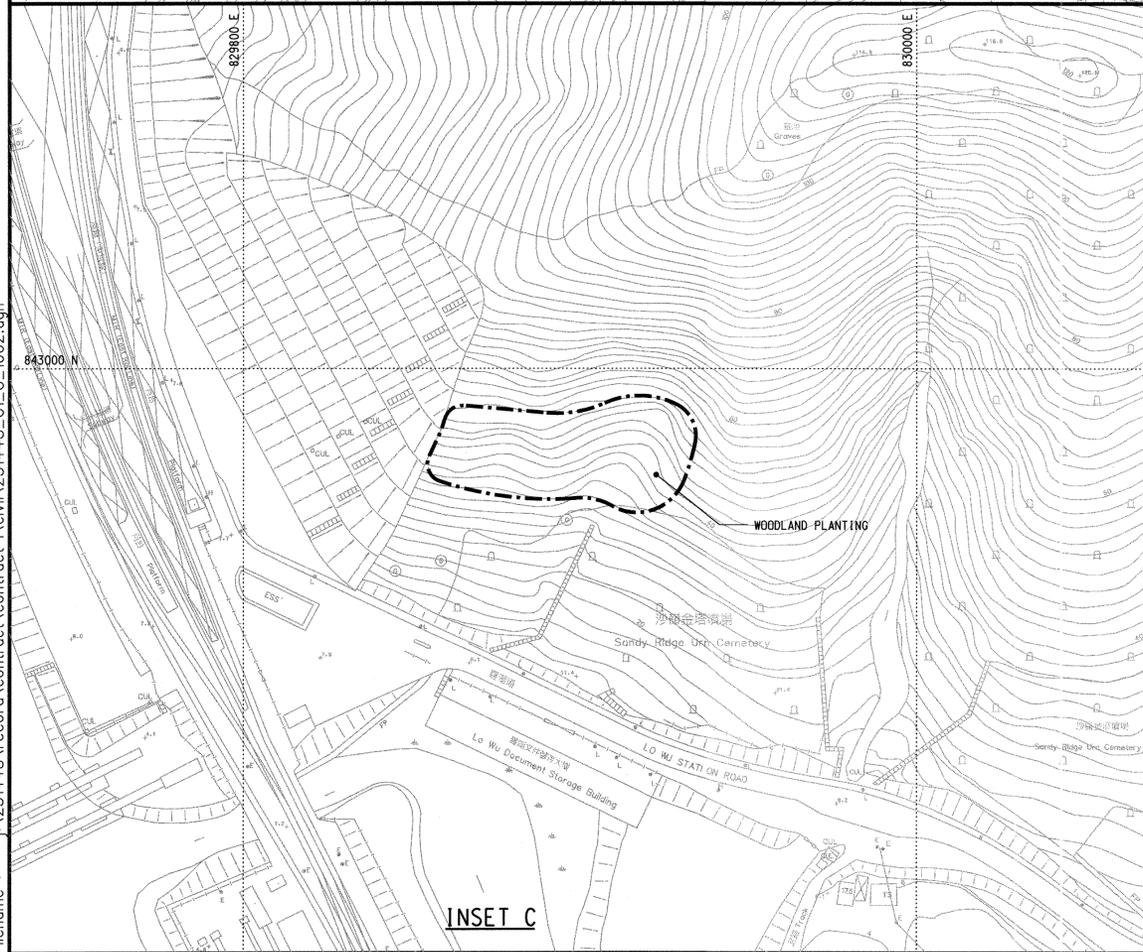
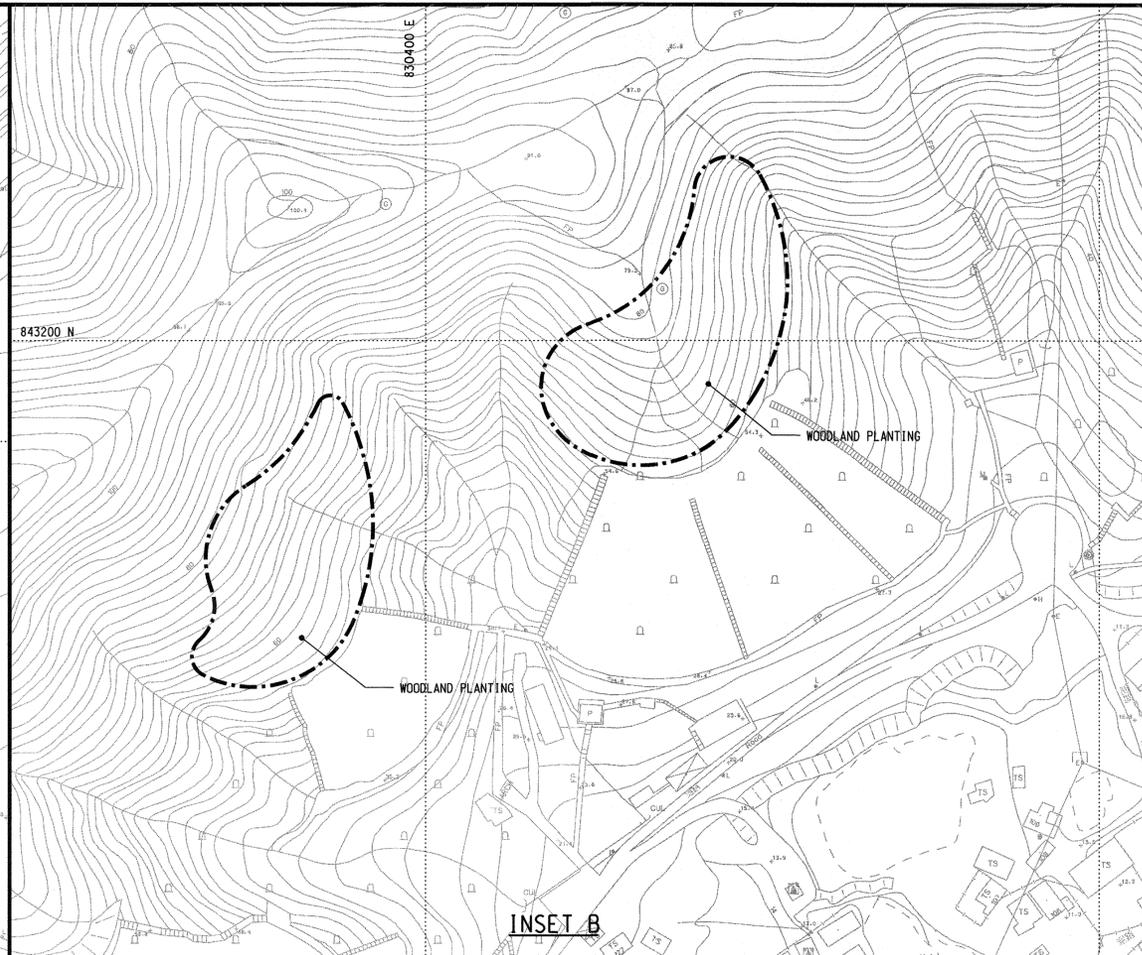
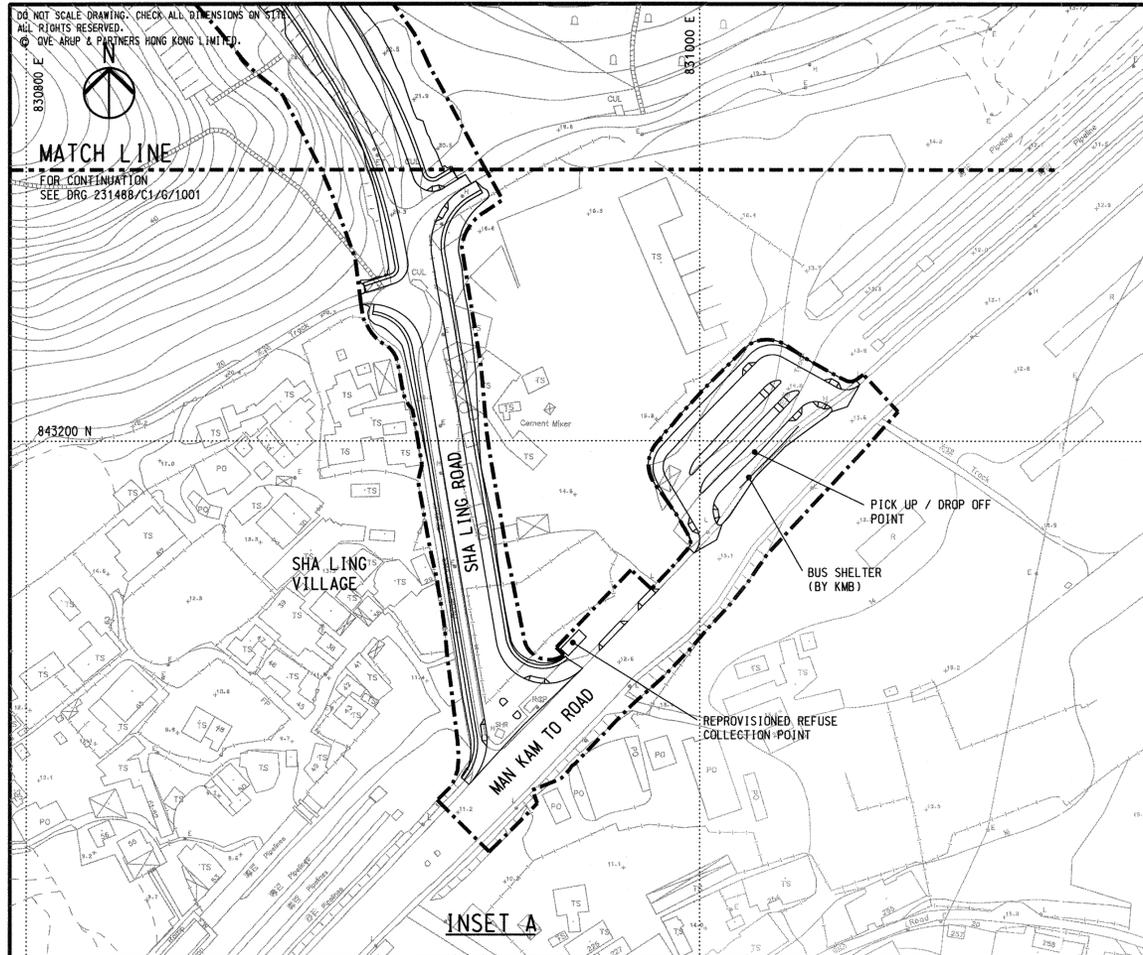
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--- PROPOSED WORKS SITE

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Site Formation and Associated
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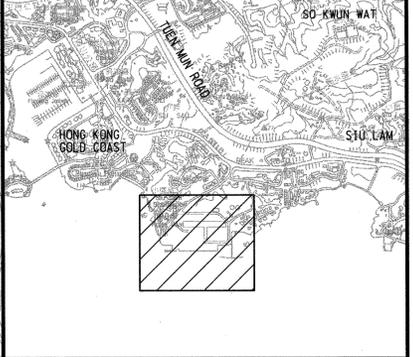
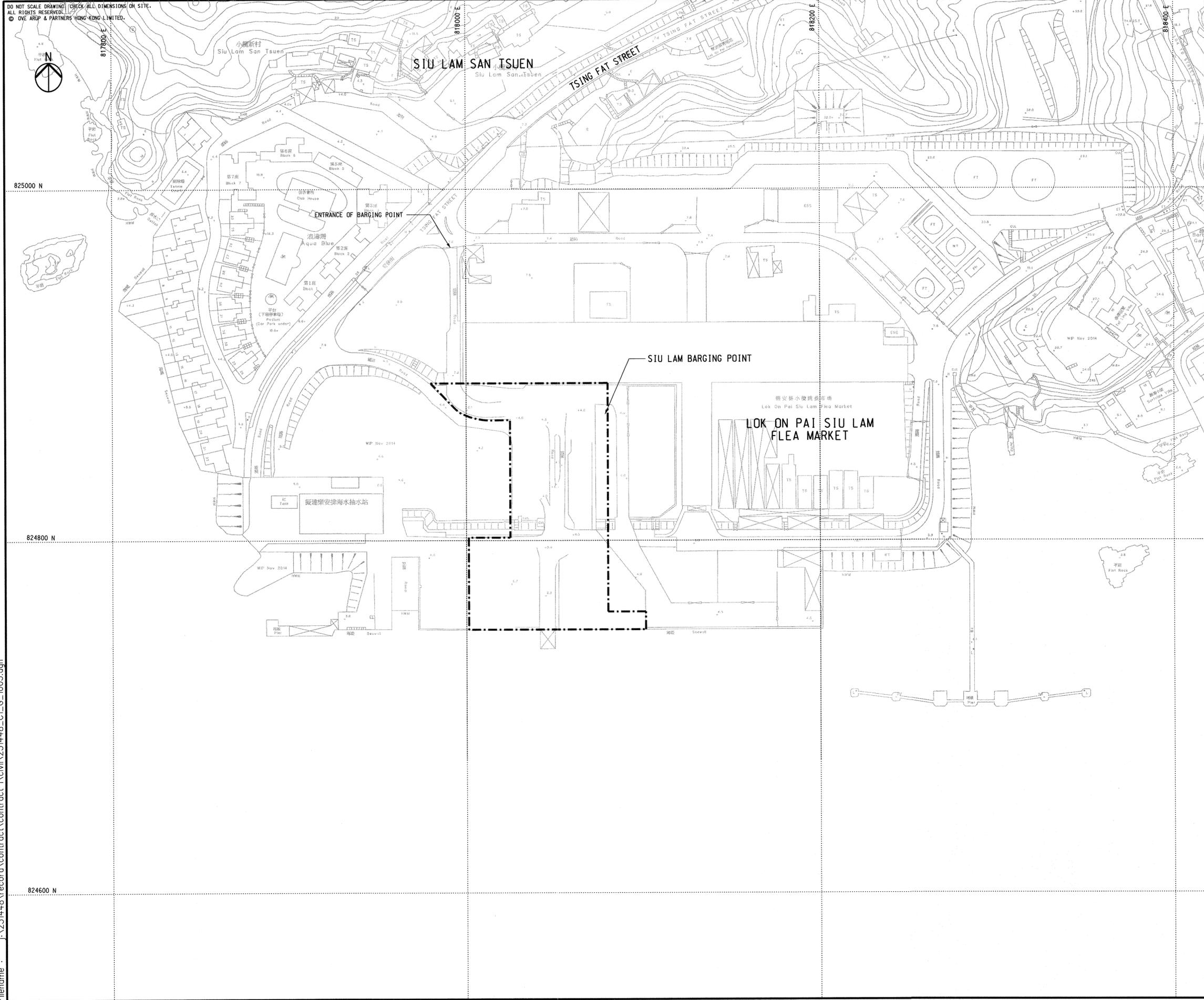
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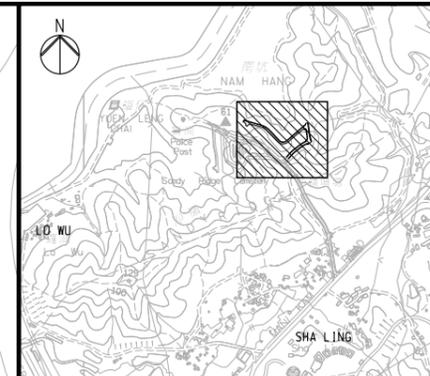
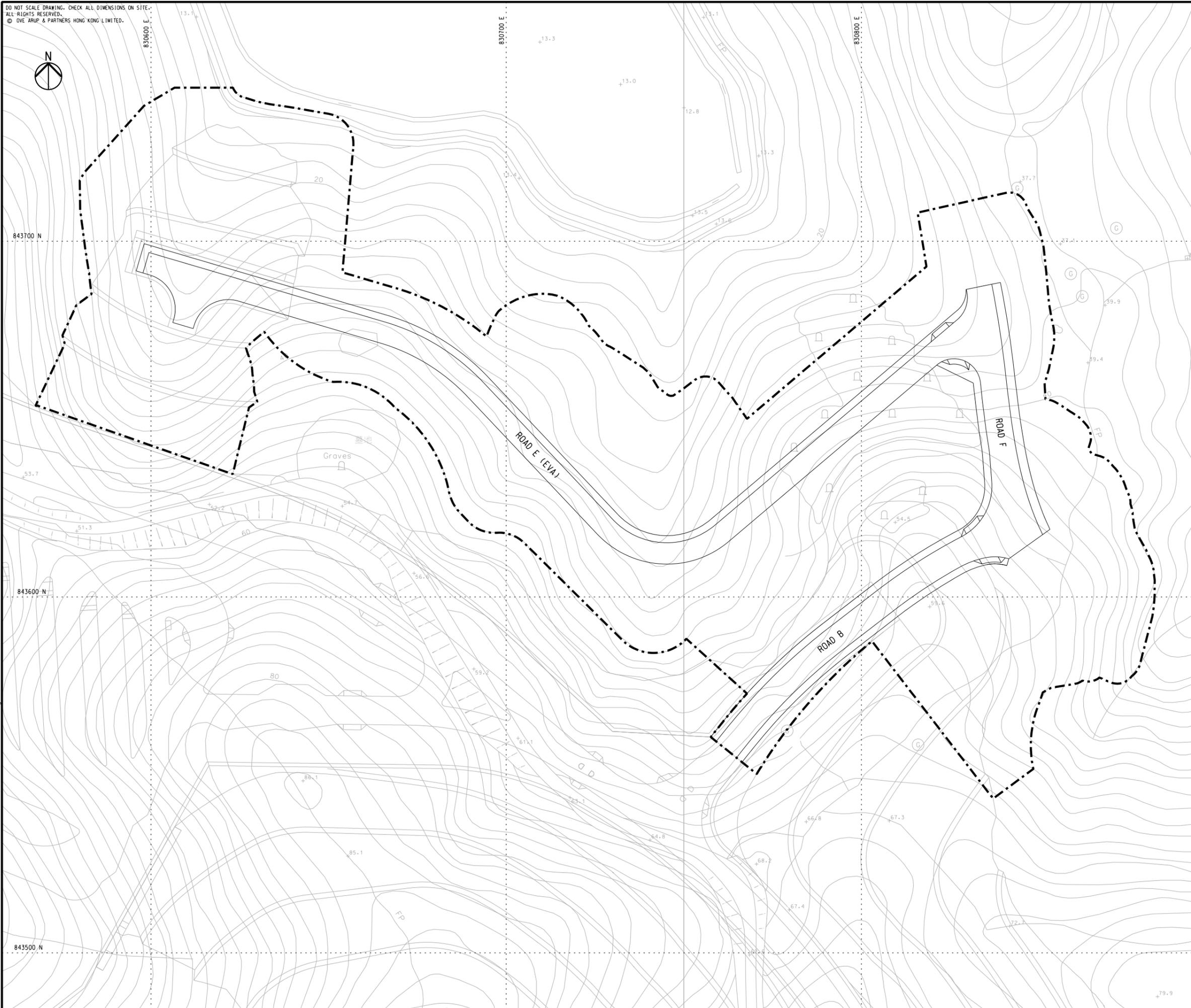


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Layout Plan of Contract CV/2017/02

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 Contract No. CV/2017/02
 Development of Columbarium
 at Sandy Ridge Cemetery -
 Infrastructural Works at
 Man Kam To Road and
 Lin Ma Hang Road

Drawing title
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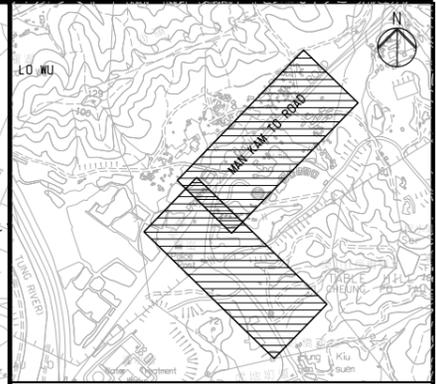
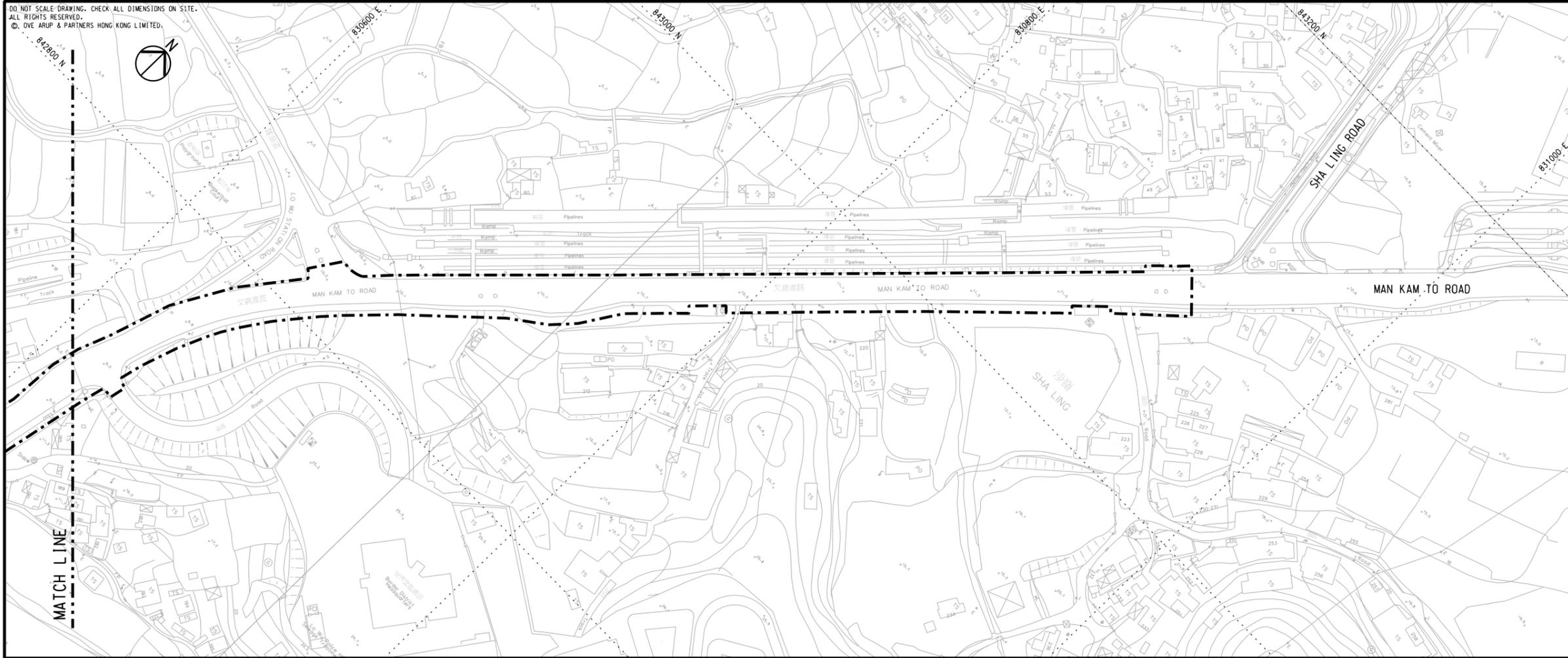
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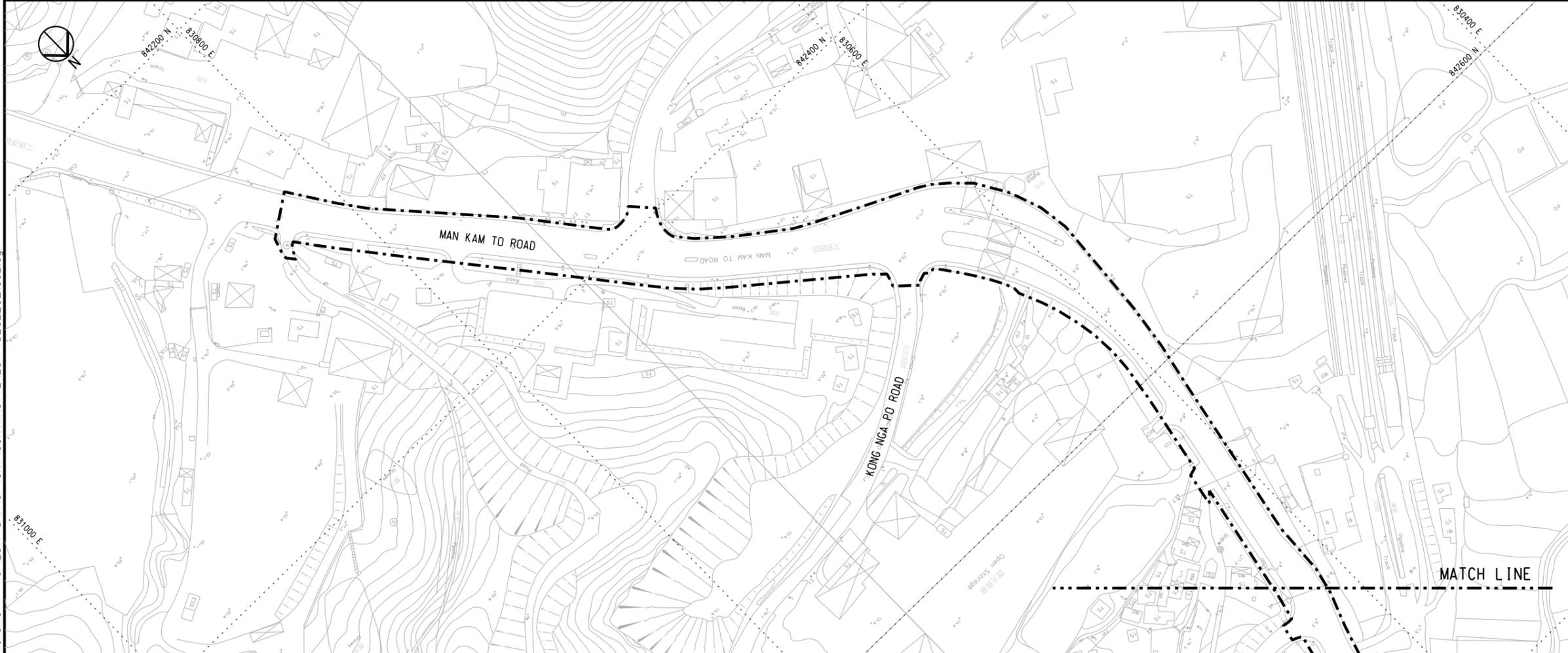
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Infrastructural Works at
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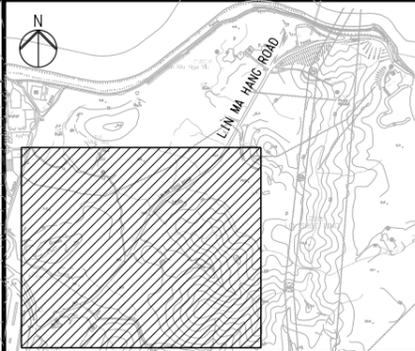
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 Infrastructural Works at
 Man Kam To Road and
 Lin Ma Hang Road

Drawing title
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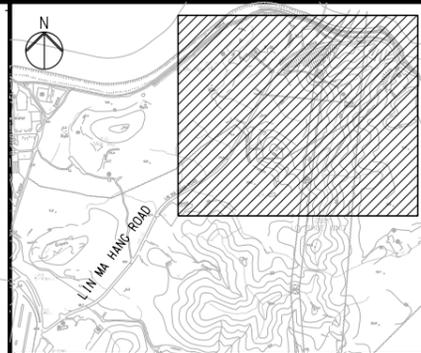
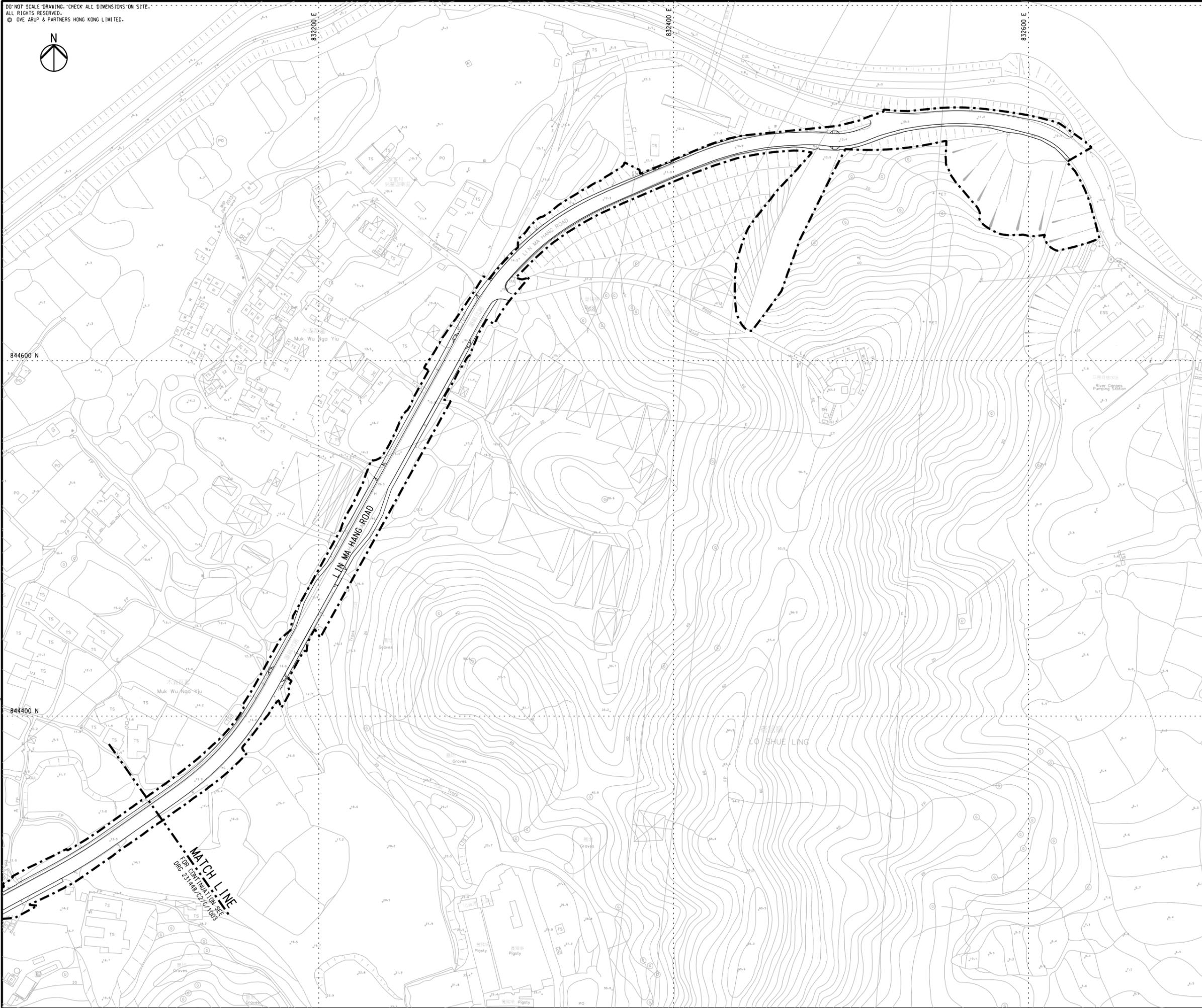
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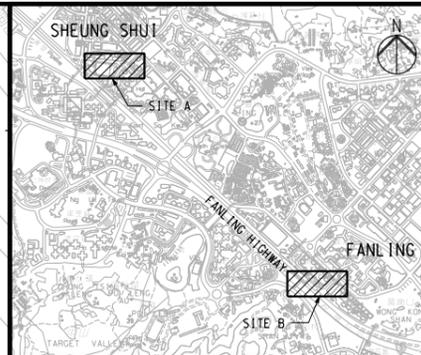
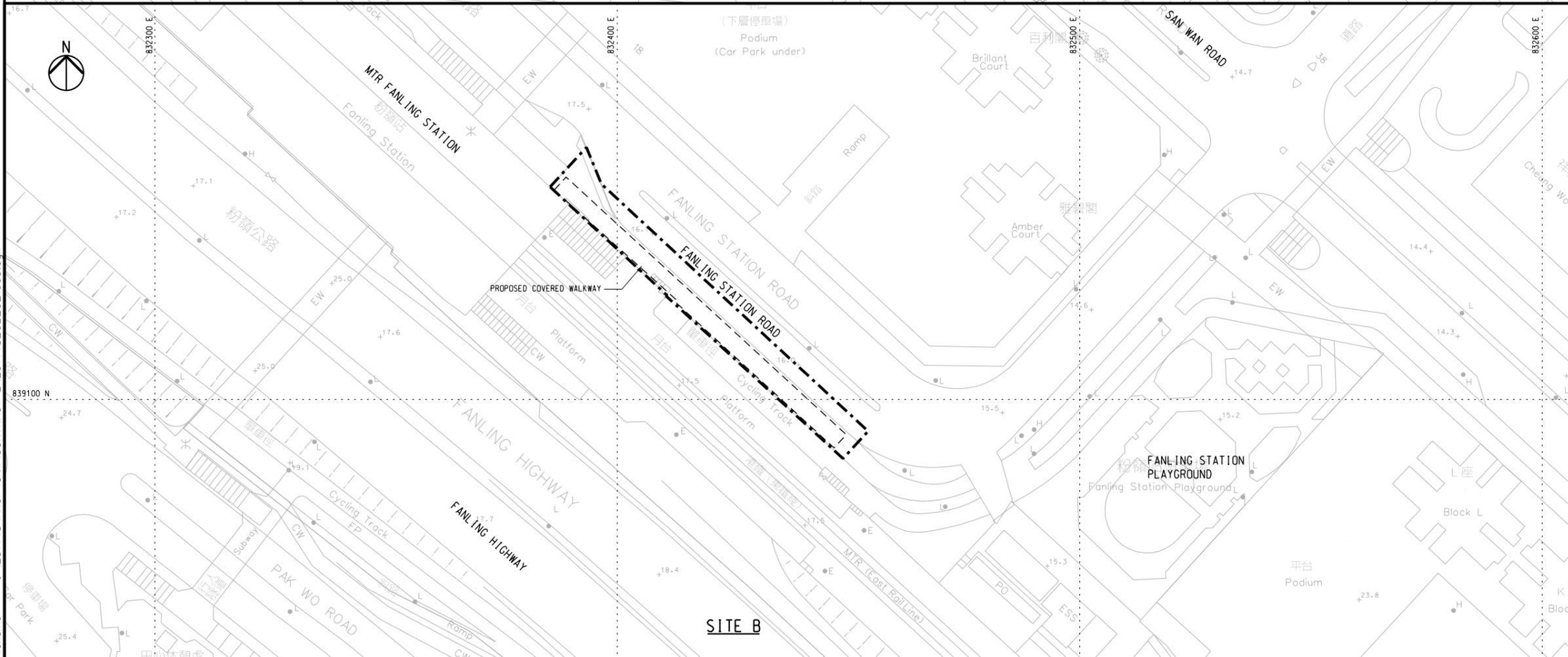
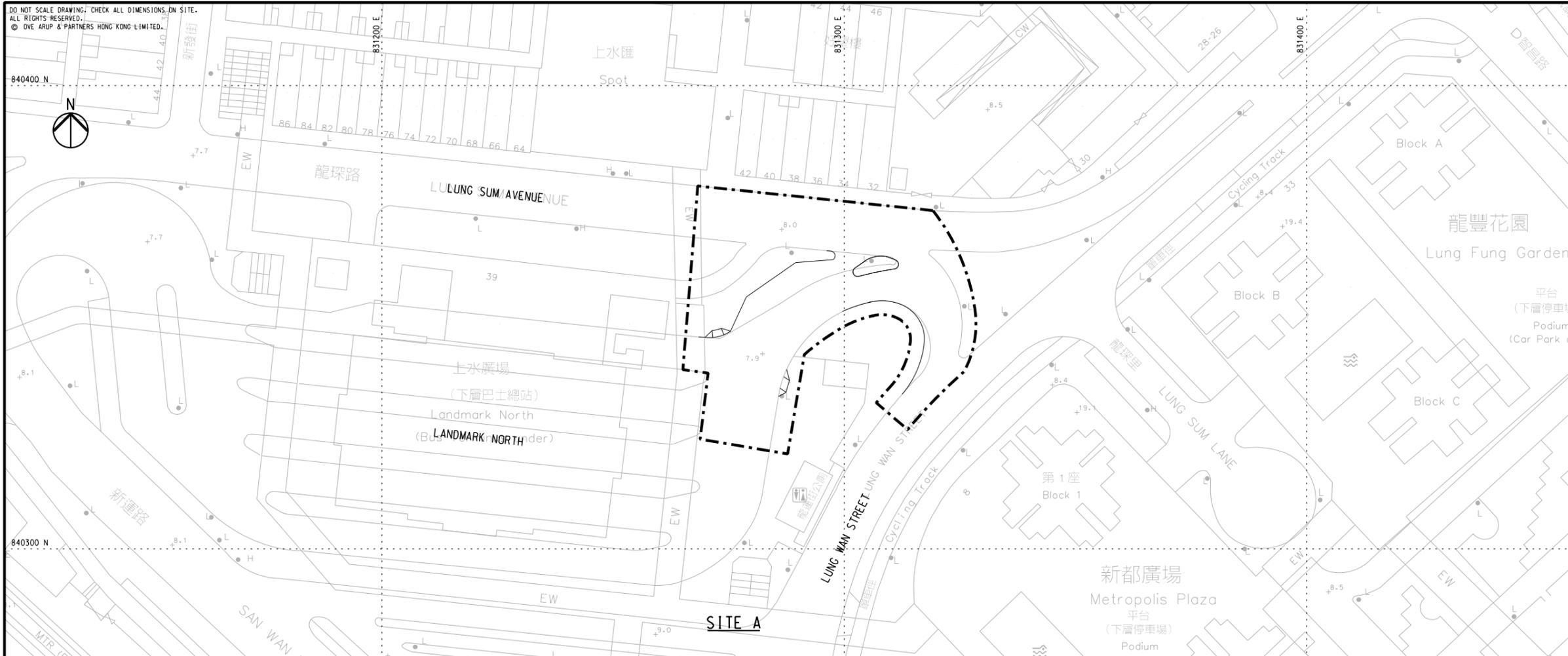


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KEY PLAN

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Consultant
ARUP

Contract No. and Title:
Contract No. CV/2017/02
Development of Columbarium
at Sandy Ridge Cemetery -
Infrastructural Works at
Man Kam To Road and
Lin Ma Hang Road

Drawing title
**GENERAL LAYOUT
(SHEET 5 OF 5)**

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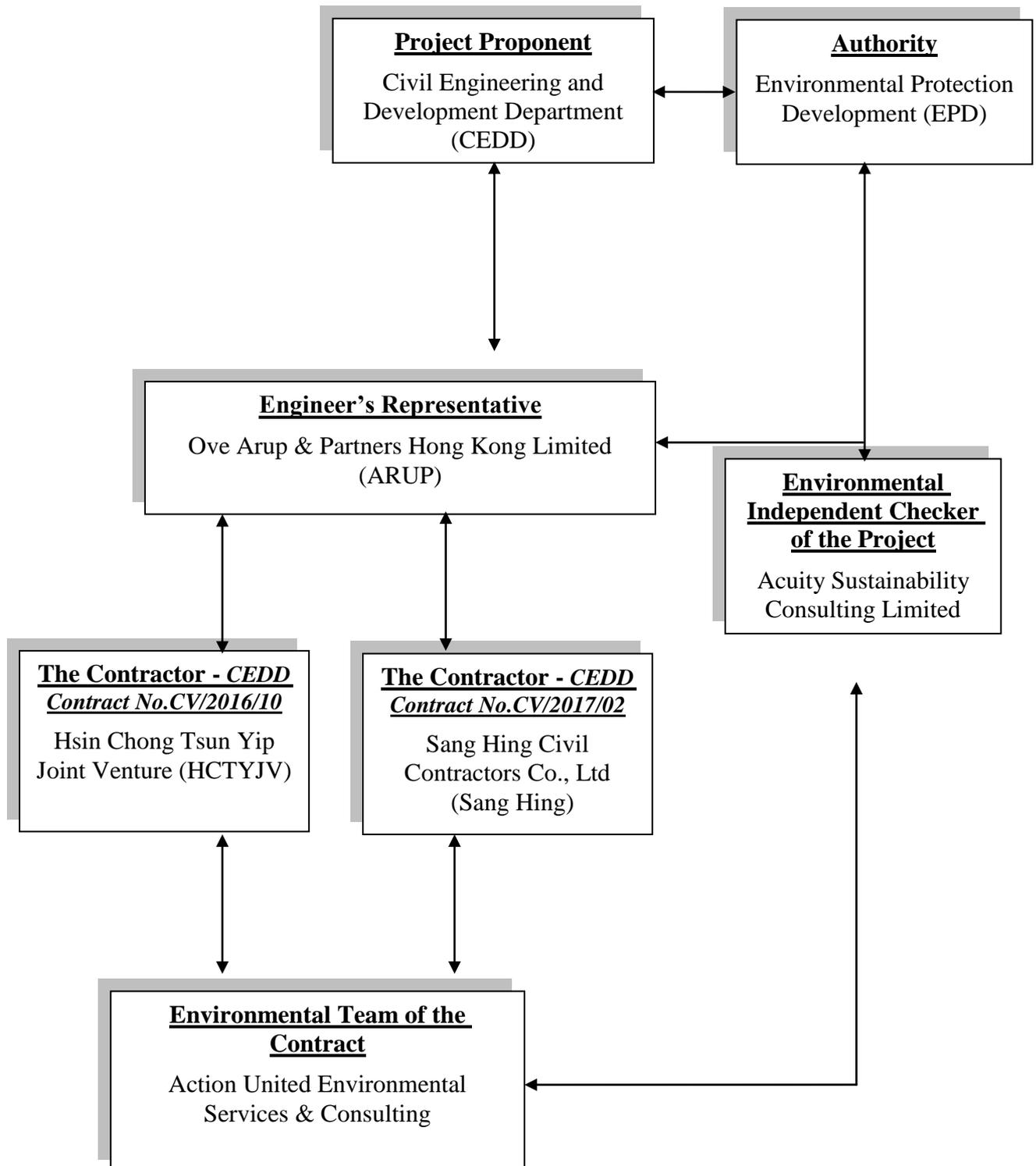
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Appendix B

Organization Structure and Contact Details of Relevant Parties

The Contract’s Environmental Management Organization



Contact Details of Key Personnel for CV/2016/10 (Contract 1)

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
CEDD	Employer	CHOI Wing-hing	2762-5620	2714-0695
ARUP	Engineer's Representative	Steve Tang	6190-1513	2268-3950
ACUITY	Independent Environmental Checker	Mr. Leung CH Jacky	2698-6833	2698-9383
HCTYJV	Project Director	Mr. Keniel Kwong	9495-2408	2633-4691
HCTYJV	Construction Manager	Mr. Ho Man To	9620-9794	2633-4691
HCTYJV	Environmental Officer	To be advised		
HCTYJV	Environmental supervisor	Mr. Leung Pak Sum	9437-3606	2633-4691
AUES	Environmental Team Leader	Mr. T.W. Tam	2959-6059	2959-6079
AUES	Environmental Consultant	Mr. Ben Tam	2959-6059	2959-6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959-6059	2959-6079
AUES	Environmental Site Inspector	Mr. Martin Li	2959-6059	2959-6079

Legend:

CEDD (Employer) – Civil Engineering and Development Department

ARUP (Engineer) – Ove Arup & Partners Hong Kong Limited

HCTYJV (Main Contractor) – Hsin Chong Tsun Yip Joint Venture

ACUITY (IEC) – Acuity Sustainability Consulting Limited

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

Contact Details of Key Personnel for CV/2017/02 (Contract 2)

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
CEDD	Employer	CHOI Wing-hing	2762-5620	2714-0695
ARUP	Engineer's Representative	Anthony Lau	6190-1513	2268-3950
ACUITY	Independent Environmental Checker	Ir. Leung CH Jacky	2698-6833	2698-9383
SANG HING	Project Director	Edwin Au	9208-7329	2403-1162
SANG HING	Construction Manager	Raymond Wong	9272-1831	2403-1162
SANG HING	Site Agent	Elvin Lam	6285-0803	2403-1162
SANG HING	Environmental Officer	Keibi Chan	6090-0183	2403-1162
SANG HING	Environmental Supervisor	Kenny Chan	6115-0120	2403-1162
AUES	Environmental Team Leader	Mr. T.W. Tam	2959-6059	2959-6079
AUES	Environmental Consultant	Mr. Ben Tam	2959-6059	2959-6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959-6059	2959-6079
AUES	Environmental Site Inspector	Mr. Martin Li	2959-6059	2959-6079

Legend:

CEDD (Employer) – Civil Engineering and Development Department

ARUP (Engineer) – Ove Arup & Partners Hong Kong Limited

Sang Hing (Main Contractor) – Sang Hing Civil Contractors Co., Ltd

ACUITY (IEC) – Acuity Sustainability Consulting Limited

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

Appendix C

Three Months Rolling Programme

**Three Months Rolling Programme of
Contract CV/2016/10**

3 Month Rolling Programme (June 2022 to Aug 2022)

ID	Task Name	Duration	Start	Finish	% Complete	Remaining Duration	5	6	7	8	9
1	Key Dates	1071 days	Fri 15/12/17	Fri 30/7/21	0%	1071 days					
2	Contract Starting Date	0 days	Fri 15/12/17	Fri 15/12/17	0%	0 days					
3	Contract Completion Date for Section 1	1 day	Sat 29/8/20	Sat 29/8/20	0%	1 day					
4	Contract Completion Date for Section 2	1 day	Fri 30/7/21	Fri 30/7/21	0%	1 day					
5	Contract Completion Date for Section 3	1 day	Thu 21/11/19	Thu 21/11/19	0%	1 day					
6	Scheduled Completion Date	644 days	Tue 10/12/19	Mon 14/2/22	0%	644 days					
7	Section 1	0 days	Sat 2/10/21	Sat 2/10/21	0%	0 days					
8	Section 2	0 days	Mon 14/2/22	Mon 14/2/22	0%	0 days					
9	Section 3	0 days	Tue 10/12/19	Tue 10/12/19	0%	0 days					
10	Preliminary Works	144 days	Tue 20/2/18	Wed 15/8/18	100%	0 days					
11	Submission and Approval Required at Environmental Permit for Commencement of Construction	128 days	Tue 20/3/18	Wed 15/8/18	100%	0 days					
12	Other Submission (Initial Survey /Tree Survey/ Condition Survey)	106 days	Tue 20/2/18	Fri 22/6/18	100%	0 days					
13	Section 1 of the Works (Parts A1, A2 & A3)	1041 days	Thu 29/3/18	Sat 2/10/21	70%	316.43 days					
14	Ground Investigation and Geotechnical Instrumentation for Commencement of Slopework	112 days	Thu 29/3/18	Wed 15/8/18	100%	0 days					
15	Verification Drillholes (8 Nos., VDH1, 2, 7-9,8-16) / Inspection Pits and Preliminary Results Submission	114 days	Thu 29/3/18	Wed 8/8/18	100%	0 days					
16	Design Review	36 days	Thu 5/7/18	Wed 15/8/18	100%	0 days					
17	Retaining Wall RW1	280 days	Thu 16/8/18	Sat 27/7/19	100%	0 days					
18	General Excavation to Formation Level	37 days	Thu 16/8/18	Thu 27/9/18	100%	0 days					
19	Plate Load Test and Blinding Layer for Retaining Wall Bays 1-4	3 days	Fri 28/9/18	Mon 1/10/18	100%	0 days					
20	Plate Load Test and Blinding Layer for Retaining Wall Bays 5-8	3 days	Tue 2/10/18	Thu 4/10/18	100%	0 days					
21	Plate Load Test and Blinding Layer for Retaining Wall Bays 9-13	15 days	Wed 10/10/18	Fri 26/10/18	100%	0 days					
22	Plate Load Test and Blinding Layer for Retaining Wall Bays 14-17	7 days	Sat 6/10/18	Sat 13/10/18	100%	0 days					
23	Base slab of Retaining Wall RW1 Bay 1-4	8 days	Tue 2/10/18	Wed 10/10/18	100%	0 days					
24	Base slab of Retaining Wall RW1 Bay 5-8	13 days	Mon 8/10/18	Mon 22/10/18	100%	0 days					
25	Base slab of Retaining Wall RW1 Bay 9-13	17 days	Mon 22/10/18	Fri 9/11/18	100%	0 days					
26	Base slab of Retaining Wall RW1 Bay 14-17	17 days	Mon 22/10/18	Fri 9/11/18	100%	0 days					
27	Wall Stem of Retaining Wall RW1 Bay1-4	36 days	Thu 25/10/18	Wed 5/12/18	100%	0 days					
28	Wall Stem of Retaining Wall RW1 Bay 5-8	26 days	Tue 11/12/18	Wed 9/1/19	100%	0 days					
29	Wall Stem of Retaining Wall RW1 Bay 10-13	30 days	Wed 14/11/18	Tue 18/12/18	100%	0 days					
30	Wall Stem of Retaining Wall RW1 Bay 14-17	23 days	Mon 26/11/18	Fri 21/12/18	100%	0 days					
31	Protective Coating / Subsoil Drain / Filter Layer	5 days	Thu 14/2/19	Tue 19/2/19	100%	0 days					
32	Drainage and Maintenance Access in front of RW1	75 days	Tue 26/3/19	Thu 20/6/19	100%	0 days					
33	Construction CP1X & CP7X	102 days	Mon 1/4/19	Sat 27/7/19	100%	0 days					
34	Filling Works behind Retaining Wall and Fill Slope FS1 South (Section 12 at Drawing C1/GE/1030)	705 days	Mon 1/4/19	Tue 17/8/21	47%	373.86 days					
35	Behind Retaining Wall RW1, Filling Stage 1 (up to +25mPD)	95 days	Mon 1/4/19	Fri 19/7/19	100%	0 days					
36	FS1 South , Filling (Rolling by Pass) (+25 to +27.8mPD)	10 days	Sat 20/7/19	Wed 31/7/19	100%	0 days					
37	FS1 South Filling Stage 2 (~-2.5m, +25.0 to +27.5 mPD)	56 days	Wed 1/4/20	Thu 4/6/20	100%	0 days					
38	Filling (Rolling by Pass)	1 day	Wed 1/4/20	Wed 1/4/20	100%	0 days					
39	Filling in 3m Zone	28 days	Thu 2/4/20	Mon 11/5/20	100%	0 days					
40	Benching Works for Rolling by Pass Surface	3 days	Thu 2/4/20	Mon 6/4/20	100%	0 days					
41	Lay Rockfill Layer (4.5/1m per 5 days)	25 days	Tue 7/4/20	Mon 11/5/20	100%	0 days					
42	Drainage and Maintenance Access (+25 to +27.5 mpD)	21 days	Tue 12/5/20	Thu 4/6/20	100%	0 days					
43	FS1 South Filling Stage 3 (~-7.5m height, +27.5 to +35mPD)	320 days	Sat 1/2/20	Mon 8/2/21	45%	175.69 days					
44	Filling (Rolling by Pass)(~7.5m, 0.5m per day)	175 days	Sat 1/2/20	Tue 1/9/20	4%	168 days					
45	Filling in 3m Zone	103 days	Wed 2/9/20	Wed 6/1/21	100%	0 days					
46	Benching Works for Rolling by Pass Surface	3 days	Wed 2/9/20	Fri 4/9/20	100%	0 days					
47	Lay Rockfill Layer (7.5/1m per 5 days)	100 days	Sat 5/9/20	Wed 6/1/21	100%	0 days					
48	Drainage and Maintenance Access (+27.5 to +35 mpD)	28 days	Thu 7/1/21	Mon 8/2/21	100%	0 days					
49	FS1 South Filling Stage 4 (~-7.5m height, +35 to +42.5mPD)	188 days	Wed 2/9/20	Thu 8/4/21	20%	150.81 days					
50	Filling (Rolling by Pass)(~7.5m, 0.5m per day)	15 days	Wed 2/9/20	Fri 18/9/20	100%	0 days					
51	Filling in 3m Zone	41 days	Thu 7/1/21	Fri 26/2/21	7%	38 days					
52	Benching Works for Rolling by Pass Surface	3 days	Thu 7/1/21	Sat 9/1/21	100%	0 days					
53	Lay Rockfill Layer (7.5/1m per 5 days)	38 days	Mon 11/1/21	Fri 26/2/21	0%	38 days					
54	Drainage and Maintenance Access (+35 to +42.5mpD)	35 days	Sat 27/2/21	Thu 8/4/21	0%	35 days					
55	FS1 South Filling Stage 5 (~-7.5m height, +42.5 to +50mPD)	536 days	Mon 2/12/19	Tue 17/8/21	17%	443.59 days					
56	Construction of RW11	30 days	Mon 2/12/19	Wed 8/1/20	100%	0 days					
57	Filling in 3m Zone	109 days	Sat 27/2/21	Mon 12/7/21	0%	109 days					
58	Benching Works for Rolling by Pass Surface	3 days	Sat 27/2/21	Tue 2/3/21	0%	3 days					
59	Lay Rockfill Layer (7.5/1m per 5 days)	102 days	Wed 3/3/21	Wed 7/7/21	0%	102 days					
60	Additional Plate Load Test at FS1	4 days	Thu 8/7/21	Mon 12/7/21	0%	4 days					
61	Drainage and Maintenance Access (+42.4 to +50 mpD)	35 days	Thu 8/7/21	Tue 17/8/21	0%	35 days					
62	Fill Slope FS1 Middle (Section 13 at Drawing C1/GE/1030)	386 days	Mon 10/2/20	Sat 29/5/21	100%	0 days					
63	Drainage and Maintenance Access at toe (+13 mpD)	10 days	Mon 10/2/20	Thu 20/2/20	100%	0 days					
64	FS1 middle Filling Stage 1 (~-7.0m max, +13.0 mPD to +20 mPD)	22 days	Fri 21/2/20	Tue 17/3/20	100%	0 days					
65	Filling (Rolling by Pass)(~2m, 0.5m per day)	4 days	Fri 21/2/20	Tue 25/2/20	100%	0 days					
66	Filling in 3m Zone	8 days	Wed 26/2/20	Thu 5/3/20	100%	0 days					
67	Benching Works for Rolling by Pass Surface	3 days	Wed 26/2/20	Fri 28/2/20	100%	0 days					
68	Lay Filter Layer	5 days	Sat 29/2/20	Thu 5/3/20	100%	0 days					
69	Drainage and Maintenance Access (at and below+20 mpD)	10 days	Fri 6/3/20	Tue 17/3/20	100%	0 days					
70	FS1 middle Filling Stage 2 (~-7.5m, +20.0 to +27.5 mPD)	53 days	Wed 26/2/20	Mon 4/5/20	100%	0 days					
71	Filling (Rolling by Pass)(~7.5m, 0.5m per day)	15 days	Wed 26/2/20	Fri 13/3/20	100%	0 days					
72	Filling in 3m Zone	23 days	Sat 14/3/20	Tue 14/4/20	100%	0 days					
73	Benching Works for Rolling by Pass Surface	3 days	Sat 14/3/20	Tue 17/3/20	100%	0 days					
74	Lay Rockfill Layer (7.5m/1m per 5 day)	20 days	Wed 18/3/20	Tue 14/4/20	100%	0 days					
75	Drainage and Maintenance Access (at and below+27.5 mpD)	15 days	Wed 15/4/20	Mon 4/5/20	100%	0 days					
76	FS1 middle Filling Stage 3 (~-7.5m height, +27.5 to +35mPD)	283 days	Sat 14/3/20	Fri 26/2/21	100%	0 days					

Task Summary Progress Inactive Milestone Manual Task Manual Summary Rollup Start-only Manual Progress
 Milestone Critical Inactive Task Inactive Summary Duration-only Manual Summary Finish-only

3 Month Rolling Programme (June 2022 to Aug 2022)

ID	Task Name	Duration	Start	Finish	% Complete	Remaining Duration	2022				
							5	6	7	8	9
77	Filling (Rolling by Pass)(~7.5m, 0.5m per day)	130 days	Sat 14/3/20	Fri 21/8/20	100%	0 days					
78	Filling in 3m Zone	133 days	Sat 22/8/20	Sat 30/1/21	100%	0 days					
79	Benching Works for Rolling by Pass Surface	3 days	Sat 22/8/20	Tue 25/8/20	100%	0 days					
80	Lay Rockfill Layer (7.5m/1m per 5 day)	130 days	Wed 26/8/20	Sat 30/1/21	100%	0 days					
81	Drainage and Maintenance Access (at and below +35 mpD)	20 days	Mon 1/2/21	Fri 26/2/21	100%	0 days					
82	FS1 middle Filling Stage 4 (~7.5m height, +35 to +42.5mPD)	241 days	Sat 22/8/20	Sat 29/5/21	100%	0 days					
83	Filling (Rolling by Pass)(~7.5m, 0.5m per day)	15 days	Sat 22/8/20	Tue 8/9/20	100%	0 days					
84	Filling in 3m Zone	41 days	Sat 27/2/21	Mon 19/4/21	100%	0 days					
85	Benching Works for Rolling by Pass Surface	3 days	Sat 27/2/21	Tue 2/3/21	100%	0 days					
86	Lay Rockfill Layer (7.5/1m per 5 days)	38 days	Wed 3/3/21	Mon 19/4/21	100%	0 days					
87	Drainage and Maintenance Access (+35 to +42.5mpD)	35 days	Tue 20/4/21	Sat 29/5/21	100%	0 days					
88	FS1 middle Filling Stage 5 below +42.5mPD and +50mPD)	30 days	Tue 20/4/21	Wed 26/5/21	100%	0 days					
89	Filling (Rolling by Pass)(~15m, 0.5m per day)	30 days	Tue 20/4/21	Wed 26/5/21	100%	0 days					
90	Slope Surface forming/ Drainage and Maintenance Access	20 days	Tue 20/4/21	Thu 13/5/21	100%	0 days					
91	Fill Slope FS1 North (Section 14 at Drawing C1/GE/1030)	900 days	Wed 11/7/18	Thu 22/7/21	80%	179.24 days					
92	CE16	264 days	Wed 11/7/18	Fri 31/5/19	38%	164 days					
93	FS1 North Filling Works Stage 1 (+15 to+19.7mPD)	204 days	Sat 1/6/19	Fri 24/1/20	100%	0 days					
94	Drainage and Maintenance Access (+15 to +20 mpD)	28 days	Sat 25/1/20	Wed 26/2/20	100%	0 days					
95	Construction of Outfall CP2X	14 days	Thu 27/2/20	Fri 13/3/20	100%	0 days					
96	FS1North , Filling (Rolling by Pass) (+19.7 to +22.4mPD)	20 days	Sat 14/3/20	Mon 6/4/20	100%	0 days					
97	FS1 North Filling Stage 2 (+20 to +27.5 mPD)	100 days	Tue 7/4/20	Fri 31/7/20	100%	0 days					
98	Drainage and Maintenance Access (+20 to +27.5 mpD)	65 days	Sat 1/8/20	Thu 15/10/20	100%	0 days					
99	Filling in 3m Zone (below +27.5mPD)	58 days	Mon 9/3/20	Thu 21/5/20	100%	0 days					
100	Benching Works for Rolling by Pass Surface	3 days	Mon 9/3/20	Wed 11/3/20	100%	0 days					
101	Lay Filter Layer	5 days	Thu 12/3/20	Tue 17/3/20	100%	0 days					
102	Filling by SRT (7.5m/ 3 day per 5 day)	50 days	Wed 18/3/20	Thu 21/5/20	100%	0 days					
103	Filling in 3m Zone (below +27.5mPD) (Rockfill)	23 days	Mon 9/3/20	Fri 3/4/20	100%	0 days					
104	Benching Works for Rolling by Pass Surface	3 days	Mon 9/3/20	Wed 11/3/20	100%	0 days					
105	Lay Rockfill Layer (7.5m/1m per 5 day)	20 days	Thu 12/3/20	Fri 3/4/20	100%	0 days					
106	Drainage and Maintenance Access	22 days	Sat 2/5/20	Wed 27/5/20	100%	0 days					
107	FS1 North Filling Stage 3 (+27 to +35 mPD)	171 days	Tue 26/11/19	Thu 11/6/20	100%	0 days					
108	Filling (Rolling by Pass)(~3m, 0.5m per day)	6 days	Tue 26/11/19	Mon 2/12/19	100%	0 days					
109	Drainage and Maintenance Access (+27.5 to +35 mpD)	30 days	Fri 8/5/20	Thu 11/6/20	100%	0 days					
110	FS1 North Filling Stage 4 (+35 to +42.5 mPD), Upgrading of Existing Slope Feature 3NW-C/F37	229 days	Fri 12/6/20	Fri 5/3/21	100%	0 days					
111	Filling (Rolling by Pass)(~3m, 0.5m per day)	20 days	Fri 12/6/20	Tue 7/7/20	100%	0 days					
112	Drainage and Maintenance Access (+35 to +42.5 mpD)	30 days	Sat 30/1/21	Fri 5/3/21	100%	0 days					
113	FS1 North Filling Stage 5 (+42.5 to +50mPD), Upgrading of Existing Slope Feature 3NW-C/F37	62 days	Wed 12/5/21	Thu 22/7/21	60%	24.8 days					
114	Filling (Rolling by Pass)(~3m, 0.5m per day)	30 days	Wed 12/5/21	Thu 17/6/21	70%	9 days					
115	Drainage and Maintenance Access (+42.5 to +50 mpD)	30 days	Fri 18/6/21	Thu 22/7/21	50%	15 days					
116	Civil Works for Pick-up/Drop-off area (Part A1, M011 CH020 to CH140)	162 days	Sat 6/3/21	Sat 18/9/21	0%	162 days					
117	Waterworks / Drainage / Sewerage/ Utilities Works	131 days	Sat 6/3/21	Fri 13/8/21	0%	131 days					
118	Sewerage Works / Drainage Works	90 days	Sat 6/3/21	Fri 25/6/21	0%	90 days					
119	Watermain FW1a (CH29-100)	20 days	Wed 31/3/21	Mon 26/4/21	0%	20 days					
120	Road Lighting Civil Works Provision	20 days	Thu 22/7/21	Fri 13/8/21	0%	20 days					
121	Utilities (by others)	10 days	Wed 31/3/21	Wed 14/4/21	0%	10 days					
122	Carriageway and Footway	72 days	Sat 26/6/21	Sat 18/9/21	0%	72 days					
123	Backfilling to Formation Level	30 days	Sat 26/6/21	Sat 31/7/21	0%	30 days					
124	Carriageway	30 days	Mon 2/8/21	Sat 4/9/21	0%	30 days					
125	Footpath, Road Marking and Street Furniture	12 days	Mon 6/9/21	Sat 18/9/21	0%	12 days					
126	Landscape Works	172 days	Sat 6/3/21	Sat 2/10/21	0%	172 days					
127	Shrubs Planting at RW1	30 days	Wed 18/8/21	Tue 21/9/21	0%	30 days					
128	Woodland Planting at Site 3	10 days	Wed 18/8/21	Sat 28/8/21	0%	10 days					
129	Hydroseeding at Fill Slope	80 days	Sat 6/3/21	Sat 12/6/21	0%	80 days					
130	Shrubs Planting at Pick-up/ Drop Off	10 days	Fri 23/7/21	Tue 3/8/21	0%	10 days					
131	Irrigation System and Water Points (Except Water Connection)	24 days	Mon 2/8/21	Sat 28/8/21	0%	24 days					
132	Tree Planting Works	10 days	Mon 20/9/21	Sat 2/10/21	0%	10 days					
133	Section 2 of the Works (Parts B1, B2, C, D, F, G1 & G2)	1232 days	Fri 15/12/17	Mon 14/2/22	64%	441.46 days					
134	Part B1	1103 days	Sat 28/4/18	Thu 13/1/22	75%	273.48 days					
135	Ground Investigation and Geotechnical instrumentation for Commencement of Slopework	96 days	Sat 28/4/18	Wed 22/8/18	100%	0 days					
136	Verification Drillholes (10 Nos., VDH3, 6, 10-15,19-20) and Preliminary Results Submission	95 days	Sat 28/4/18	Tue 21/8/18	100%	0 days					
137	Design Review	36 days	Thu 12/7/18	Wed 22/8/18	100%	0 days					
138	Cut Slopes CS1 & CS2	170 days	Fri 12/10/18	Mon 13/5/19	100%	0 days					
139	Excavation (crest to +55mPD)	4 days	Fri 12/10/18	Tue 16/10/18	100%	0 days					
140	Excavation (+55 to+50mPD)	11 days	Fri 12/10/18	Wed 24/10/18	100%	0 days					
141	Drainage and Maintenance Access (at +55mPD berm)	55 days	Tue 16/10/18	Tue 18/12/18	100%	0 days					
142	Drainage and Maintenance Access (+55 to +50 slope surface)	180 days	Tue 16/10/18	Mon 13/5/19	100%	0 days					
143	Cut Slope CS3	251 days	Wed 4/11/20	Tue 7/9/21	100%	0 days					
144	Excavation (crest to toe)	15 days	Wed 4/11/20	Fri 20/11/20	100%	0 days					
145	Drainage and Maintenance Access	29 days	Sat 21/11/20	Thu 24/12/20	100%	0 days					
146	Southern End of CS13	95 days	Mon 17/5/21	Tue 7/9/21	100%	0 days					
147	Slope Cutting and Soil Nail	60 days	Mon 17/5/21	Wed 28/7/21	100%	0 days					
148	Construction of toe wall (5 bays, approx. 66m) (4 days/ bay)	20 days	Thu 29/7/21	Fri 20/8/21	100%	0 days					
149	Backfilling and drainage	15 days	Sat 21/8/21	Tue 7/9/21	100%	0 days					
150	Cut Slopes CS11 , CS12 and CS13	880 days	Thu 23/8/18	Wed 11/8/21	99%	9.69 days					
151	Slope Cutting (crest to+94.5mPD)	31 days	Thu 23/8/18	Fri 28/9/18	100%	0 days					
152	Drainage and Maintenance Access (at crest)	29 days	Tue 2/10/18	Mon 5/11/18	100%	0 days					
153	Slope Cutting and Soil Nail (+94.5 to +87mPD, 59 nos. of Soil Nail)	40 days	Sat 6/10/18	Thu 22/11/18	100%	0 days					

Task Summary Progress Inactive Milestone Manual Task Manual Summary Rollup Start-only Manual Progress
 Milestone Critical Inactive Task Inactive Summary Duration-only Manual Summary Finish-only

3 Month Rolling Programme (June 2022 to Aug 2022)

ID	Task Name	Duration	Start	Finish	% Complete	Remaining Duration	2022				
							5	6	7	8	9
154	Drainage and Maintenance Access (at +94.5mPD berm)	7 days	Fri 26/10/18	Fri 2/11/18	100%	0 days					
155	Drainage and Maintenance Access (+94.5 to +87mPD slope surface)+ GI Works	24 days	Fri 26/10/18	Thu 22/11/18	100%	0 days					
156	Slope Cutting and Soil Nail (+87 to+79.5mPD, 84Nos. of Soil Nail)	40 days	Thu 8/11/18	Mon 24/12/18	100%	0 days					
157	Drainage and Maintenance Access (at +87mPD berm)	33 days	Fri 26/10/18	Mon 3/12/18	100%	0 days					
158	RFI50 (Waiting Instruction / Abortive Works / Additional Earthwork+25m Uchannel at CS13crest)	61 days	Thu 22/11/18	Mon 4/2/19	100%	0 days					
159	RFI(Slope Cutting and Soil Nail - additional 24 Nos. of Soil Nail)	39 days	Fri 11/1/19	Thu 28/2/19	100%	0 days					
160	RFI50(Additional Drainage and Maintenance Access (at 87mPD berm)	13 days	Fri 1/2/19	Tue 19/2/19	100%	0 days					
161	Drainage and Maintenance Access (+79.5 to +87mPD slope surface)+ GI Works	10 days	Fri 8/2/19	Tue 19/2/19	100%	0 days					
162	Slope Cutting and Soil Nail (+72 to +79.5,115+21Nos. of Soil Nail)	90 days	Mon 21/1/19	Wed 15/5/19	100%	0 days					
163	Drainage and Maintenance Access (at +79.5mPD berm)	42 days	Fri 1/2/19	Mon 25/3/19	100%	0 days					
164	Drainage and Maintenance Access (+72 to +79.5mPD slope surface, CS13 crest)+ GI Works	13 days	Thu 2/5/19	Fri 17/5/19	100%	0 days					
165	Slope Cutting and Soil Nail (+64.5 to +72 mPD, ,192 Nos. of Soil Nail)	67 days	Mon 8/4/19	Tue 2/7/19	100%	0 days					
166	Drainage and Maintenance Access (at +72mPD berm)	29 days	Sat 13/4/19	Wed 22/5/19	100%	0 days					
167	Drainage and Maintenance Access (+64.5 to +72mPD slope surface)+ GI Works	17 days	Wed 3/7/19	Mon 22/7/19	100%	0 days					
168	Slope Cutting and Soil Nail (+57 to +64.5mPD, 521 nos. of Soil Nail, 96 nos. of Raking Drain)	180 days	Tue 2/7/19	Thu 6/2/20	100%	0 days					
169	Drainage and Maintenance Access (at +64.5mPD berm)	40 days	Tue 6/8/19	Sat 21/9/19	100%	0 days					
170	Drainage and Maintenance Access (+57 to +64.5mPD slope surface)+ GI Works	17 days	Fri 7/2/20	Wed 26/2/20	100%	0 days					
171	Slope Cutting and Soil Nail for CS11 (+57 to +49.5 mPD, 88 nos. of Soil Nail, 19 nos. of Raking Drain)	38 days	Thu 12/3/20	Wed 29/4/20	100%	0 days					
172	Drainage and Maintenance Access for CS11 (at +57mPD berm)	20 days	Thu 26/3/20	Wed 22/4/20	100%	0 days					
173	Drainage and Maintenance Access for CS11 (below57 mPD slope surface/ on RW11)+ GI Works	17 days	Sat 2/5/20	Thu 21/5/20	100%	0 days					
174	Slope Cutting and Soil Nail for CS12/CS13 (+57 to +49.5 mPD, 497 nos. of Soil Nail, 80 nos. of Raking Drain)	85 days	Fri 7/2/20	Fri 22/5/20	100%	0 days					
175	Drainage and Maintenance Access for CS12/13 (at +57mPD berm)	35 days	Wed 11/3/20	Fri 24/4/20	100%	0 days					
176	Drainage and Maintenance Access for CS12/CS13 (+49.5 to + 57mPD slope surface)+ GI Works	20 days	Sat 23/5/20	Mon 15/6/20	100%	0 days					
177	Slope Cutting and Soil Nail for CS12/CS13 (+42 to +49.5 mPD, 383 nos. of Soil Nail, 87 nos. of Raking Drain)	170 days	Tue 2/6/20	Tue 22/12/20	100%	0 days					
178	Drainage and Maintenance Access for CS12/13 (at +49.5mPD berm)	42 days	Fri 3/7/20	Thu 20/8/20	100%	0 days					
179	Drainage and Maintenance Access for CS12/CS13 (+42 to +49.5mPD slope surface)+ GI Works	17 days	Sat 29/8/20	Thu 17/9/20	100%	0 days					
180	Slope Cutting and Soil Nail for CS13 (+42 to +34.5 mPD, 126 nos. of Soil Nail, 55 nos. of Raking Drain)	59 days	Wed 23/12/20	Mon 8/3/21	100%	0 days					
181	Drainage and Maintenance Access for CS13 (at +42mPD berm)	28 days	Tue 19/1/21	Tue 23/2/21	100%	0 days					
182	Drainage and Maintenance Access for CS13 (+34.5 to +42mPD slope surface)+ GI Works	25 days	Tue 9/3/21	Fri 9/4/21	100%	0 days					
183	Slope Cutting and Soil Nail for CS13 (+34.5 mPD to toe, 73 nos. of Soil Nail, 27 nos. of Raking Drain)	100 days	Tue 16/3/21	Sat 17/7/21	100%	0 days					
184	Drainage and Maintenance Access for CS13 (at +34.5mPD berm)	27 days	Mon 12/4/21	Thu 13/5/21	100%	0 days					
185	Drainage and Maintenance Access for CS13 (below+34.5 mPD slope surface)+ GI Works	21 days	Mon 19/7/21	Wed 11/8/21	20%	16.8 days					
186	Retaining Wall RW11	98 days	Tue 12/11/19	Wed 11/3/20	100%	0 days					
187	General Excavation with ELS to Formation Level RW11 Bay 1-4	30 days	Tue 12/11/19	Mon 16/12/19	100%	0 days					
188	Plate Load Test and Blinding Layer for RW11 Bays 1-4	5 days	Tue 17/12/19	Sat 21/12/19	100%	0 days					
189	Base slab of Retaining Wall RW11 Bay 1-4	10 days	Sun 22/12/19	Mon 6/1/20	100%	0 days					
190	Wall Stem of Retaining Wall RW11 Bay 1-4	20 days	Mon 13/1/20	Fri 7/2/20	100%	0 days					
191	Plate Load Test and Blinding Layer for RW11 Bays 5-6	5 days	Tue 17/12/19	Sat 21/12/19	100%	0 days					
192	Base slab of Retaining Wall RW11 Bay 5-6	10 days	Sun 22/12/19	Mon 6/1/20	100%	0 days					
193	Wall Stem of Retaining Wall RW11 Bay 5-6	20 days	Tue 7/1/20	Sat 1/2/20	100%	0 days					
194	Protective Coating / Subsoil Drain / Filter Layer	5 days	Sat 8/2/20	Thu 13/2/20	100%	0 days					
195	Filling Works behind Retaining Wall RW11, (~5.8m, up to +54.8mPD)	23 days	Fri 14/2/20	Wed 11/3/20	100%	0 days					
196	Existing Slope Upgrading Works	210 days	Tue 1/12/20	Tue 17/8/21	70%	62.4 days					
197	Existing Feature 3NW-C/C256 Rock Joint Mapping, drainage and maintenance access	150 days	Tue 1/12/20	Mon 24/5/21	32%	102 days					
198	Existing Feature 3NW-C/C258 Slope Upgrading Works	200 days	Mon 28/12/20	Tue 17/8/21	99%	2 days					
199	Slope Cutting and Soil Nail (Crest to To, 29 Nos. of Soil Nail)	100 days	Mon 28/12/20	Thu 22/4/21	100%	0 days					
200	Drainage and Maintenance Access (Crest)	100 days	Fri 23/4/21	Tue 17/8/21	98%	2 days					
201	Cut Slope CS15, CS16 and CS17	753 days	Thu 16/8/18	Mon 1/3/21	100%	0 days					
202	Slope Cutting and Soil Nail (crest to+69.5mPD,25 nos. of Soil Nail)	36 days	Thu 16/8/18	Thu 27/9/18	100%	0 days					
203	Drainage and Maintenance Access (at crest)	15 days	Mon 20/8/18	Wed 5/9/18	100%	0 days					
204	Slope Cutting and Soil Nail (+62 to +69.5mPD, 99 nos. of Soil Nail, 37 nos. of Raking Drain)	62 days	Mon 3/9/18	Fri 16/11/18	100%	0 days					
205	Drainage and Maintenance Access (at +69.5mPD berm)	49 days	Mon 3/9/18	Thu 1/11/18	100%	0 days					
206	Drainage and Maintenance Access (+62 to +69.5mPD slope surface)+ GI Works	36 days	Fri 26/10/18	Thu 6/12/18	100%	0 days					
207	Slope Cutting and Soil Nail (+54.5 to +62mPD, 237 nos. of Soil Nail, 58 nos. of Raking Drain)	66 days	Wed 7/11/18	Fri 25/1/19	100%	0 days					
208	Drainage and Maintenance Access (at +62mPD berm)	26 days	Wed 7/11/18	Thu 6/12/18	100%	0 days					
209	Drainage and Maintenance Access (+54.5 to +62mPD slope surface)+ GI Works	38 days	Sat 29/12/18	Fri 15/2/19	100%	0 days					
210	Slope Cutting and Soil Nail (+47 to +54.5mPD, 548 nos. of Soil Nail, 86 nos. of Raking Drain)	155 days	Mon 7/1/19	Thu 18/7/19	100%	0 days					
211	Drainage and Maintenance Access (at +54.5mPD berm)	61 days	Sat 19/1/19	Wed 3/4/19	100%	0 days					
212	Drainage and Maintenance Access (+54.5 to +47mPD slope surface)+ GI Works	90 days	Wed 3/4/19	Thu 25/7/19	100%	0 days					
213	Slope Cutting and Soil Nail (+39.5 to +47mPD, 490 nos. of Soil Nail, 107 nos. of Raking Drain)	94 days	Mon 6/5/19	Mon 26/8/19	100%	0 days					
214	Drainage and Maintenance Access (at +47mPD berm)	38 days	Tue 2/7/19	Wed 14/8/19	100%	0 days					
215	Drainage and Maintenance Access (+39.5 to +47mPD slope surface)+ GI Works	23 days	Tue 27/8/19	Mon 23/9/19	100%	0 days					
216	Slope Cutting and Soil Nail (+39.5 to toe, 83 nos. of Soil Nail, 18nos. of Raking Drain)	59 days	Mon 4/5/20	Mon 13/7/20	100%	0 days					
217	Drainage and Maintenance Access (at +39.5mPD berm and Slope Surface) + GI Works	45 days	Tue 5/1/21	Mon 1/3/21	100%	0 days					
218	Fill Slope FS17	52 days	Fri 2/7/21	Tue 31/8/21	42%	30.4 days					
219	Drainage and Maintenance Access at toe	28 days	Fri 2/7/21	Tue 3/8/21	0%	28 days					
220	FS17 Filling Stage 1 (~2.5m max)	24 days	Wed 4/8/21	Tue 31/8/21	90%	2.4 days					
221	Civil Works for Sha Ling Road (M001 CH710 to CH825, MO11 CH00 to CH20, M014)	224 days	Mon 28/12/20	Tue 28/9/21	28%	162.34 days					
222	Waterworks / Drainage / Sewerage/ Utilities Works	27 days	Mon 28/12/20	Thu 28/1/21	0%	27 days					
223	Sewerage Works / Drainage Works	18 days	Mon 28/12/20	Mon 18/1/21	0%	18 days					
224	Watermain FW1 (CH532-637), FW1a (CH000-029) and FW2 (CH530-618)	15 days	Tue 12/1/21	Thu 28/1/21	0%	15 days					
225	Road Lighting Civil Works Provision	8 days	Tue 12/1/21	Wed 20/1/21	0%	8 days					

Task Summary Progress Inactive Milestone Manual Task Manual Summary Rollup Start-only Manual Progress
 Milestone Critical Inactive Task Inactive Summary Duration-only Manual Summary Finish-only

3 Month Rolling Programme (June 2022 to Aug 2022)

ID	Task Name	Duration	Start	Finish	% Complete	Remaining Duration	2022				
							5	6	7	8	9
226	Utilities (by others)	3 days	Tue 12/1/21	Thu 14/1/21	0%	3 days					
227	Carriageway and Footway	57 days	Fri 23/7/21	Tue 28/9/21	49%	29.2 days					
228	Backfilling to Formation Level	11 days	Fri 23/7/21	Wed 4/8/21	100%	0 days					
229	Carriageway	28 days	Thu 5/8/21	Mon 6/9/21	60%	11.2 days					
230	Footpath, Road Marking and Street Furniture	18 days	Tue 7/9/21	Tue 28/9/21	0%	18 days					
231	Civil Works for PDA (PT04, PT05, PT06, PT07 and PT08)	381.1 days	Fri 5/6/20	Tue 14/9/21	88%	44.05 days					
232	Waterworks / Drainage / Sewerage/ Utilities Works	238 days	Fri 5/6/20	Mon 22/3/21	100%	0 days					
233	Drainage Works (with Petrol Interceptor)	200 days	Fri 5/6/20	Tue 2/2/21	100%	0 days					
234	Road Lighting Civil Works Provision	10 days	Thu 11/3/21	Mon 22/3/21	100%	0 days					
235	Carriageway and Footway	143.1 days	Tue 23/3/21	Tue 14/9/21	73%	37.98 days					
236	Backfilling to Formation Level	80 days	Tue 23/3/21	Wed 30/6/21	85%	12 days					
237	Carriageway	60 days	Sat 10/4/21	Thu 19/8/21	85%	9 days					
238	Footpath, Road Marking and Street Furniture	22 days	Thu 19/8/21	Tue 14/9/21	0%	22 days					
239	Civil Works for PDA (M011 CH140-215,M08 CH70-102)	161 days	Tue 9/3/21	Mon 20/9/21	21%	126.67 days					
240	Waterworks / Drainage / Sewerage/ Utilities Works	90 days	Tue 9/3/21	Mon 28/6/21	40%	53.78 days					
241	Sewerage Works / Drainage Works	60 days	Tue 9/3/21	Sat 22/5/21	30%	41.8 days					
242	Road Lighting Civil Works Provision	10 days	Mon 29/3/21	Wed 16/6/21	70%	3 days					
243	Utilities (by others)	10 days	Thu 17/6/21	Mon 28/6/21	70%	3 days					
244	Carriageway and Footway	71 days	Tue 29/6/21	Mon 20/9/21	0%	71 days					
245	Backfilling to Formation Level	30 days	Tue 29/6/21	Tue 3/8/21	0%	30 days					
246	Carriageway	30 days	Wed 4/8/21	Tue 7/9/21	0%	30 days					
247	Footpath, Road Marking and Street Furniture	11 days	Wed 8/9/21	Mon 20/9/21	0%	11 days					
248	Civil Works for Sha Ling Road (M001 CH610-710)	114 days	Tue 9/3/21	Tue 27/7/21	53%	53.2 days					
249	Waterworks / Drainage / Sewerage/ Utilities Works	44 days	Tue 9/3/21	Mon 3/5/21	100%	0 days					
250	Sewerage Works / Drainage Works	30 days	Tue 9/3/21	Thu 15/4/21	100%	0 days					
251	Watermain FW1 (CH433-532) and FW2 (CH433-530)	30 days	Thu 25/3/21	Mon 3/5/21	100%	0 days					
252	Road Lighting Civil Works Provision	10 days	Thu 25/3/21	Thu 8/4/21	100%	0 days					
253	Utilities (by others)	10 days	Thu 25/3/21	Thu 8/4/21	100%	0 days					
254	Carriageway and Footway	70 days	Tue 4/5/21	Tue 27/7/21	0%	70 days					
255	Backfilling to Formation Level	30 days	Tue 4/5/21	Tue 8/6/21	0%	30 days					
256	Carriageway	30 days	Wed 9/6/21	Thu 15/7/21	0%	30 days					
257	Footpath, Road Marking and Street Furniture	10 days	Fri 16/7/21	Tue 27/7/21	0%	10 days					
258	Civil Works for Sha Ling Road (M001 CH480-610, M08 CH00-70)	555 days	Tue 3/3/20	Thu 13/1/22	19%	447.85 days					
259	Sewage Detention Tank Civil and Structural Works	549 days	Tue 3/3/20	Thu 6/1/22	25%	413.7 days					
260	Civil and Structural Works	74 days	Tue 3/3/20	Wed 3/6/20	80%	15 days					
261	Excavation by open cut	25 days	Tue 3/3/20	Tue 31/3/20	40%	15 days					
262	Blinding layer concreting	1 day	Wed 1/4/20	Wed 1/4/20	100%	0 days					
263	Construction of base slab	7 days	Thu 2/4/20	Tue 14/4/20	100%	0 days					
264	Construction of wall and top slab	20 days	Wed 15/4/20	Sat 9/5/20	100%	0 days					
265	Construction of manhole	7 days	Mon 11/5/20	Mon 18/5/20	100%	0 days					
266	Backgilling	14 days	Tue 19/5/20	Wed 3/6/20	100%	0 days					
267	VDS and AMS for Sewage Detention Tank (Permanent Design and Submission Approval)	350 days	Mon 18/5/20	Tue 20/7/21	23%	270 days					
268	VDS and AMS for Sewage Detention Tank	140 days	Wed 21/7/21	Thu 6/1/22	0%	140 days					
269	Waterworks / Drainage / Sewerage/ Utilities Works	146 days	Tue 4/5/21	Wed 27/10/21	0%	146 days					
270	Sewerage Works / Drainage Works	40 days	Wed 8/9/21	Wed 27/10/21	0%	40 days					
271	Watermain FW1 and FW2 (CH310-433)	17 days	Tue 4/5/21	Mon 24/5/21	0%	17 days					
272	Road Lighting Civil Works Provision	18 days	Tue 25/5/21	Tue 15/6/21	0%	18 days					
273	Utilities (by others)	17 days	Wed 16/6/21	Tue 6/7/21	0%	17 days					
274	Carriageway and Footway	64 days	Thu 28/10/21	Thu 13/1/22	0%	64 days					
275	Backfilling to Formation Level	12 days	Thu 28/10/21	Wed 10/11/21	0%	12 days					
276	Carriageway	32 days	Thu 11/11/21	Fri 17/12/21	0%	32 days					
277	Footpath, Road Marking and Street Furniture	20 days	Sat 18/12/21	Thu 13/1/22	0%	20 days					
278	Civil Works for Sha Ling Road (M001 CH360-480)	104 days	Wed 28/7/21	Mon 29/11/21	26%	76.47 days					
279	Waterworks / Drainage / Sewerage/ Utilities Works	67 days	Wed 28/7/21	Sat 16/10/21	36%	42.83 days					
280	Sewerage Works / Drainage Works	28 days	Wed 28/7/21	Sat 28/8/21	80%	5.6 days					
281	Watermain FW1 and FW2 (CH175-310)	18 days	Thu 19/8/21	Wed 8/9/21	80%	3.6 days					
282	Additional rising main (CE No. 181)	30 days	Thu 9/9/21	Sat 16/10/21	0%	30 days					
283	Road Lighting Civil Works Provision	15 days	Thu 19/8/21	Sat 4/9/21	0%	15 days					
284	Utilities (by others)	11 days	Thu 19/8/21	Tue 31/8/21	0%	11 days					
285	Carriageway and Footway	37 days	Mon 18/10/21	Mon 29/11/21	0%	37 days					
286	Backfilling to Formation Level	7 days	Mon 18/10/21	Mon 25/10/21	0%	7 days					
287	Carriageway	18 days	Tue 26/10/21	Mon 15/11/21	0%	18 days					
288	Footpath, Road Marking and Street Furniture	12 days	Tue 16/11/21	Mon 29/11/21	0%	12 days					
289	Civil Works for Sha Ling Road (M001 CH180-360)	109 days	Fri 6/8/21	Tue 14/12/21	0%	109 days					
290	Waterworks / Drainage / Sewerage/ Utilities Works	59 days	Fri 6/8/21	Sat 16/10/21	0%	59 days					
291	Drainage and Sewerage Works	40 days	Fri 6/8/21	Tue 21/9/21	0%	40 days					
292	Watermain FW1 and FW2 (CH000-175)	23 days	Tue 7/9/21	Tue 5/10/21	0%	23 days					
293	Road Lighting Civil Works Provision	22 days	Tue 7/9/21	Mon 4/10/21	0%	22 days					
294	Utilities (by others)	32 days	Tue 7/9/21	Sat 16/10/21	0%	32 days					
295	Carriageway and Footway	50 days	Mon 18/10/21	Tue 14/12/21	0%	50 days					
296	Backfilling to Formation Level	10 days	Mon 18/10/21	Thu 28/10/21	0%	10 days					
297	Carriageway	24 days	Fri 29/10/21	Thu 25/11/21	0%	24 days					
298	Footpath, Road Marking and Street Furniture	16 days	Fri 26/11/21	Tue 14/12/21	0%	16 days					
299	Part B2, G1 and G2	1232 days	Fri 15/12/17	Mon 14/2/22	69%	376.41 days					
300	Access Date for Part G1 and G2	0 days	Tue 5/2/19	Tue 5/2/19	0%	0 days					

Task Summary Progress Inactive Milestone Manual Task Manual Summary Rollup Start-only Manual Progress
 Milestone Critical Inactive Task Inactive Summary Duration-only Manual Summary Finish-only

3 Month Rolling Programme (June 2022 to Aug 2022)

ID	Task Name	Duration	Start	Finish	% Complete	Remaining Duration	2022	5	6	7	8	9	10
301	Land Decontamination Works	293 days	Tue 2/10/18	Thu 26/9/19	100%	0 days							
302	Re-appraisal and Contamination Assessment Plan (CAP) Submission to EPD	10 days	Tue 2/10/18	Fri 12/10/18	100%	0 days							
303	EPD Review and Acceptance for CAP	195 days	Fri 12/10/18	Wed 12/6/19	100%	0 days							
304	Environmental SI for Determination of Decontamination and SI Testing	70 days	Tue 28/5/19	Mon 19/8/19	100%	0 days							
305	Contamination Assessment Report (CAR) Submission to EPD	18 days	Tue 20/8/19	Mon 9/9/19	100%	0 days							
306	EPD Review and Acceptance for CAR	14 days	Tue 10/9/19	Thu 26/9/19	100%	0 days							
307	Civil Works for Sha Ling Road (M001 CH40-110)	717 days	Tue 21/5/19	Sat 16/10/21	83%	120.49 days							
308	Objection from Local Village (EW16 & 18)	355 days	Tue 21/5/19	Wed 29/7/20	100%	0 days							
309	Application for Road Closure / Road Diversion	17 days	Thu 30/7/20	Tue 18/8/20	100%	0 days							
310	Noise Barrier Bay 5 to Bay 8	322 days	Wed 19/8/20	Thu 16/9/21	89%	35.78 days							
311	General Excavation with ELS to Formation Level Bay 5 to Bay 8	15 days	Wed 19/8/20	Fri 4/9/20	100%	0 days							
312	Base slab of Noise Barrier Bay 5 to Bay 8	30 days	Thu 20/8/20	Wed 23/9/20	100%	0 days							
313	Wall Stem of Noise Barrier Bay 5 to Bay 8	30 days	Thu 24/9/20	Sat 31/10/20	100%	0 days							
314	Protective Coating /Temp Fill	5 days	Mon 2/11/20	Fri 6/11/20	100%	0 days							
315	Installation of panel	10 days	Mon 6/9/21	Thu 16/9/21	0%	10 days							
316	Waterworks / Drainage / Sewerage/ Utilities Works	70 days	Thu 13/5/21	Thu 5/8/21	60%	28 days							
317	Sewerage Works / Drainage Works	35 days	Thu 13/5/21	Thu 24/6/21	80%	7 days							
318	Watermain FW3 (CH045-105)	20 days	Wed 14/7/21	Thu 5/8/21	0%	20 days							
319	Road Lighting Civil Works Provision	10 days	Fri 25/6/21	Wed 7/7/21	80%	2 days							
320	Utilities (by others)	15 days	Fri 25/6/21	Tue 13/7/21	80%	3 days							
321	Carriageway and Footway	59 days	Fri 6/8/21	Sat 16/10/21	0%	59 days							
322	Backfilling to Formation Level	10 days	Fri 6/8/21	Tue 17/8/21	0%	10 days							
323	Carriageway	42 days	Wed 18/8/21	Thu 7/10/21	0%	42 days							
324	Footpath, Road Marking and Street Furniture	7 days	Fri 8/10/21	Sat 16/10/21	0%	7 days							
325	Ground Investigation and Geotechnical instrumentation for Commencement of Slopework	45 days	Fri 8/2/19	Mon 1/4/19	100%	0 days							
326	Trial Pit Excavation / Installation of Instruments and Preliminary Results Submission	45 days	Fri 8/2/19	Mon 1/4/19	100%	0 days							
327	Fill Slope FS13 and FS14	56 days	Fri 6/8/21	Tue 12/10/21	0%	56 days							
328	Drainage and Maintenance Access at toe	32 days	Fri 6/8/21	Sat 11/9/21	0%	32 days							
329	FS13 and FS14 Filling Stage 1 (~2.5m max)	24 days	Mon 13/9/21	Tue 12/10/21	0%	24 days							
330	Cut Slope CS14	20 days	Wed 13/10/21	Fri 5/11/21	0%	20 days							
331	Slope Cutting (crest to toe)	3 days	Wed 13/10/21	Sat 16/10/21	0%	3 days							
332	Drainage and Maintenance Access (at crest)	17 days	Mon 18/10/21	Fri 5/11/21	0%	17 days							
333	Civil Works for Sha Ling Road (M001 CH110-180)	104 days	Fri 8/10/21	Mon 14/2/22	0%	104 days							
334	Waterworks / Drainage / Sewerage/ Utilities Works	45 days	Fri 8/10/21	Tue 30/11/21	0%	45 days							
335	Sewerage Works / Drainage Works	30 days	Fri 8/10/21	Fri 12/11/21	0%	30 days							
336	Watermain FW3 (CH105-175)	12 days	Sat 13/11/21	Fri 26/11/21	0%	12 days							
337	Road Lighting Civil Works Provision	10 days	Sat 13/11/21	Wed 24/11/21	0%	10 days							
338	Utilities (by others)	15 days	Sat 13/11/21	Tue 30/11/21	0%	15 days							
339	Carriageway and Footway	59 days	Wed 1/12/21	Mon 14/2/22	0%	59 days							
340	Backfilling to Formation Level	10 days	Wed 1/12/21	Sat 11/12/21	0%	10 days							
341	Carriageway	42 days	Mon 13/12/21	Sat 5/2/22	0%	42 days							
342	Footpath, Road Marking and Street Furniture	7 days	Mon 7/2/22	Mon 14/2/22	0%	7 days							
343	Man Kam To Road Bus Shelter (PT01, PT02 and PT03)	1175 days	Fri 15/12/17	Thu 2/12/21	75%	288.62 days							
344	Used as Temporary Site Office / Storage Area	340 days	Fri 15/12/17	Mon 11/2/19	100%	0 days							
345	Investigation for DongJiang Watermain(CE23)	82 days	Thu 10/1/19	Tue 23/4/19	100%	0 days							
346	Works Area Handing Over to WSD as Request	198 days	Mon 15/4/19	Thu 12/12/19	100%	0 days							
347	Interface Issue with C2 (As request by Arup to delay XP application) (Including Temp. Road Diversion)	290 days	Tue 28/5/19	Tue 19/5/20	35%	188.75 days							
348	TTA and XP Application at Man Kam To Road	14 days	Wed 20/5/20	Thu 4/6/20	0%	14 days							
349	Works Area Handling to WSD for DongJiang Watermain Works	37 days	Wed 25/11/20	Sat 9/1/21	0%	37 days							
350	Waterworks / Drainage / Sewerage/ Utilities Works	180 days	Mon 11/1/21	Thu 19/8/21	77%	41.77 days							
351	Sewerage Work (Petrol Interceptor)	15 days	Fri 16/7/21	Mon 2/8/21	100%	0 days							
352	Sewerage Works / Drainage Works	150 days	Mon 11/1/21	Thu 15/7/21	90%	15 days							
353	Road Lighting Civil Works Provision	11 days	Fri 16/7/21	Wed 28/7/21	20%	8.8 days							
354	Utilities (by others)	30 days	Fri 16/7/21	Thu 19/8/21	20%	24 days							
355	Carriageway and Footway	117 days	Fri 16/7/21	Thu 2/12/21	76%	27.6 days							
356	Backfilling to Formation Level	12 days	Fri 20/8/21	Thu 2/9/21	95%	0.6 days							
357	Carriageway	56 days	Fri 3/9/21	Wed 10/11/21	95%	2.8 days							
358	Footpath, Road Marking and Street Furniture	19 days	Thu 11/11/21	Thu 2/12/21	30%	13.3 days							
359	Reinstatement to existing Man Kam To Road	5 days	Fri 16/7/21	Wed 21/7/21	0%	5 days							
360	Civil Works for Sha Ling Road (M001 CH00-40)	985 days	Thu 30/8/18	Wed 22/12/21	57%	422.53 days							
361	TTA and XP Application at Man Kam To Road	14 days	Fri 15/1/21	Sat 30/1/21	0%	14 days							
362	Works Area Handing Over to WSD as Request	120 days	Mon 6/5/19	Thu 26/9/19	80%	24 days							
363	Work Area Handling to Sang Hing for Turn Around	190 days	Mon 6/4/20	Tue 24/1/20	0%	190 days							
364	Works Area Handling to WSD for DongJiang Watermain Works	41 days	Wed 25/11/20	Thu 14/1/21	0%	41 days							
365	Consent from WSD for Works Near Dong Jing Watermain	325 days	Thu 30/8/18	Fri 4/10/19	99%	3.89 days							
366	Investigation works / Trial Pits for Watermains	150 days	Thu 30/8/18	Sat 2/3/19	100%	0 days							
367	Submission for Tempworks	104 days	Thu 21/2/19	Sat 29/6/19	100%	0 days							
368	Approval from WSD	80 days	Tue 2/7/19	Fri 4/10/19	95%	4 days							
369	Noise Barrier Bay 1-4	196 days	Mon 1/2/21	Wed 29/9/21	100%	0 days							
370	General Excavation with ELS to Formation Level Bay 1-4	30 days	Mon 1/2/21	Wed 10/3/21	100%	0 days							
371	Base slab of Noise Barrier Bay 1-4	30 days	Thu 11/3/21	Sat 17/4/21	100%	0 days							
372	Wall Stem of Noise Barrier Bay 1-4	15 days	Mon 19/4/21	Thu 6/5/21	100%	0 days							
373	Protective Coating /Temp Fill	5 days	Fri 7/5/21	Wed 12/5/21	100%	0 days							
374	Installation of panel	10 days	Fri 17/9/21	Wed 29/9/21	100%	0 days							
375	Waterworks / Drainage / Sewerage/ Utilities Works (RHS + Man Kam To EB Slow Lane)	62 days	Thu 13/5/21	Tue 27/7/21	68%	19.6 days							
376	Sewerage Works / Drainage Works	54 days	Thu 13/5/21	Sat 17/7/21	100%	0 days							

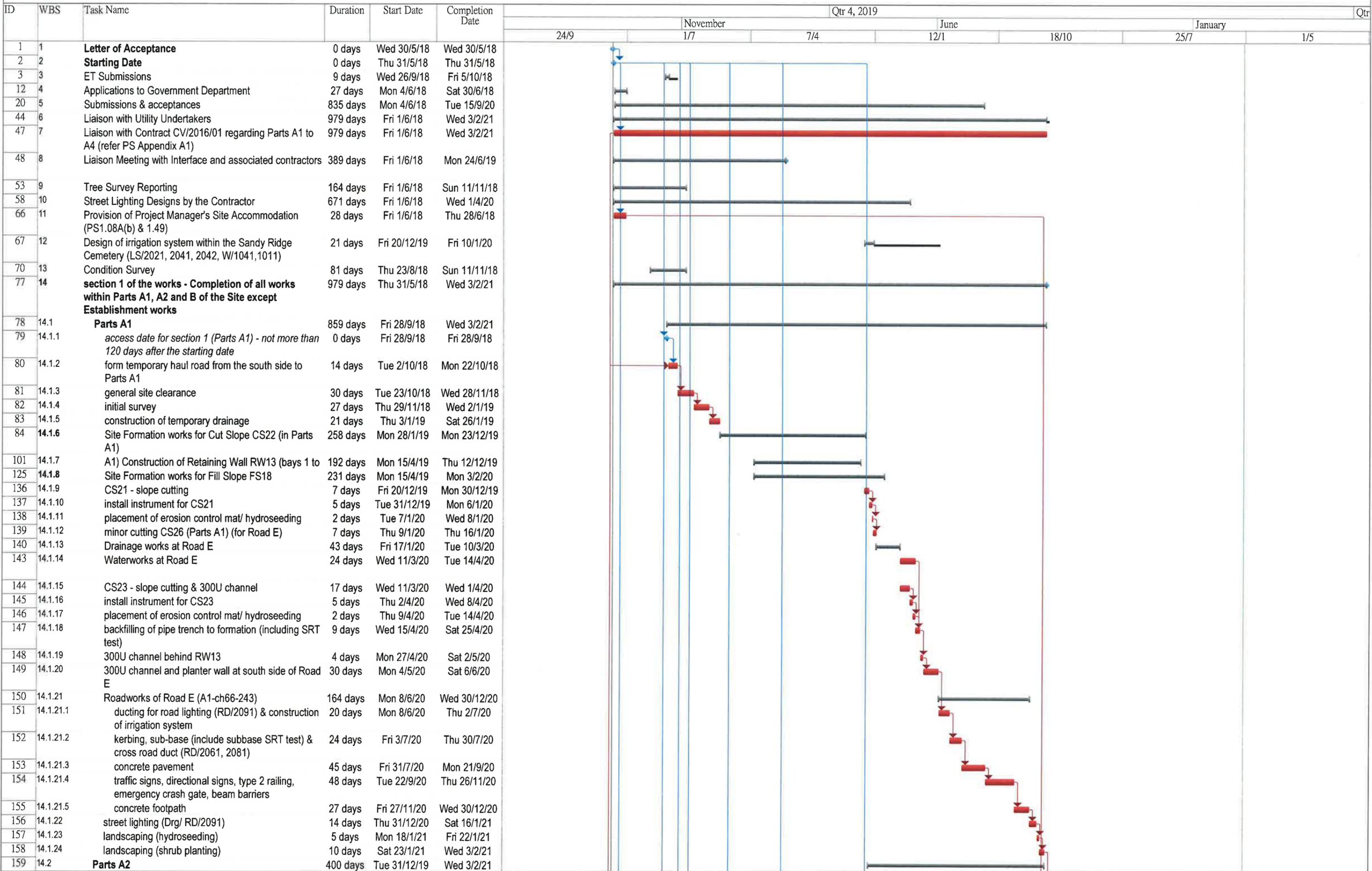
Task Summary Progress Inactive Milestone Manual Task Manual Summary Rollup Start-only Manual Progress
 Milestone Critical Inactive Task Inactive Summary Duration-only Manual Summary Finish-only

3 Month Rolling Programme (June 2022 to Aug 2022)

ID	Task Name	Duration	Start	Finish	% Complete	Remaining Duration	2022					
							5	6	7	8	9	10
377	Watermain FW3 (CH000-045)	6 days	Mon 19/7/21	Sat 24/7/21	50%	3 days						
378	Road Lighting Civil Works Provision	8 days	Mon 19/7/21	Tue 27/7/21	20%	6.4 days						
379	Utilities (by others)	25 days	Thu 13/5/21	Fri 11/6/21	20%	20 days						
380	Carriageway and Footway (RHS+ Man Kan To EB Slow Lane)	38 days	Wed 28/7/21	Thu 9/9/21	0%	38 days						
381	Backfilling to Formation Level	10 days	Wed 28/7/21	Sat 7/8/21	0%	10 days						
382	Carriageway	24 days	Mon 9/8/21	Sat 4/9/21	0%	24 days						
383	Footpath, Road Marking and Street Furniture	4 days	Mon 6/9/21	Thu 9/9/21	0%	4 days						
384	Waterworks / Drainage / Sewerage/ Utilities Works (LHS)	52 days	Mon 6/9/21	Mon 8/11/21	0%	52 days						
385	Sewerage Works / Drainage Works	42 days	Mon 6/9/21	Wed 27/10/21	0%	42 days						
386	Road Lighting Civil Works Provision	5 days	Thu 28/10/21	Tue 2/11/21	0%	5 days						
387	Utilities (by others)	10 days	Thu 28/10/21	Mon 8/11/21	0%	10 days						
388	Carriageway and Footway (LHS)	38 days	Tue 9/11/21	Wed 22/12/21	0%	38 days						
389	Backfilling to Formation Level	10 days	Tue 9/11/21	Fri 19/11/21	0%	10 days						
390	Carriageway	24 days	Sat 20/11/21	Fri 17/12/21	0%	24 days						
391	Footpath, Road Marking and Street Furniture	4 days	Sat 18/12/21	Wed 22/12/21	0%	4 days						
392	Part C	902 days	Sat 15/12/18	Fri 31/12/21	28%	648.67 days						
393	Consent from WSD for Works Near Dong Jing Watermain	702 days	Sat 15/12/18	Mon 3/5/21	34%	465.52 days						
394	Investigation works / Trial Pits for Watermains	60 days	Sat 15/12/18	Fri 1/3/19	100%	0 days						
395	Submission for Tempworks	102 days	Sat 23/2/19	Sat 29/6/19	100%	0 days						
396	Approval from WSD (RFI No.66) & Re-design the arrangement	546 days	Tue 2/7/19	Mon 3/5/21	14%	469.5 days						
397	Refuse Collection Point	200 days	Tue 4/5/21	Fri 31/12/21	18%	163.17 days						
398	General Excavation with ELS to Formation	15 days	Tue 4/5/21	Fri 21/5/21	100%	0 days						
399	Substructure Construction	20 days	Sat 22/5/21	Tue 15/6/21	100%	0 days						
400	Superstructure Construction	45 days	Wed 16/6/21	Sat 7/8/21	90%	4.5 days						
401	Pavement / Footpath reinstatement	90 days	Mon 9/8/21	Wed 24/11/21	0%	90 days						
402	ABWF Works	120 days	Mon 9/8/21	Fri 31/12/21	0%	120 days						
403	E&M and Waterworks	120 days	Mon 9/8/21	Fri 31/12/21	0%	120 days						

Task Summary Progress Inactive Milestone Manual Task Manual Summary Rollup Start-only Manual Progress
 Milestone Critical Inactive Task Inactive Summary Duration-only Manual Summary Finish-only

**Three Months Rolling Programme of
Contract CV/2017/02**



ID	WBS	Task Name	Duration	Start Date	Completion Date	Qtr 4, 2019							Qtr	
						November			June		January			
						24/9	1/7	7/4	12/1	18/10	25/7	1/5		
354	14.3.5.14	Phase 5: TTA12s	45 days	Sat 15/6/19	Wed 7/8/19									
363	14.3.5.15	Phase 5: TTA19s	45 days	Sat 15/6/19	Wed 7/8/19									
372	14.3.5.16	Phase 6: TTA6s	46 days	Fri 9/8/19	Thu 3/10/19									
381	14.3.5.17	Phase 6: TTA13s	42 days	Wed 14/8/19	Thu 3/10/19									
390	14.3.5.18	Phase 6: TTA20s	47 days	Thu 8/8/19	Thu 3/10/19									
399	14.3.5.19	Phase 7: TTA7s	44 days	Tue 8/10/19	Wed 27/11/19									
408	14.3.5.20	Phase 7: TTA14s	46 days	Fri 4/10/19	Wed 27/11/19									
417	14.3.5.21	Phase 7: additional TTA21s	29 days	Thu 24/10/19	Wed 27/11/19									
427	14.3.5.22	additional Phase 8: additional TTA 0s	41 days	Wed 27/11/19	Fri 17/1/20									
437	14.3.6	Construction of Sewerage (DN630) - refer to Drawing No. MKTR Programme/DR/001	311 days	Sat 18/1/20	Wed 3/2/21									
438	14.3.6.1	Phase A: TTA 1n	50 days	Tue 21/1/20	Sat 21/3/20									
447	14.3.6.2	Phase A: TTA 7n	52 days	Sat 18/1/20	Sat 21/3/20									
456	14.3.6.3	Phase B: TTA 2n	52 days	Mon 23/3/20	Thu 28/5/20									
465	14.3.6.4	Phase B: TTA 8n	52 days	Mon 23/3/20	Thu 28/5/20									
474	14.3.6.5	Phase C: TTA 3n	52 days	Fri 29/5/20	Thu 30/7/20									
483	14.3.6.6	Phase C: TTA 9n	52 days	Fri 29/5/20	Thu 30/7/20									
492	14.3.6.7	Phase D: TTA 4n	52 days	Fri 31/7/20	Tue 29/9/20									
501	14.3.6.8	Phase D: TTA 10n	52 days	Fri 31/7/20	Tue 29/9/20									
510	14.3.6.9	Phase E: TTA 5n	52 days	Wed 30/9/20	Wed 2/12/20									
519	14.3.6.10	Phase E: TTA 11n	52 days	Wed 30/9/20	Wed 2/12/20									
528	14.3.6.11	Phase F: TTA 6n	51 days	Thu 3/12/20	Wed 3/2/21									
537	14.3.6.12	Phase F: additional TTA 12s	38 days	Fri 18/12/20	Wed 3/2/21									
546	14.3.6.13	Phase F: additional TTA 0n	38 days	Fri 18/12/20	Wed 3/2/21									
555	15	Planned Completion for section 1 of the works	0 days	Wed 3/2/21	Wed 3/2/21									
556	16	Completion Date for section 1 of the works	0 days	Wed 3/2/21	Wed 3/2/21									
557	17	section 2 of the works - Completion of all works within Parts C1 and C2 of the Site except Establishment works	979 days	Thu 31/5/18	Wed 3/2/21									
558	17.1	access date for section 2 (Part C1)	0 days	Thu 31/5/18	Thu 31/5/18									
559	17.2	Temporary Traffic Arrangement (TTA) Scheme for Lin Ma Hang Road	162 days	Fri 1/6/18	Fri 9/11/18									
565	17.3	works at Lin Ma Hang Road (section 2 Part C1) refer Appendice LMHR01a to d	817 days	Sat 10/11/18	Wed 3/2/21									
566	17.3.1	Phase I (stage 1)-south lane (chainage 240-283)	23 days	Sat 10/11/18	Thu 6/12/18									
577	17.3.2	Phase I (stage 2)-north lane (chainage 240-283)	16 days	Fri 7/12/18	Thu 27/12/18									
587	17.3.3	Phase I (stage 3)-south lane (chainage 283-335)	26 days	Fri 28/12/18	Mon 28/1/19									
598	17.3.4	Phase I (stage 4)-north lane (chainage 283-335)	17 days	Tue 29/1/19	Wed 20/2/19									
608	17.3.5	Phase I (stage 5)-south lane (chainage 335-380)	18 days	Thu 21/2/19	Wed 13/3/19									
618	17.3.6	Phase I (stage 6)-north lane (chainage 335-380)	16 days	Thu 14/3/19	Mon 1/4/19									
627	17.3.7	Phase I (stage 7)-south lane (chainage 380-435)	23 days	Tue 2/4/19	Fri 3/5/19									
638	17.3.8	Phase I (stage 8)-north lane (chainage 380-435)	15 days	Sat 4/5/19	Wed 22/5/19									
648	17.3.9	Phase I (stage 9)-south lane (chainage 190-240)	18 days	Thu 23/5/19	Thu 13/6/19									
659	17.3.10	Phase I (stage 10)-north lane (chainage 190-240)	16 days	Fri 14/6/19	Wed 3/7/19									
669	17.3.11	Phase II (stage 1)-south lane (chainage 32-85)-Noise Barrier MM6 (bays 1-3) & MM7 (bays 1-2)	95 days	Thu 4/7/19	Fri 25/10/19									
703	17.3.12	Phase II (stage 2)-north lane (chainage 32-85)-Noise Barrier MM9 (bays 1-4)	84 days	Sat 26/10/19	Fri 7/2/20									
735	17.3.13	Phase II (stage 3)-south lane (chainage 85-138)	38 days	Sat 8/2/20	Mon 23/3/20									
746	17.3.14	Phase II (stage 4)-north lane (chainage 85-138)-Noise Barrier MM10 (bays 1-4)	68 days	Tue 24/3/20	Wed 17/6/20									
776	17.3.15	Phase II (stage 5)-south lane (chainage 138-190)	36 days	Thu 18/6/20	Fri 31/7/20									
787	17.3.16	Phase II (stage 6)-north lane (chainage 138-190)-Noise Barrier MM10 (bays 5-9)	85 days	Sat 1/8/20	Wed 11/11/20									
818	17.3.17	Phase II (stage 7)-south lane (chainage 0-32)-Noise Barrier MM5 (bays 1-2)	53 days	Thu 12/11/20	Fri 15/1/21									
851	17.3.18	Phase II (stage 8)-north lane (chainage 0-32)	16 days	Sat 16/1/21	Wed 3/2/21									
862	17.3.19	Noise Barrier MM8 (bays 1-3)	140 days	Sat 1/8/20	Mon 18/1/21									

Appendix D

Monitoring Locations

Air Quality Monitoring Location

Printed by : 2/26/2016
 Filename : G:\env\project\21448\13_Drawing_Deliverables\Reports\018_EIA&A_Manual\20160226_Revise_Final\Figure 5.12 - Locations of Construction Dust Monitoring (Sheet 2 of 4).dgn



- Legend**
- Project Boundary
 - Utilities Construction
 - Proposed Air Monitoring Stations

E	FIFTH ISSUE	GL	02/16
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Rev	Description	By	Date

Consultant

Contract No. and Title:
 Agreement No. CE 1/2013(CE)
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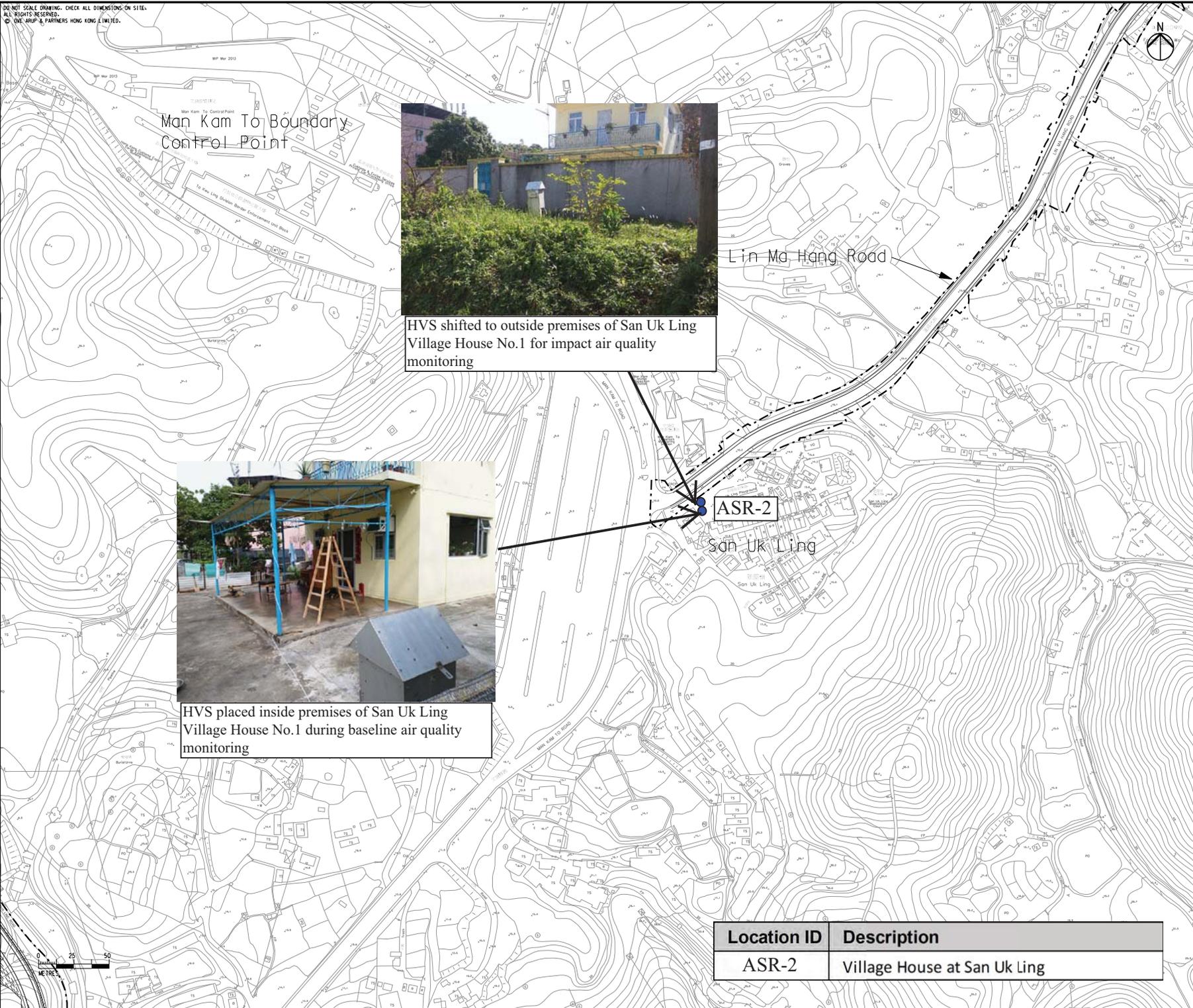
Drawing title

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Location ID	Description
ASR-1	Village House along Man Kam To Road

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Man Kam To Boundary Control Point



HVS shifted to outside premises of San Uk Ling Village House No.1 for impact air quality monitoring



HVS placed inside premises of San Uk Ling Village House No.1 during baseline air quality monitoring

Lin Ma Hang Road

ASR-2

San Uk Ling

Location ID	Description
ASR-2	Village House at San Uk Ling

- Legend
- Project Boundary
 - Existing Air Monitoring Stations

Rev	Description	By	Date
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C	THIRD ISSUE	GL	10/15
B	SECOND ISSUE	GL	02/15

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Drawing title
Figure 1
 Air Quality Monitoring Location (ASR-2)

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- Legend**
- Project Boundary
 - Existing Air Monitoring Station
 - Proposed Air Monitoring Station



Location ASR-3 at Muk Wu Nga Yiu House No. 28 during baseline monitoring



Proposed Location ASR-3a at Muk Wu Nga Yiu House No. 2A for impact monitoring

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Drawing title
Figure 2
 Air Quality Monitoring Location (ASR-3)

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Location ID	Description
ASR-3	Village House at Muk Wu Nga Yiu

Noise Monitoring Location

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- Legend**
- Project Boundary
 - Utilities Construction
 - 300m Assessment Area
 - Proposed Construction Noise Monitoring Locations

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D	FOURTH ISSUE	GL	12/15
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Rev	Description	By	Date

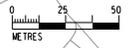
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Drawing title

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Location ID	Description
CN-1	Village house to the west of Sha Ling Road

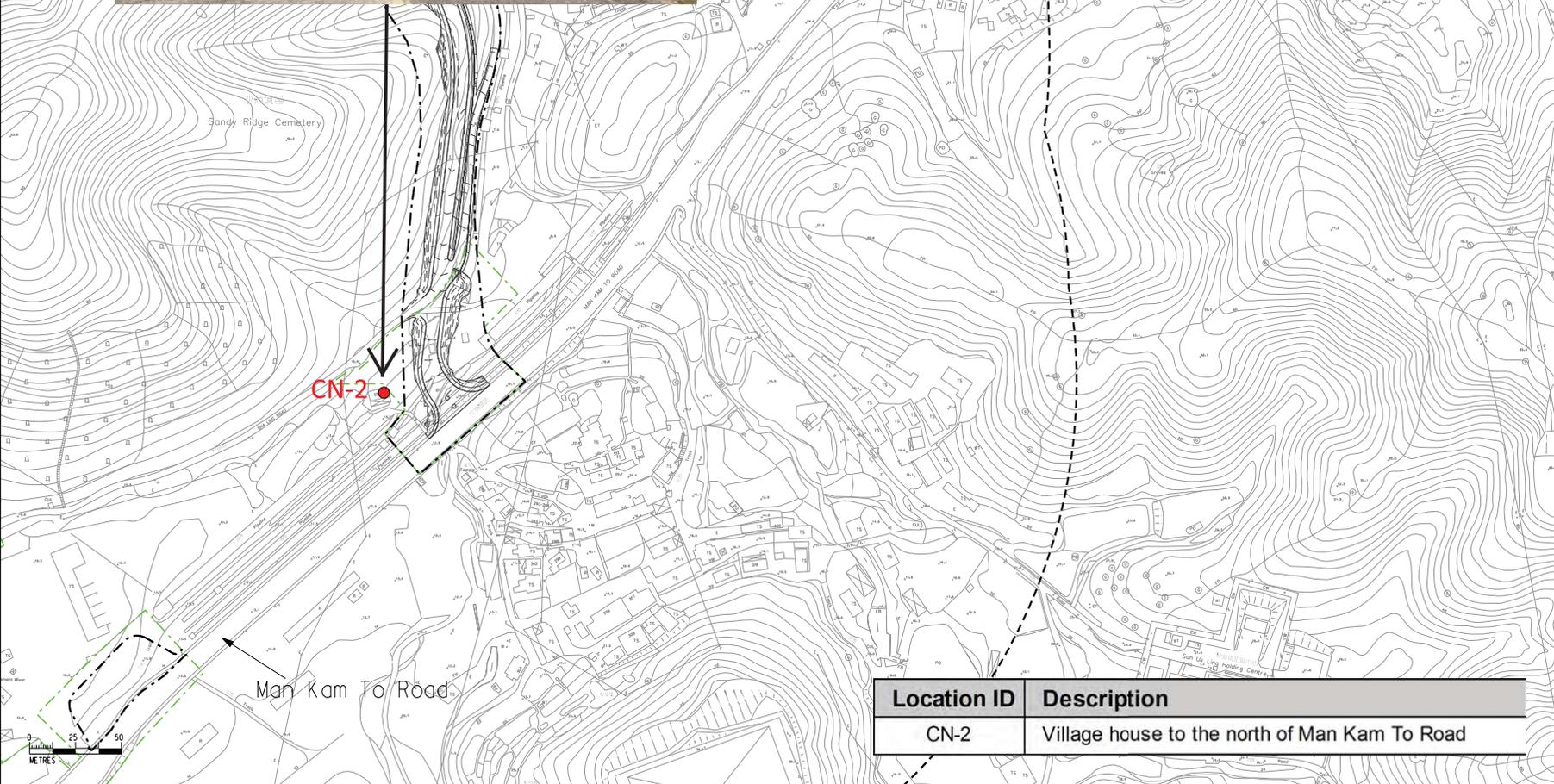


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 File name : G:\env\proj\ec\1\231448\13_Drawing_Deliverables\Reports\018_EWA Manual\20160226_Revise_Final_v1\Figure_6.2.3 - Locations of Proposed Construction Noise Monitoring (Sheet_3 of 4).dgn

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2018/4/6



- Legend**
- Project Boundary
 - Utilities Construction
 - 300m Assessment Area
 - Proposed Construction Noise Monitoring Locations

Rev	Description	By	Date
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Drawing title

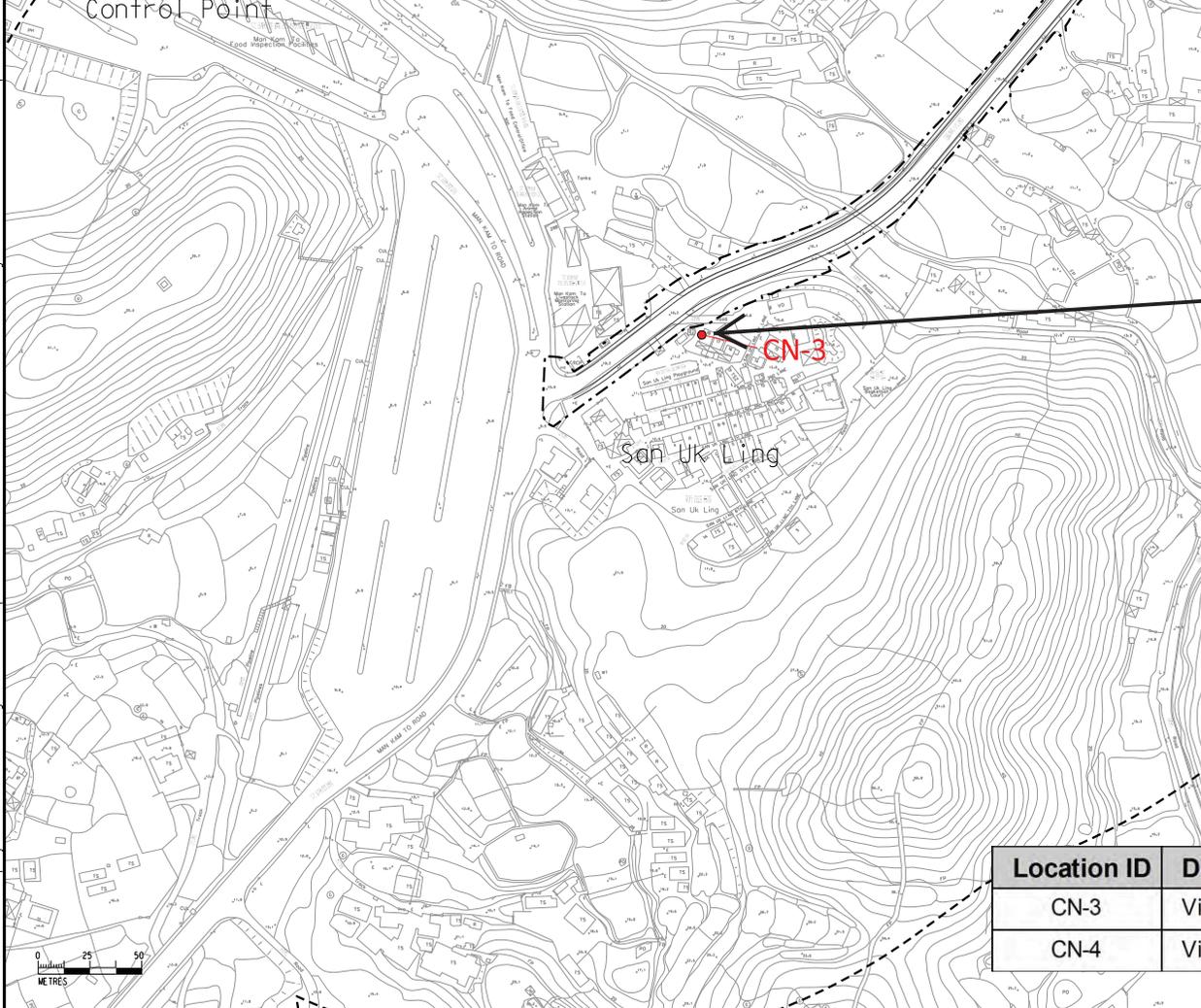
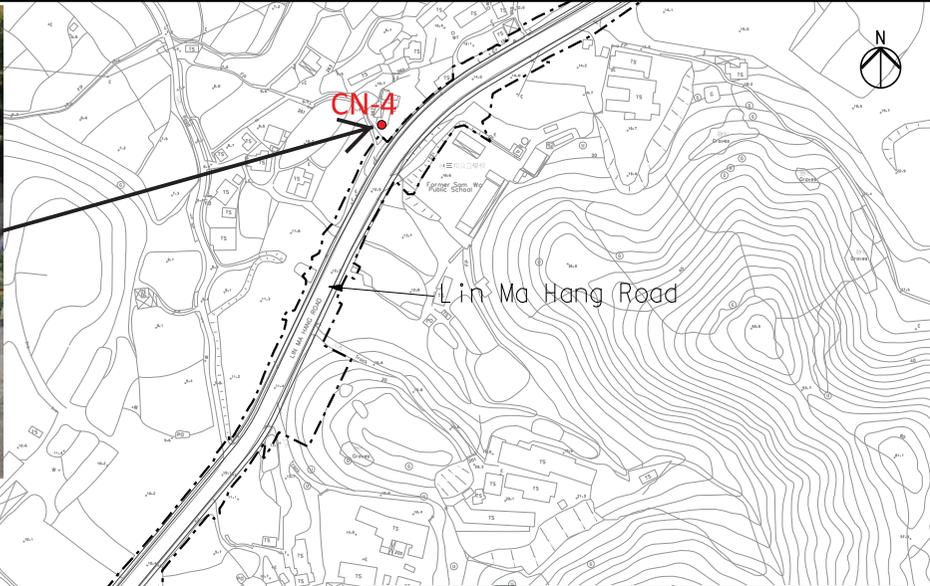
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Location ID	Description
CN-2	Village house to the north of Man Kam To Road

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Man Kam To
Boundary
Control Point



San Uk Ling

CN-3

CN-4

Lin Ma Hang Road



- Legend**
- Project Boundary
 - 300m Assessment Area
 - Proposed Construction Noise Monitoring Locations

E	FIFTH ISSUE	GL	02/16
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Drawing title

Location ID	Description
CN-3	Village house near San Uk Ling
CN-4	Village house of Muk Wu

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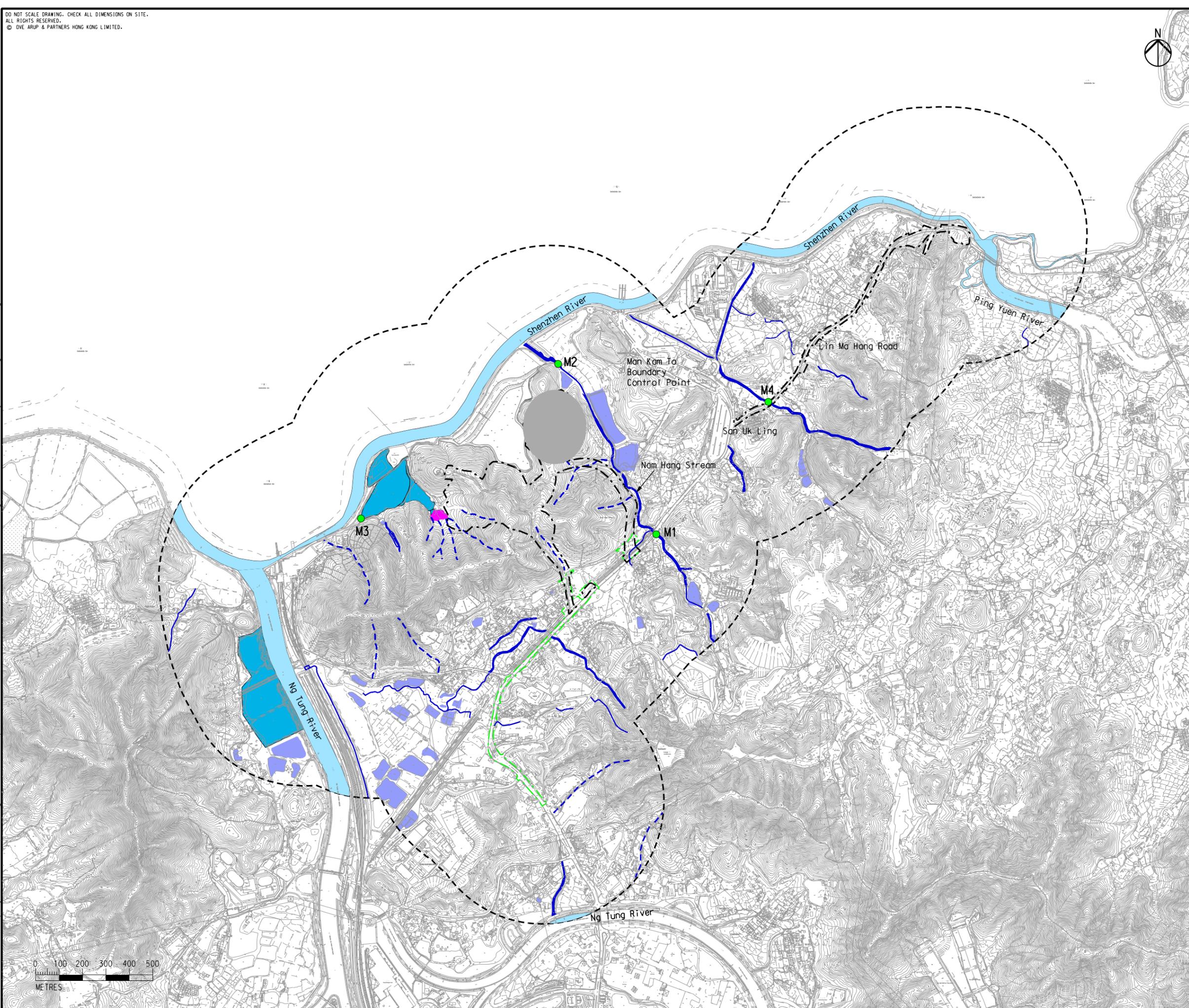
Water Quality Monitoring Station



Legend

- Project Boundary
- Utilities Construction
- 500m Assessment Area
- Channelized River
- Pond
- Watercourse
- Conservation Area (CA)
- Wet Woodland
- Seasonal Watercourse
- Baseline Monitoring Station

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Drawing title
**Water Quality Monitoring
 Locations**

Drawing no. Figure 7.1.1		Rev. E	
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 Civil Engineering and
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Appendix E

**Calibration Certificate of Monitoring Equipment and
Laboratory Certificate**

CALIBRATION CERTIFICATES FOR MONITORING EQUIPMENT USED IN THE REPORTING MONTH

Items	Aspect	Description of Equipment	Date of Calibration	Date of Next Calibration
1a	Air	TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for ASR-1	20 May 22	3 Jun 22
1b		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for ASR-1	6 Jun 22	20 Jun 22
1c		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for ASR-1	20 Jun 22	4 Jul 22
2		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for ASR-2	20 May 22	3 Jun 22
2a		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for ASR-2	6 Jun 22	20 Jun 22
2c		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for ASR-2	20 Jun 22	4 Jul 22
3		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for ASR-3a	20 May 22	3 Jun 22
3a		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for ASR-3a	6 Jun 22	20 Jun 22
3c		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for ASR-3a	20 Jun 22	4 Jul 22
4		Calibration Kit TISCH Model TE-5025A Orifice ID 1612 and Rootmeter S/N 438320	27 Dec 21	27 Dec 22
5		Laser Dust Monitor, Model AM510 (Serial No. 11008060) – EQ101	4 Feb 22	4 Feb 23
6		Laser Dust Monitor, Model AM510 (Serial No. 11008017) – EQ102	4 Feb 22	4 Feb 23
7	Laser Dust Monitor, Model LD-3B (Serial No. 2X6145) – EQ105	15 Jan 22	15 Jan 23	
8	Noise	Rion NL- 52 Sound Level Meter (Serial No. 00921191) – EQ013	10 Sep 21	10 Sep 22
9		Rion NL- 52 Sound Level Meter (Serial No. 00142581) – EQ015	9 Nov 21	9 Nov 22
10		Rion NC - 74 Acoustical Calibrator (Serial No. 34657230) – EQ086	10 Sep 21	10 Sep 22
11	Water	YSI Professional DSS (Serial No.20J101862/15H103928)	26 Apr 22	26 Jul 22
12		Global Water FP211 Flow Meter (Serial No. 1449006330)	1 Sep 21	1 Sep 22

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Sha Ling Village House No.6	Date of Calibration: 20-May-22
Location ID : ASR-1	Next Calibration Date: 3-Jun-22
Name and Model: TISCH HVS Model TE-5170	Technician: Leung Ka Wai

CONDITIONS

Sea Level Pressure (hPa)	1009.2	Corrected Pressure (mm Hg)	756.9
Temperature (°C)	26.9	Temperature (K)	300

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	1.999838
Model->	5025A	Qstd Intercept ->	-0.00903
Serial # ->	1612		

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.90	5.90	11.8	1.713	54	53.55	Slope = 33.7859 Intercept = -5.4283 Corr. coeff. = 0.9967
13	4.90	4.90	9.8	1.562	47	46.61	
10	3.50	3.50	7.0	1.321	39	38.67	
7	2.40	2.40	4.8	1.094	31	30.74	
5	1.50	1.50	3.0	0.866	25	24.79	

Calculations :

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

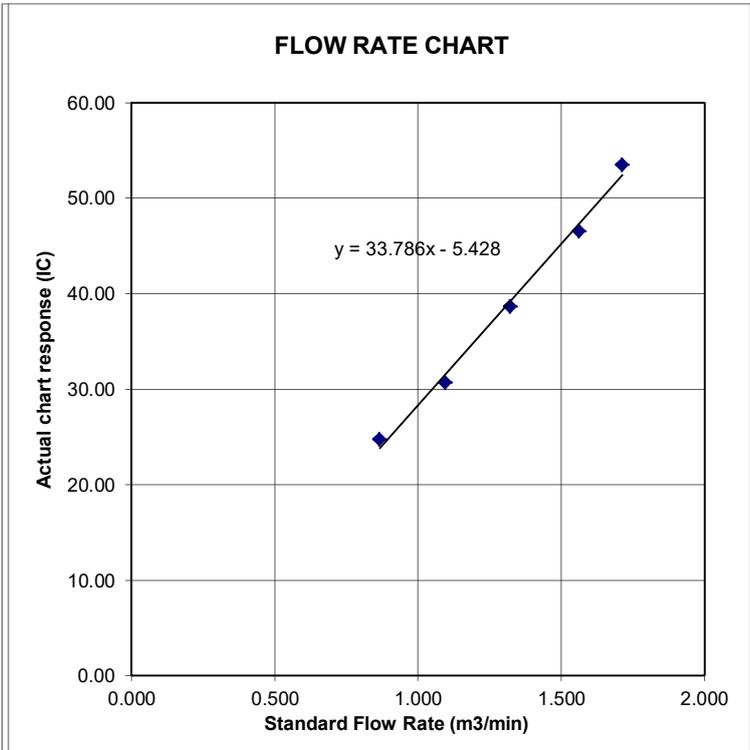
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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

For subsequent calculation of sampler flow:

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

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



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : San Uk Ling Village House No.1	Date of Calibration: 20-May-22
Location ID : ASR-2	Next Calibration Date: 3-Jun-22
Name and Model: TISCH HVS Model TE-5170	Technician: Leung Ka Wai

CONDITIONS

Sea Level Pressure (hPa)	1009.2	Corrected Pressure (mm Hg)	756.9
Temperature (°C)	26.9	Temperature (K)	300

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	1.999838
Model->	5025A	Qstd Intercept ->	-0.00903
Serial # ->	1612		

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.10	6.10	12.2	1.742	54	53.55	Slope = 32.1739 Intercept = -3.4130 Corr. coeff. = 0.9976
13	4.70	4.70	9.4	1.530	45	44.62	
10	3.60	3.60	7.2	1.339	40	39.67	
7	2.40	2.40	4.8	1.094	32	31.73	
5	1.50	1.50	3.0	0.866	25	24.79	

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

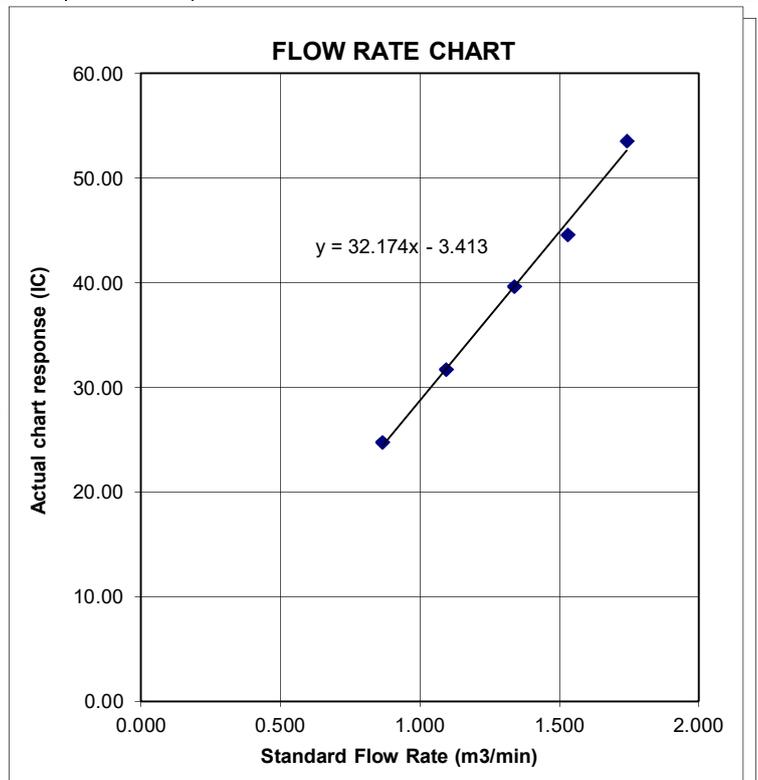
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Muk Wu Nga Yiu House No.2A	Date of Calibration: 20-May-22
Location ID : ASR-3a	Next Calibration Date: 3-Jun-22
Name and Model: TISCH HVS Model TE-5170	Technician: Leung Ka Wai

CONDITIONS

Sea Level Pressure (hPa) 1009.2	Corrected Pressure (mm Hg) 756.9
Temperature (°C) 26.9	Temperature (K) 300

CALIBRATION ORIFICE

Make-> TISCH	Qstd Slope -> 1.999838
Model-> 5025A	Qstd Intercept -> -0.00903
Serial # -> 1612	

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION		
							Slope =	Intercept =	Corr. coeff. =
18	6.00	6.00	12.0	1.728	56	55.53	Slope = 34.1978 Intercept = -4.4149 Corr. coeff. = 0.9983		
13	4.60	4.60	9.2	1.513	47	46.61			
10	3.40	3.40	6.8	1.302	40	39.67			
7	2.40	2.40	4.8	1.094	33	32.72			
5	1.40	1.40	2.8	0.837	25	24.79			

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

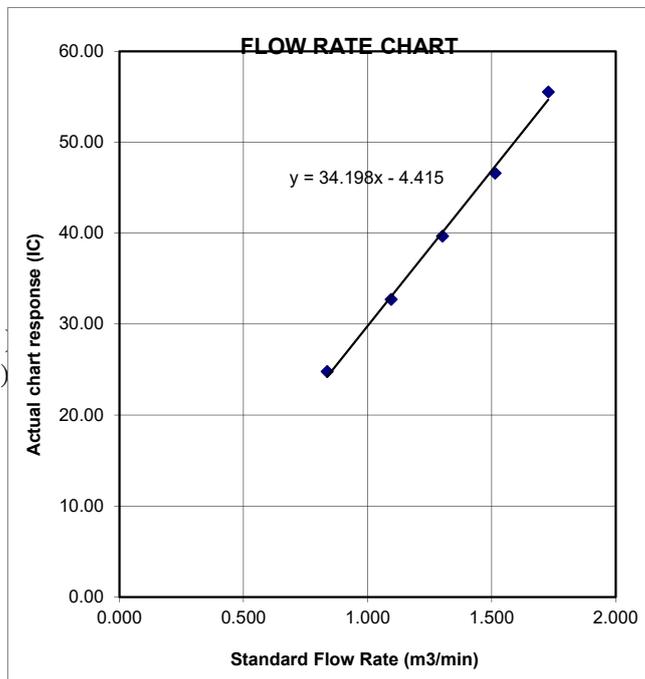
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Sha Ling Village House No.6	Date of Calibration: 6-Jun-22
Location ID : ASR-1	Next Calibration Date: 20-Jun-22
Name and Model: TISCH HVS Model TE-5170	Technician: Leung Ka Wai

CONDITIONS

Sea Level Pressure (hPa)	1003.6	Corrected Pressure (mm Hg)	752.7
Temperature (°C)	28.9	Temperature (K)	302

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	1.999838
Model->	5025A	Qstd Intercept ->	-0.00903
Serial # ->	1612		

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.00	6.00	12.0	1.717	54	53.05	Slope = 33.2580 Intercept = -4.8620 Corr. coeff. = 0.9979
13	4.90	4.90	9.8	1.552	47	46.17	
10	3.60	3.60	7.2	1.331	40	39.29	
7	2.40	2.40	4.8	1.088	31	30.45	
5	1.40	1.40	2.8	0.832	24	23.58	

Calculations :

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

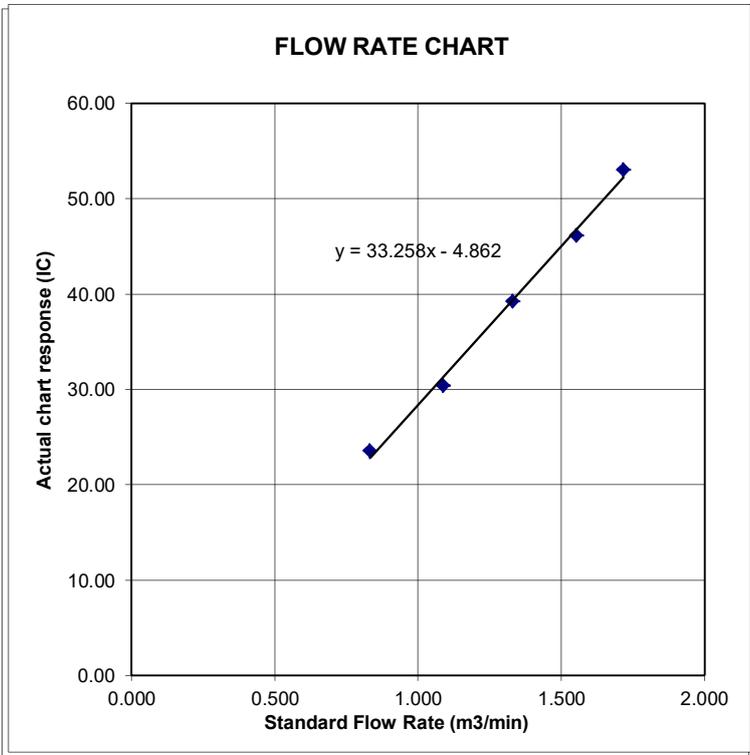
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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

For subsequent calculation of sampler flow:

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

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



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : San Uk Ling Village House No.1	Date of Calibration: 6-Jun-22
Location ID : ASR-2	Next Calibration Date: 20-Jun-22
Name and Model: TISCH HVS Model TE-5170	Technician: Leung Ka Wai

CONDITIONS

Sea Level Pressure (hPa)	1003.6	Corrected Pressure (mm Hg)	752.7
Temperature (°C)	28.9	Temperature (K)	302

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	1.999838
Model->	5025A	Qstd Intercept ->	-0.00903
Serial # ->	1612		

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.10	6.10	12.2	1.731	55	54.03	Slope = 32.8003 Intercept = -4.0836 Corr. coeff. = 0.9952
13	4.60	4.60	9.2	1.504	45	44.20	
10	3.60	3.60	7.2	1.331	39	38.31	
7	2.30	2.30	4.6	1.065	32	31.43	
5	1.50	1.50	3.0	0.861	25	24.56	

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

m = sampler slope

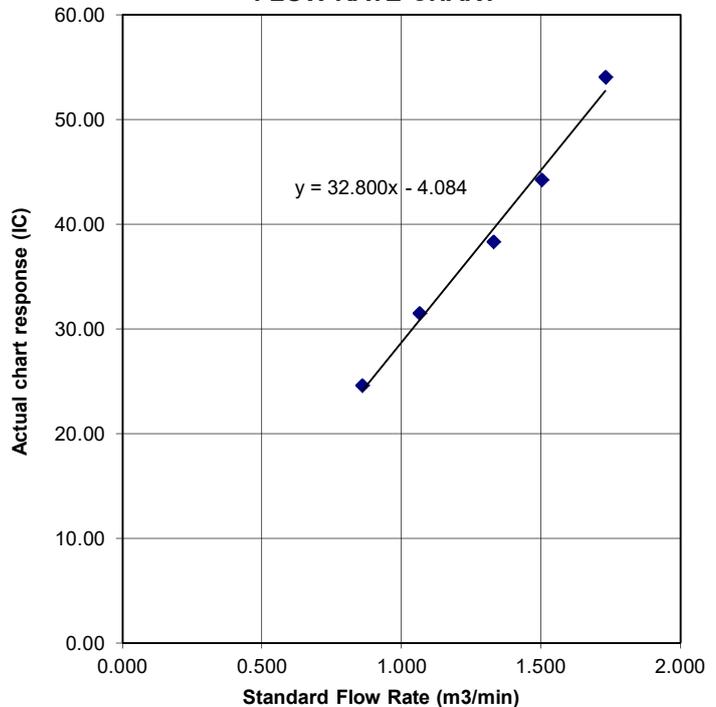
b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

FLOW RATE CHART



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Muk Wu Nga Yiu House No.2A	Date of Calibration: 6-Jun-22
Location ID : ASR-3a	Next Calibration Date: 20-Jun-22
Name and Model: TISCH HVS Model TE-5170	Technician: Leung Ka Wai

CONDITIONS

Sea Level Pressure (hPa) 1003.6	Corrected Pressure (mm Hg) 752.7
Temperature (°C) 28.9	Temperature (K) 302

CALIBRATION ORIFICE

Make-> TISCH	Qstd Slope -> 1.999838
Model-> 5025A	Qstd Intercept -> -0.00903
Serial # -> 1612	

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
							Slope = 33.6911
18	6.00	6.00	12.0	1.717	56	55.01	Intercept = -4.0981
13	4.70	4.70	9.4	1.520	47	46.17	Corr. coeff. = 0.9969
10	3.50	3.50	7.0	1.313	40	39.29	
7	2.40	2.40	4.8	1.088	33	32.42	
5	1.30	1.30	2.6	0.802	24	23.58	

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H20(Pa/Pstd)(Tstd/Ta))-b]$$

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

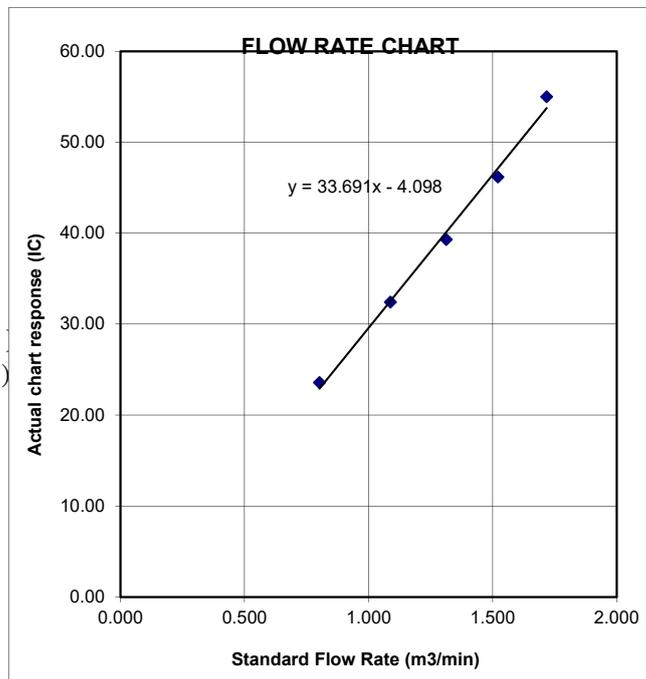
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Sha Ling Village House No.6	Date of Calibration: 20-Jun-22
Location ID : ASR-1	Next Calibration Date: 4-Jul-22
Name and Model: TISCH HVS Model TE-5170	Technician: Leung Ka Wai

CONDITIONS

Sea Level Pressure (hPa)	1004.8	Corrected Pressure (mm Hg)	753.6
Temperature (°C)	29.2	Temperature (K)	302

CALIBRATION ORIFICE

Make-> TISCH	Qstd Slope ->
Model-> 5025A	1.999838
Serial # -> 1612	Qstd Intercept ->
	-0.00903

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.50	5.50	11.0	1.644	52	51.06	Slope = 28.9940 Intercept = 2.7654 Corr. coeff. = 0.9985
13	4.30	4.30	8.6	1.455	45	44.19	
10	3.20	3.20	6.4	1.255	40	39.28	
7	1.90	1.90	3.8	0.968	31	30.44	
5	1.20	1.20	2.4	0.771	26	25.53	

Calculations :

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

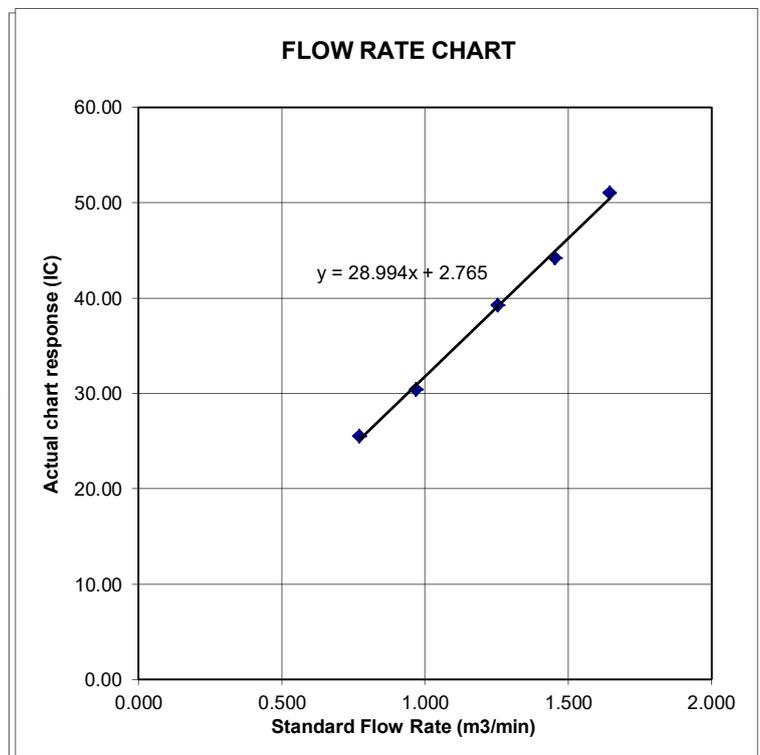
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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

For subsequent calculation of sampler flow:

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

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



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : San Uk Ling Village House No.1	Date of Calibration: 20-Jun-22
Location ID : ASR-2	Next Calibration Date: 4-Jul-22
Name and Model: TISCH HVS Model TE-5170	Technician: Leung Ka Wai

CONDITIONS

Sea Level Pressure (hPa)	1004.8	Corrected Pressure (mm Hg)	753.6
Temperature (°C)	29.2	Temperature (K)	302

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	1.999838
Model->	5025A	Qstd Intercept ->	-0.00903
Serial # ->	1612		

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.60	5.60	11.2	1.659	53	52.04	Slope = 32.4988 Intercept = -2.5105 Corr. coeff. = 0.9960
13	4.30	4.30	8.6	1.455	46	45.17	
10	3.50	3.50	7.0	1.313	40	39.28	
7	2.50	2.50	5.0	1.110	33	32.40	
5	1.30	1.30	2.6	0.802	25	24.55	

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

m = sampler slope

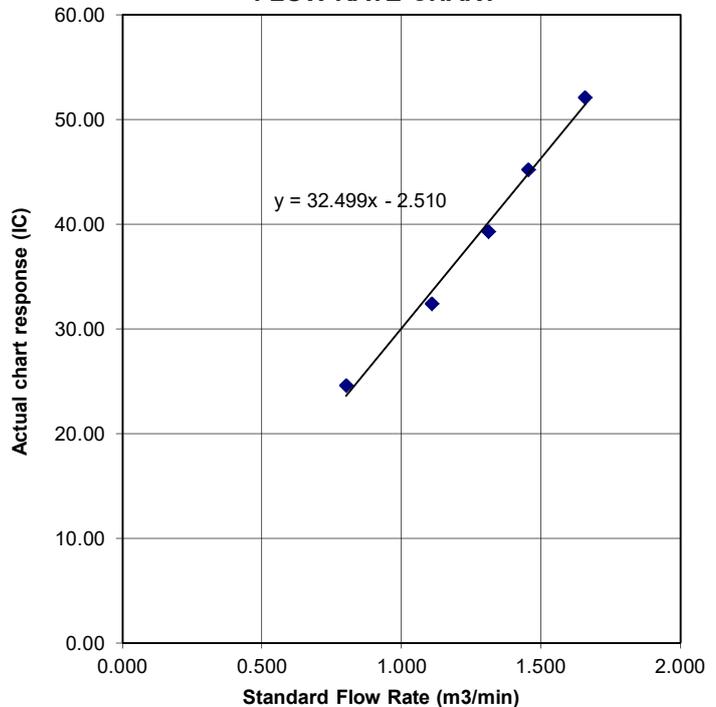
b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

FLOW RATE CHART



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Muk Wu Nga Yiu House No.2A	Date of Calibration: 20-Jun-22
Location ID : ASR-3a	Next Calibration Date: 4-Jul-22
Name and Model: TISCH HVS Model TE-5170	Technician: Leung Ka Wai

CONDITIONS

Sea Level Pressure (hPa)	1004.8	Corrected Pressure (mm Hg)	753.6
Temperature (°C)	29.2	Temperature (K)	302

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	1.999838
Model->	5025A	Qstd Intercept ->	-0.00903
Serial # ->	1612		

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION		
							Slope =	Intercept =	Corr. coeff. =
18	5.40	5.40	10.8	1.629	53	52.04	Slope = 30.6873 Intercept = 1.0465 Corr. coeff. = 0.9965		
13	4.30	4.30	8.6	1.455	46	45.17			
10	3.20	3.20	6.4	1.255	40	39.28			
7	2.40	2.40	4.8	1.088	34	33.39			
5	1.10	1.10	2.2	0.738	25	24.55			

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

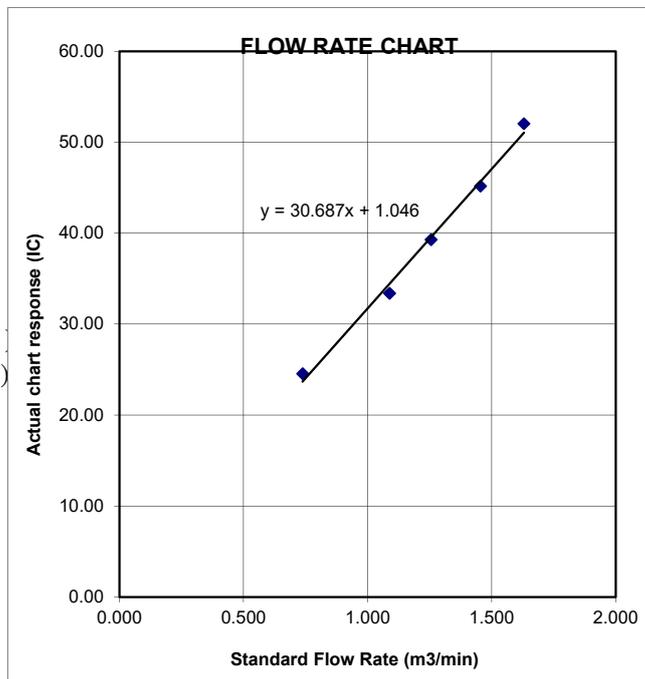
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





Certificate of Calibration

Calibration Certification Information			
Cal. Date: December 27, 2021	Rootsmeter S/N: 438320	Ta: 295	°K
Operator: Jim Tisch		Pa: 740.4	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: 1612		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3890	3.2	2.00
2	3	4	1	0.9760	6.4	4.00
3	5	6	1	0.8740	7.9	5.00
4	7	8	1	0.8320	8.8	5.50
5	9	10	1	0.6870	12.7	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)}$ (y-axis)
0.9799	0.7055	1.4029	0.9957	0.7168	0.8927
0.9756	0.9996	1.9841	0.9914	1.0157	1.2624
0.9736	1.1140	2.2183	0.9893	1.1320	1.4114
0.9724	1.1688	2.3265	0.9881	1.1876	1.4803
0.9673	1.4079	2.8059	0.9828	1.4306	1.7853
QSTD	m=	1.99838	QA	m=	1.25135
	b=	-0.00903		b=	-0.00574
	r=	0.99999		r=	0.99999

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

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

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

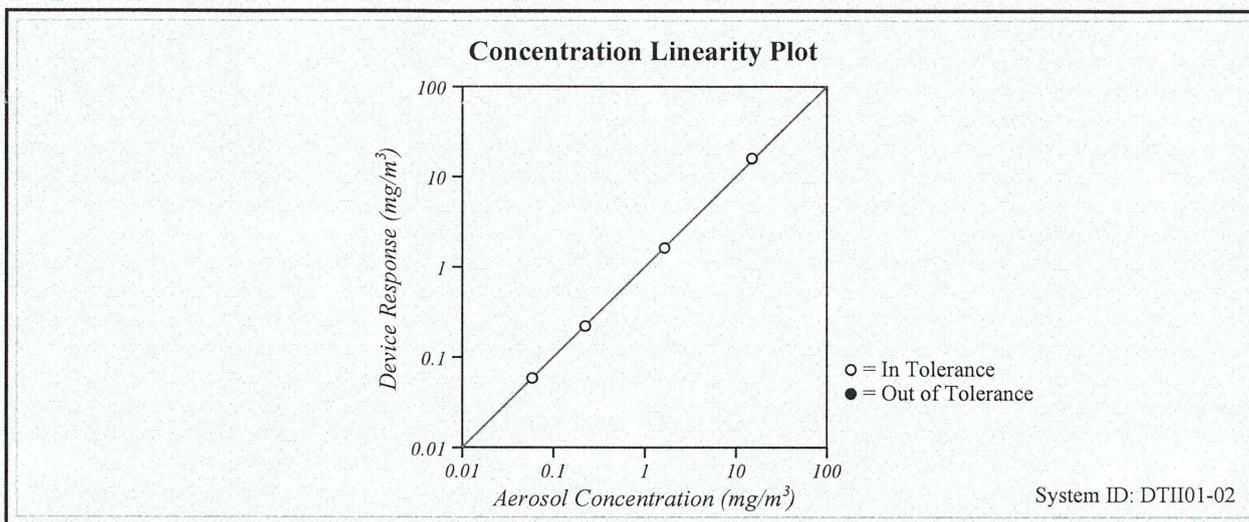


CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
 Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

Environment Conditions			Model	AM510
Temperature	76.23 (24.6)	°F (°C)		
Relative Humidity	19.5	%RH	Serial Number	11008060
Barometric Pressure	29.30 (992.2)	inHg (hPa)		

<input checked="" type="checkbox"/> As Left	<input checked="" type="checkbox"/> In Tolerance	
<input type="checkbox"/> As Found	<input type="checkbox"/> Out of Tolerance	



CONCENTRATION				Unit: mg/m ³			
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	1.631	1.529	1.468~1.794	3	0.058	0.055	0.041~0.075
2	0.221	0.207	0.188~0.254	4	14.840	14.955	13.356~16.324

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 4:1

Measurement Variable	System ID	Last Cal.	Cal. Due		Measurement Variable	System ID	Last Cal.	Cal. Due
DC Voltage	E003314	01-11-22	01-31-23		Photometer	E003319	08-30-21	02-28-22
Microbalance	M001324	01-29-21	01-31-23		Pressure	E003511	10-26-21	10-31-22
Flowmeter	E005626	03-09-21	03-31-22		DC Voltage	E003315	01-11-22	01-31-23

 _____ Calibrated	February 4, 2022 _____ Date
-------------------------	-----------------------------------

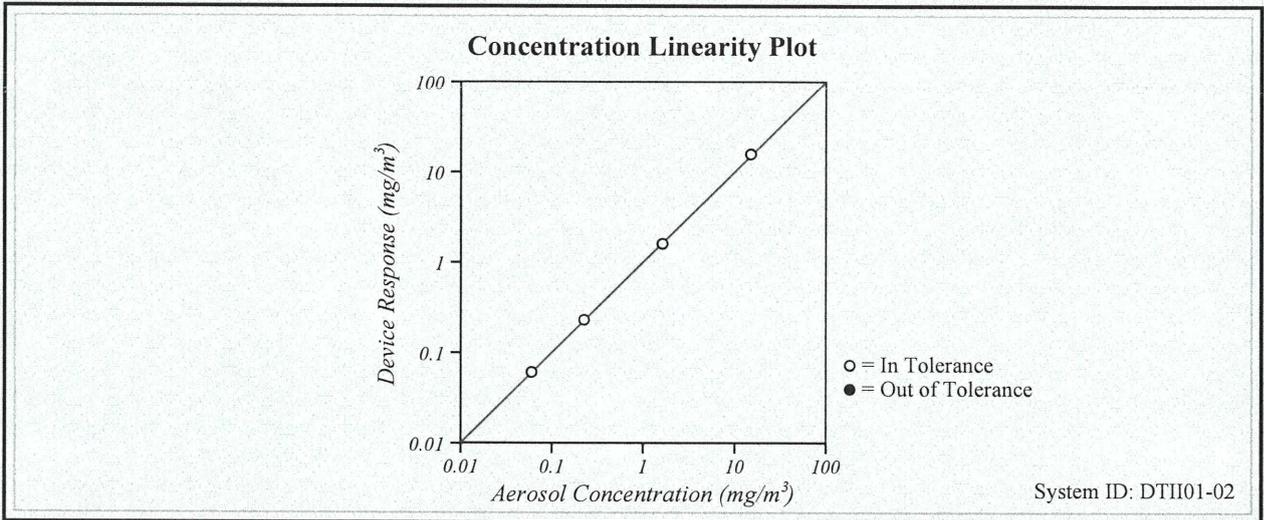


CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
 Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

Environment Conditions			Model	AM510
Temperature	76.22 (24.6)	°F (°C)	Serial Number	11008017
Relative Humidity	21.7	%RH		
Barometric Pressure	29.32 (992.9)	inHg (hPa)		

<input checked="" type="checkbox"/> As Left	<input checked="" type="checkbox"/> In Tolerance	
<input type="checkbox"/> As Found	<input type="checkbox"/> Out of Tolerance	



CONCENTRATION				Unit: mg/m ³			
#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	1.609	1.505	1.448~1.770	3	0.059	0.057	0.041~0.077
2	0.223	0.216	0.190~0.256	4	14.848	14.816	13.363~16.333

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 4:1

Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
DC Voltage	E003314	01-11-22	01-31-23	Photometer	E003319	08-30-21	02-28-22
Microbalance	M001324	01-29-21	01-31-23	Pressure	E003511	10-26-21	10-31-22
Flowmeter	E005626	03-09-21	03-31-22	DC Voltage	E003315	01-11-22	01-31-23

 _____ Calibrated	February 4, 2022 _____ Date
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ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	: HK2210522
CLIENT	: ACTION-UNITED ENVIRONMENTAL SERVICES & CONSULTING		
ADDRESS	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T.	SUB-BATCH	: 1
		DATE RECEIVED	: 18-MAR-2022
		DATE OF ISSUE	: 28-MAR-2022
PROJECT	: ----	NO. OF SAMPLES	: 1
		CLIENT ORDER	: ----

General Comments

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

Signatories

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

Signatories

Position

Richard Fung

Managing Director

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

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

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

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

WORK ORDER : HK2210522
SUB-BATCH : 1
CLIENT : ACTION-UNITED ENVIRONMENTAL SERVICES & CONSULTING
PROJECT : ----



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK2210522-001	S/N: 2X6145	AIR	18-Mar-2022	S/N: 2X6145

Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
 Manufacturer: Sibata LD-3B
 Serial No. 2X6145
 Equipment Ref: EQ105

Standard Equipment:

Standard Equipment: Higher Volume Sampler (TSP)
 Location & Location ID: AUES office (calibration room)
 Equipment Ref: HVS 018 & HVS 019
 Last Calibration Date: 5 November 2021 & 13 December 2021

Equipment Verification Results:

Verification Date: 20 December 2021 & 7 January 2022

Date	Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in ug/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/min)
7 Jan 22	2hr	11:55 ~ 13:55	18.6	1021.6	55.1	2445	20.4
7 Jan 22	2hr27mins	14:23 ~ 16:50	18.6	1021.6	54.8	2316	15.8
7 Jan 22	2hr09mins	16:50 ~ 18:59	18.6	1021.6	56.5	2504	19.4
20 Dec 21*	45mins	10:15 ~ 11:00	20.5	1008.7	472.0	9410	209.1
20 Dec 21*	31mins	11:05 ~ 11:36	20.5	1008.7	187.2	3955	129.2

(* Suspended particle was added into calibration room of HVS019 for high concentration test.

Sensitivity Adjustment Scale Setting (Before Calibration) 586 (CPM)

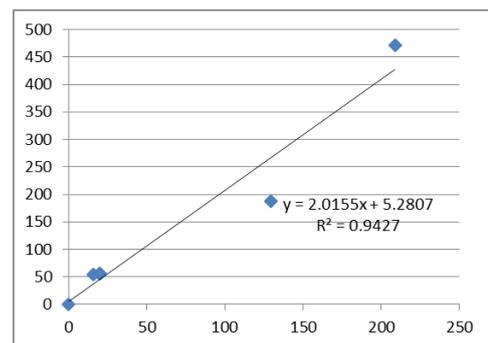
Sensitivity Adjustment Scale Setting (After Calibration) 586 (CPM)

Linear Regression of Y or X

Slope (K-factor): 2.0155 (ug/m³)/CPM

Correlation Coefficient (R) 0.9709

Date of Issue 15 January 2022



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 2.0155 (ug/m³)/CPM should be apply for TSP monitoring

*If R<0.5, repair or re-verification is required for the equipment

Operator : Fai So Signature : [Signature] Date : 15 January 2022

QC Reviewer : Ben Tam Signature : [Signature] Date : 15 January 2022

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration: 5-Nov-21
Location ID :	Calibration Room	Next Calibration Date: 5-Feb-22

CONDITIONS

Sea Level Pressure (hPa)	1012.5	Corrected Pressure (mm Hg)	759.375
Temperature (°C)	25.6	Temperature (K)	299

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10574
Model->	5025A	Qstd Intercept ->	-0.00985
Calibration Date->	19-Jan-21	Expiry Date->	18-Jan-22

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.2	6.2	12.4	1.675	52	51.93	Slope = 24.2092 Intercept = 10.8881 Corr. coeff. = 0.9959
13	5	5	10.0	1.504	48	47.93	
10	3.9	3.9	7.8	1.329	42	41.94	
8	2.5	2.5	5.0	1.065	36	35.95	
5	1.0	1.0	2.0	0.675	28	27.96	

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H20(Pa/Pstd)(Tstd/Ta))-b]$$

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

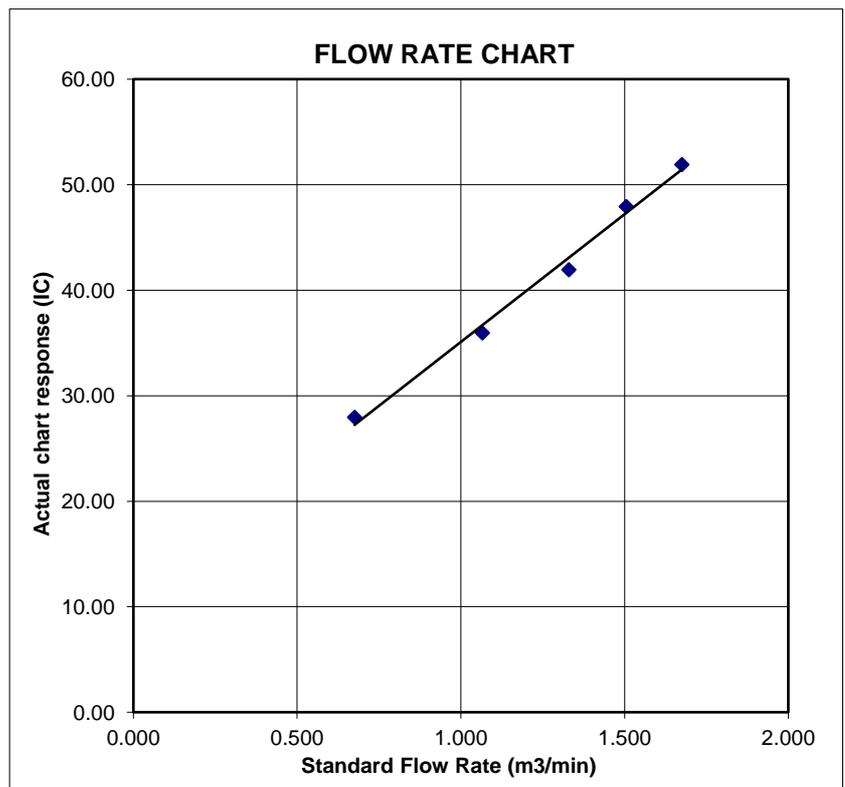
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Gold King Industrial Building, Kwai Chung Date of Calibration: 13-Dec-21
 Location ID : Calibration Room Next Calibration Date: 13-Mar-22

CONDITIONS

Sea Level Pressure (hPa)	1014.3	Corrected Pressure (mm Hg)	760.725
Temperature (°C)	24.0	Temperature (K)	297

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.10574
Model->	5025A	Qstd Intercept ->	-0.00985
Calibration Date->	19-Jan-21	Expiry Date->	18-Jan-22

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.2	6.2	12.4	1.681	52	52.11	Slope = 36.4525 Intercept = -9.0200 Corr. coeff. = 0.9943
13	4.9	4.9	9.8	1.495	44	44.10	
10	3.7	3.7	7.4	1.299	40	40.09	
8	2.4	2.4	4.8	1.047	30	30.06	
5	1.5	1.5	3.0	0.829	20	20.04	

Calculations :

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

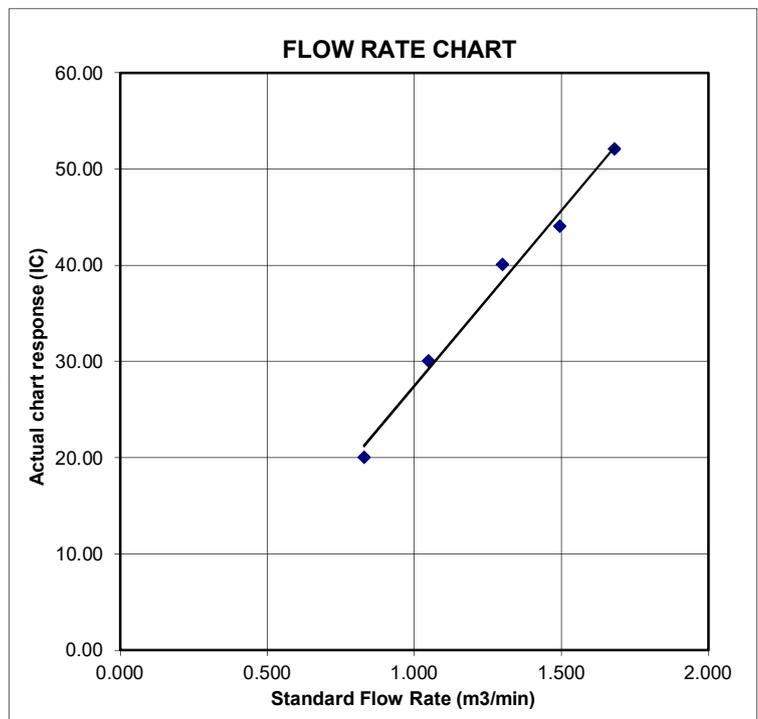
$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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

For subsequent calculation of sampler flow:

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

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





Certificate of Calibration

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

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

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

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

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

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



輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C215420
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC21-1765) Date of Receipt / 收件日期 : 26 August 2021

Description / 儀器名稱 : Sound Level Meter (EQ013)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 00921191
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 10 September 2021

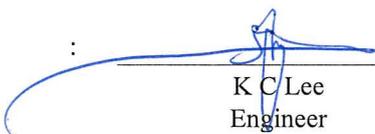
TEST RESULTS / 測試結果

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

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

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

Tested By : 
測試 : _____
K P Cheuk
Project Engineer

Certified By : 
核證 : _____
K C Lee
Engineer

Date of Issue : 13 September 2021
簽發日期

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

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

Sun Creation Engineering Limited – Calibration & Testing Laboratory

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

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號四樓

Tel/電話: (852) 2927 2606

Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

Certificate of Calibration

校正證書

Certificate No. : C215420

證書編號

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

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C210084
CL281	Multifunction Acoustic Calibrator	AV210017

5. Test procedure : MA101N.

6. Results :

- 6.1 Sound Pressure Level

- 6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	94.2	± 1.1

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L _A	A	Fast	94.00	1	94.2 (Ref.)
				104.00		104.2
				114.00		114.1

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

- 6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	94.2	Ref.
			Slow				

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

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

Certificate of Calibration

校正證書

Certificate No. : C215420

證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _A	A	Fast	94.00	63 Hz	67.9	-26.2 ± 1.5
					125 Hz	78.0	-16.1 ± 1.5
					250 Hz	85.5	-8.6 ± 1.4
					500 Hz	91.0	-3.2 ± 1.4
					1 kHz	94.2	Ref.
					2 kHz	95.4	+1.2 ± 1.6
					4 kHz	95.2	+1.0 ± 1.6
					8 kHz	93.2	-1.1 (+2.1 ; -3.1)
					16 kHz	86.2	-6.6 (+3.5 ; -17.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _C	C	Fast	94.00	63 Hz	93.3	-0.8 ± 1.5
					125 Hz	94.0	-0.2 ± 1.5
					250 Hz	94.2	0.0 ± 1.4
					500 Hz	94.2	0.0 ± 1.4
					1 kHz	94.2	Ref.
					2 kHz	94.0	-0.2 ± 1.6
					4 kHz	93.4	-0.8 ± 1.6
					8 kHz	91.3	-3.0 (+2.1 ; -3.1)
					16 kHz	84.3	-8.5 (+3.5 ; -17.0)

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

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



Certificate of Calibration

校正證書

Certificate No. : C215420
證書編號

- Remarks : - UUT Microphone Model No. : UC-59 & S/N : 12910
- Mfr's Spec. : IEC 61672 Class 1
- Uncertainties of Applied Value :
- | | | |
|--------|------------------|--------------------------|
| 94 dB | : 63 Hz - 125 Hz | : ± 0.35 dB |
| | 250 Hz - 500 Hz | : ± 0.30 dB |
| | 1 kHz | : ± 0.20 dB |
| | 2 kHz - 4 kHz | : ± 0.35 dB |
| | 8 kHz | : ± 0.45 dB |
| | 16 kHz | : ± 0.70 dB |
| 104 dB | : 1 kHz | : ± 0.10 dB (Ref. 94 dB) |
| 114 dB | : 1 kHz | : ± 0.10 dB (Ref. 94 dB) |
- The uncertainties are for a confidence probability of not less than 95 %.

Note :

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

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

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

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

Certificate of Calibration

校正證書

Certificate No. : C216480

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC21-2189) Date of Receipt / 收件日期 : 25 October 2021

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

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration

DATE OF TEST / 測試日期 : 9 November 2021

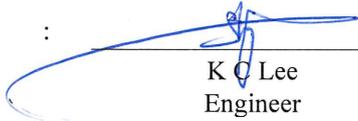
TEST RESULTS / 測試結果

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

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

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

Tested By : 
測試 : _____
K P Cheuk
Project Engineer

Certified By : 
核證 : _____
K C Lee
Engineer

Date of Issue : 10 November 2021
簽發日期

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

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

Certificate of Calibration

校正證書

Certificate No. : C216480

證書編號

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

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL280	40 MHz Arbitrary Waveform Generator	C210084
CL281	Multifunction Acoustic Calibrator	AV210017

- Test procedure : MA101N.

- Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Adjustment

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L _A	A	Fast	94.00	1	* 96.3	± 1.1

* Out of IEC 61672 Class 1 Spec.

6.1.1.2 After Adjustment

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

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L _A	A	Fast	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.0

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

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

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

Certificate of Calibration

校正證書

Certificate No. : C216480

證書編號

6.2 Time Weighting

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

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _A	A	Fast	94.00	63 Hz	67.8	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.5
					250 Hz	85.4	-8.6 ± 1.4
					500 Hz	90.8	-3.2 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	95.3	+1.2 ± 1.6
					4 kHz	95.1	+1.0 ± 1.6
					8 kHz	93.0	-1.1 (+2.1 ; -3.1)
					16 kHz	86.1	-6.6 (+3.5 ; -17.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _C	C	Fast	94.00	63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.9	-0.2 ± 1.5
					250 Hz	94.0	0.0 ± 1.4
					500 Hz	94.1	0.0 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	93.9	-0.2 ± 1.6
					4 kHz	93.3	-0.8 ± 1.6
					8 kHz	91.1	-3.0 (+2.1 ; -3.1)
					16 kHz	84.2	-8.5 (+3.5 ; -17.0)

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輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C216480

證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 20044

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

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

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

Note :

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

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

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

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Sun Creation Engineering Limited – Calibration & Testing Laboratory

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

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號四樓

Tel/電話: (852) 2927 2606

Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com



Certificate of Calibration

校正證書

Certificate No. : C215419
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC21-1345) Date of Receipt / 收件日期 : 26 August 2021
Description / 儀器名稱 : Sound Calibrator (EQ086)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NC-74
Serial No. / 編號 : 34657230
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 10 September 2021

TEST RESULTS / 測試結果

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

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

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

Tested By : 
測試 : _____
K P Cheuk
Project Engineer

Certified By : 
核證 : _____
K C Lee
Engineer

Date of Issue : 13 September 2021
簽發日期

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

Certificate of Calibration

校正證書

Certificate No. : C215419
證書編號

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

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C213954
CL281	Multifunction Acoustic Calibrator	AV210017
TST150A	Measuring Amplifier	C201309

- Test procedure : MA100N.

- Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.1	± 0.3	± 0.2

5.2 Frequency Accuracy

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

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

Note :

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

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

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

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



REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	WORK ORDER:	HK2214108
CLIENT:	ACTION-UNITED ENVIRONMENTAL SERVICES & CONSULTING		
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T.	SUB-BATCH:	0
		LABORATORY:	HONG KONG
		DATE RECEIVED:	21-Apr-2022
		DATE OF ISSUE:	26-Apr-2022

SPECIFIC COMMENTS

Equipment information (Brand name, Model No., Serial No. and Equipment No.) is provided by client. The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principle as practised by the laboratory or quoted from relevant international standards.

The validity of equipment/ meter performance only applies to the result(s) stated in the report.

Equipment Type:	Multifunctional Meter
Service Nature:	Performance Check
Scope:	Conductivity, Dissolved Oxygen, pH Value, Turbidity, Salinity and Temperature
Brand Name/ Model No.:	[YSI]/ [Professional DSS]
Serial No./ Equipment No.:	[20J101862/ 15H103928]/ [EQW018]
Date of Calibration:	26-April-2022

GENERAL COMMENTS

This report superseded any previous report(s) with same work order number.

Ms. Lin Wai Yu, Iris
Assistant Manager - Inorganics

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION



WORK ORDER: HK2214108
SUB-BATCH: 0
DATE OF ISSUE: 26-Apr-2022
CLIENT: ACTION-UNITED ENVIRONMENTAL SERVICES & CONSULTING

Equipment Type: Multifunctional Meter
Brand Name/ Model No.: [YSI]/ [Professional DSS]
Serial No./ Equipment No.: [20J101862/ 15H103928]/ [EQW018]
Date of Calibration: 26-April-2022 **Date of Next Calibration:** 26-July-2022

PARAMETERS:

Conductivity Method Ref: APHA (21st edition), 2510B

Expected Reading (µS/cm)	Displayed Reading (µS/cm)	Tolerance (%)
146.9	153.1	+4.2
6667	6431	-3.5
12890	12657	-1.8
58670	56091	-4.4
	Tolerance Limit (%)	±10.0

Dissolved Oxygen Method Ref: APHA (21st edition), 4500O: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.30	3.47	+0.17
5.56	5.67	+0.11
8.18	8.20	+0.02
	Tolerance Limit (mg/L)	±0.20

pH Value Method Ref: APHA (21st edition), 4500H: B

Expected Reading (pH unit)	Displayed Reading (pH unit)	Tolerance (pH unit)
4.0	3.83	-0.17
7.0	7.08	+0.08
10.0	9.97	-0.03
	Tolerance Limit (pH unit)	±0.20

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Ms. Lin Wai Yu, Iris
 Assistant Manager - Inorganics

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION



WORK ORDER: HK2214108
SUB-BATCH: 0
DATE OF ISSUE: 26-Apr-2022
CLIENT: ACTION-UNITED ENVIRONMENTAL SERVICES & CONSULTING

Equipment Type: Multifunctional Meter
Brand Name/ Model No.: [YSI]/ [Professional DSS]
Serial No./ Equipment No.: [20J101862/ 15H103928]/ [EQW018]
Date of Calibration: 26-April-2022 **Date of Next Calibration:** 26-July-2022

PARAMETERS:

Turbidity Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.00	--
4	4.13	+3.3
40	41.69	+4.2
80	76.20	-4.8
400	403.20	+0.8
800	764.91	-4.4
	Tolerance Limit (%)	±10.0

Salinity Method Ref: APHA (21st edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	10.03	+0.3
20	20.38	+1.9
30	30.29	+1.0
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Ms. Lin Wai Yu, Iris
 Assistant Manager - Inorganics

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION



WORK ORDER: HK2214108
SUB-BATCH: 0
DATE OF ISSUE: 26-Apr-2022
CLIENT: ACTION-UNITED ENVIRONMENTAL SERVICES & CONSULTING

Equipment Type: Multifunctional Meter
Brand Name/ Model No.: [YSI]/ [Professional DSS]
Serial No./ Equipment No.: [20]101862/ 15H103928]/ [EQW018]
Date of Calibration: 26-April-2022 Date of Next Calibration: 26-July-2022

PARAMETERS:

Temperature Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
7.5	8.2	+0.7
23.5	22.4	-1.1
38.0	36.5	-1.5
	Tolerance Limit (°C)	±2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

A handwritten signature in blue ink, appearing to read 'Iris'.

Ms. Lin Wai Yu, Iris
Assistant Manager - Inorganics



ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street, Kwai Chung
N.T., Hong Kong
T: +852 2610 1044 | F: +852 2610 2021

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT: MR BEN TAM
CLIENT: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
ADDRESS: RM A 20/F., GOLD KING IND BLDG,
NO. 35-41 TAI LIN PAI ROAD,
KWAI CHUNG, N.T. HONG KONG

WORK ORDER: HK2135790
SUB-BATCH: 0
LABORATORY: HONG KONG
DATE RECEIVED: 02-Sep-2021
DATE OF ISSUE: 10-Sep-2021

SPECIFIC COMMENTS

The calibration of flow rate performed by AUES staff on 02 September 2020.

Scope of Test: Flow rate
Equipment Type: Flow Meter
Brand Name: Global Water
Model No.: FP211
Serial No.: 1449006330
Equipment No.: --
Calibration Factor: 314
Date of Calibration: 01 September, 2021

GENERAL COMMENTS

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


Mr. Fung Lim Chee, Richard
Managing Director, Life Sciences
Hong Kong

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Page 1 of 2

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION



Work Order: HK2135790
Sub-batch: 0
Date of Issue: 10-Sep-2021
Client: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING

Reference Equipment:

Model: SonTek IQ Standard
Serial Number : IQ1217004

Equipment to be calibrated:

Equipment Type: Flow Meter
Brand Name: Global Water
Model No.: FP211
Serial No.: 1449006330
Equipment No.: --
Calibration Factor: 314

Date of Calibration: 01 September, 2021

Parameters: The calibration of flow meter is verified with standard flow meter on site by AUES Staff.

Flow rate

Trial	Reading of Reference Equipment (m/s) SonTek IQ Standard Serial No: IQ1217004	Reading of Equipment to be calibrated (m/s) Global Water FP211 Serial No. 1449006330
1	0.10	0.1
2	0.19	0.2
3	0.41	0.4
4	0.78	0.8
5	1.02	1.0
6	1.11	1.1


Mr. Fung Lim Chee, Richard
Managing Director, Life Sciences
Hong Kong



Hong Kong Accreditation Service
香港認可處

Certificate of Accreditation
認可證書

This is to certify that
特此證明

ALS TECHNICHEM (HK) PTY LIMITED

11/F, Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, New Territories, Hong Kong
香港新界葵涌永業街1-3號忠信針織中心11樓

*is accredited by the Hong Kong Accreditation Service (HKAS) to ISO/IEC 17025:2017
for performing specific laboratory activities as listed in the scope of accreditation within the test category of*
獲香港認可處根據ISO/IEC 17025:2017認可
進行載於認可範圍內下述測試類別中的指定實驗所活動

Environmental Testing
環境測試

*This accreditation to ISO/IEC 17025:2017 demonstrates technical competence for a defined scope and
the implementation of a management system relevant to laboratory operation
(see joint IAF-ILAC-ISO Communiqué).*
此項 ISO/IEC 17025:2017 的認可資格證明此實驗所具備指定範疇內所須的技術能力並
實施一套與實驗所運作相關的管理體系
(見國際認可論壇、國際實驗所認可合作組織及國際標準化組織的聯合公報)。

The common seal of HKAS is affixed hereto by the authority of the HKAS Executive
現經香港認可處執行機關授權在此蓋上香港認可處的印章

SHUM Wai-leung, Executive Administrator
執行幹事 沈偉良
Issue Date : 28 February 2020
簽發日期：二零二零年二月二十八日

Registration Number : **HOKLAS 066**
註冊號碼：



Date of First Registration : 15 September 1995
首次註冊日期：一九九五年九月十五日

Appendix F

Event and Action Plan of Air Quality, Noise and Water Quality

Event and Action Plan for air quality

Event	Action			
	ET	IEC	ER	Contractor
Action level exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method. 	<ol style="list-style-type: none"> 1. Notify Contractor 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action level exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
Limit level exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit level exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. 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.

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

Event and Action Plan for Construction Noise

Event	Action			
	ET	IEC	ER	Contractor
Action Level Exceedance	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	1. Review the analyzed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analyzed noise problem; 4. Ensure remedial measures are properly implemented	1. Submit noise mitigation proposals to IEC and ER; 2. Implement noise mitigation proposals
Limit Level Exceedance	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.	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.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analyzed 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.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Note:

ET – Environmental Team

IEC – Independent Environmental Checker

ER – Engineer's Representative

Event and Action Plan for Water Quality

Event	Action			
	ET	IEC	ER	Contractor
Action level exceedance for one sampling day	<ol style="list-style-type: none"> 1. Inform IEC, Contractor and ER; 2. Check monitoring data, all plant, equipment and Contractor's working methods; and 3. Discuss remedial measures with IEC and Contractor and ER. 	<ol style="list-style-type: none"> 1. Discuss with ET, ER and Contractor on the implemented mitigation measures; 2. Review proposals on remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with IEC, ET and Contractor on the implemented mitigation measures; 2. Make agreement on the remedial measures to be implemented; 3. Supervise the implementation of agreed remedial measures. 	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment; 5. Consider changes of working methods; 6. Discuss with ER, ET and IEC and purpose remedial measures to IEC and ER; and 7. Implement the agreed mitigation measures.
Action level exceedance for more than one consecutive sampling days	<ol style="list-style-type: none"> 1. Repeat in-situ measurement on next day of exceedance to confirm findings; 2. Inform IEC, contractor and ER; 3. Check monitoring data, all plant, equipment and Contractor's working methods; 4. Discuss remedial measures with IEC, contractor and ER 5. Ensure remedial measures are implemented 	<ol style="list-style-type: none"> 1. Discuss with ET, Contractor and ER on the implemented mitigation measures; 2. Review the proposed remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with ET, IEC and Contractor on the proposed mitigation measures; 2. Make agreement on the remedial measures to be implemented ; and 3. Discuss with ET, IEC and Contractor on the effectiveness of the implemented remedial measures. 	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Discuss with ET, IEC and ER and submit proposal of remedial measures to ER and IEC within 3 working days of notification; and 6. Implement the agreed mitigation measures.
Limit level exceedance for one sampling day	<ol style="list-style-type: none"> 1. Repeat measurement on next day of exceedance to confirm findings; 2. Inform IEC, contractor and ER; 3. Rectify unacceptable practice; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 6. Consider changes of working methods; 7. Discuss mitigation measures with IEC, ER and Contractor; and 8. Ensure the agreed remedial measures are implemented 	<ol style="list-style-type: none"> 1. Discuss with ET, Contractor and ER on the implemented mitigation measures; 2. Review the proposed remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with ET, IEC and Contractor on the implemented remedial measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the remedial measures to be implemented; and 4. Discuss with ET, IEC and Contractor on the effectiveness of the implemented remedial measures. 	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Discuss with ET, IEC and ER and submit proposal of additional mitigation measures to ER and IEC within 3 working days of notification; and 6. Implement the agreed remedial measures.
Limit level exceedance for more than one consecutive sampling days	<ol style="list-style-type: none"> 1. Inform IEC, contractor and ER; 2. Check monitoring data, all plant, equipment and Contractor's working methods; 3. Discuss mitigation measures with IEC, ER and Contractor; 4. Ensure mitigation measures are implemented; and 5. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days 	<ol style="list-style-type: none"> 1. Discuss with ET, Contractor and ER on the implemented mitigation measures; 2. Review the proposed remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with ET, IEC and Contractor on the implemented remedial measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the remedial measures to be implemented; 4. Discuss with ET and IEC on the effectiveness of the implemented mitigation measures; and 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level. 	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Discuss with ET, IEC and ER and submit proposal of additional mitigation measures to ER and IEC within 3 working days of notification; and 6. Implement the agreed remedial measures; and 7. As directed by the ER, to slow down or stop all or part of the construction activities until no exceedance of Limit level.

Note: ET – Environmental Team IEC – Independent Environmental Checker ER – Engineer's Representative
 Each step of actions required shall be implemented within 1 working day unless otherwise specified or agreed with EPD.

Appendix G

Monitoring Schedules of the Reporting Month and Coming Month

Impact Monitoring Schedule of Air Quality, Noise and Water Quality – June 2021

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

✓	Monitoring Day
	Sunday or Public Holiday

Impact Monitoring Schedule of Air Quality, Noise and Water Quality – July 2022

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

*The Water Quality Monitoring was cancelled due to adverse weather condition (Typhoon Signal No. 8 in force).

✓	Monitoring Day
	Sunday or Public Holiday

Appendix H

Monitoring Data

- **24-hour TSP Air Quality**
- **Noise**
- **Water Quality**

Air Quality (24-hour TSP)

24-Hour TSP Monitoring Data for ASR-1

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP (°C)	AVG AIR PRESS (hPa)	STANDARD FLOW RATE (m ³ /min)	AIR VOLUME (std m ³)	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED (g)	24-Hr TSP (µg/m ³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG					INITIAL	FINAL		
1-Jun-22	28303	25630.71	25654.71	1440.00	43	43	43.0	28.7	1007.1	1.42	2047	2.7545	2.8207	0.0662	32
7-Jun-22	28329	25654.71	25678.71	1440.00	36	38	37.0	27.4	1004.5	1.25	1799	2.7722	2.7893	0.0171	10
13-Jun-22	28376	25678.71	25702.71	1440.00	40	42	41.0	28.9	1006.4	1.37	1968	2.7778	2.8394	0.0616	31
18-Jun-22	28401	25702.71	25726.71	1440.00	40	42	41.0	28.8	1006.8	1.37	1969	2.7990	2.8622	0.0632	32
24-Jun-22	28417	25726.71	25750.71	1440.00	43	44	43.5	30	1008.6	1.39	1999	2.7920	2.8638	0.0718	36
29-Jun-22	28434	25750.71	25774.71	1440.00	43	44	43.5	30.2	1002.8	1.38	1992	2.7637	2.8558	0.0921	46

24-Hour TSP Monitoring Data for ASR-2

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP (°C)	AVG AIR PRESS (hPa)	STANDARD FLOW RATE (m ³ /min)	AIR VOLUME (std m ³)	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED (g)	24-Hr TSP (µg/m ³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG					INITIAL	FINAL		
1-Jun-22	28296	23045.36	23069.36	1440.00	42	43	42.5	28.7	1007.1	1.41	2037	2.7743	2.9035	0.1292	63
7-Jun-22	28330	23069.36	23093.36	1440.00	44	45	44.5	27.4	1004.5	1.47	2117	2.7383	2.8184	0.0801	38
13-Jun-22	28375	23093.36	23117.36	1440.00	42	43	42.5	28.9	1006.4	1.41	2027	2.7890	2.8946	0.1056	52
18-Jun-22	28383	23117.36	23141.36	1440.00	44	44	44.0	28.8	1006.8	1.45	2093	2.7875	2.9452	0.1577	75
24-Jun-22	28418	23141.36	23165.36	1440.00	40	41	40.5	30	1008.6	1.31	1886	2.8048	2.9480	0.1432	76
29-Jun-22	28433	23165.36	23189.36	1440.00	42	43	42.5	30.2	1002.8	1.37	1968	2.7741	2.8610	0.0869	44

24-Hour TSP Monitoring Data for ASR-3a

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP (°C)	AVG AIR PRESS (hPa)	STANDARD FLOW RATE (m ³ /min)	AIR VOLUME (std m ³)	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED (g)	24-Hr TSP (µg/m ³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG					INITIAL	FINAL		
1-Jun-22	28328	16813.11	16837.11	1440.00	36	36	36	28.7	1007.1	1.17	1688	2.7672	2.8095	0.0423	25
7-Jun-22	28336	16837.11	16861.11	1440.00	42	43	42.5	27.4	1004.5	1.37	1976	2.7514	2.7942	0.0428	25
13-Jun-22	28374	16861.11	16885.11	1440.00	41	42	41.5	28.9	1006.4	1.34	1931	2.7800	2.8163	0.0363	18
18-Jun-22	28382	16885.11	16909.11	1440.00	41	42	41.5	28.8	1006.8	1.34	1932	2.7834	2.8110	0.0276	14
24-Jun-22	28416	16909.11	16933.11	1440.00	39	39	39	30	1008.6	1.22	1761	2.7915	2.8260	0.0345	18
29-Jun-22	28437	16933.11	16957.11	1440.00	40	41	40.5	30.2	1002.8	1.27	1824	2.7660	2.7896	0.0236	13

Noise

Noise Measurement Results (dB(A)) of CN-1																					
Date	Start Time	1 st Leq _{5min}	L10	L90	2 nd Leq _{5min}	L10	L90	3 rd Leq _{5min}	L10	L90	4 th Leq _{5min}	L10	L90	5 th Leq _{5min}	L10	L90	6 th Leq _{5min}	L10	L90	Leq _{30min}	Façade Correction (*)
2-Jun-22	13:12	56.8	58.7	54.6	56.6	57.2	54.1	56.7	57.8	53.9	55.8	57.9	54.2	55.6	56.8	54.3	58	61.1	54.5	57	60
8-Jun-22	13:00	56.6	56.9	53.5	55.8	56.2	53.7	55.4	57.1	53.9	55.3	56.6	54.4	58.8	61.2	54.6	56.2	57.6	54.2	57	60
14-Jun-22	13:00	55.4	57	53.5	56.2	58	54	55.7	60	54	54.9	56.5	52.5	56.7	60	53	55.1	58.5	52.5	56	59
20-Jun-22	9:32	56.1	56.8	54.1	55.5	56.2	53.8	55.8	57.7	53.9	55.5	56.6	54.4	58.5	60.9	54.6	56.6	57.9	54.7	56	59
30-Jun-22	9:36	67.2	69.8	59	65.5	68.8	59.3	63.3	64.2	59.7	64.4	65.4	63.4	66.3	66.7	65.3	66.6	67	65.3	66	69

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

Noise Measurement Results (dB(A)) of CN-2																					
Date	Start Time	1 st Leq _{5min}	L10	L90	2 nd Leq _{5min}	L10	L90	3 rd Leq _{5min}	L10	L90	4 th Leq _{5min}	L10	L90	5 th Leq _{5min}	L10	L90	6 th Leq _{5min}	L10	L90	Leq _{30min}	Façade Correction (*)
2-Jun-22	13:48	59.8	62.8	56.1	58.7	61.7	56.3	59.9	63.1	55.8	58.6	60.8	54.7	58.5	61.7	54.4	61.1	62.9	54.7	60	63
8-Jun-22	13:36	59.9	63	56.2	58.8	61.7	56.1	59.7	63.3	55.3	58.6	60.6	54.7	58.8	61.7	54.4	61	62.8	54.4	60	63
14-Jun-22	13:47	58.8	63	55.5	57.6	62.5	53.5	58.4	63.5	54	59.2	63	53.5	58.7	62.5	52.5	55.6	61.5	51.5	58	61
20-Jun-22	10:09	59.9	64.2	56.6	58.6	61.7	56.2	59.7	63.2	55.7	58.8	60.7	54.9	58.5	61.6	54.5	60.8	62.8	54.6	59	62
30-Jun-22	10:10	58.6	59.1	51.2	56.6	58.6	51.4	56.7	59.1	52.2	57.7	61.2	51.6	58.8	61.1	52.6	56.3	57.8	54.1	58	61

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

Noise Measurement Results (dB(A)) of CN-3																					
Date	Start Time	1 st Leq _{5min}	L10	L90	2 nd Leq _{5min}	L10	L90	3 rd Leq _{5min}	L10	L90	4 th Leq _{5min}	L10	L90	5 th Leq _{5min}	L10	L90	6 th Leq _{5min}	L10	L90	Leq _{30min}	Façade Correction (*)
2-Jun-22	13:23	60.3	63.7	54.6	60.6	64.9	55.1	61	63.1	55.8	61.8	64.7	56.4	60.2	63.3	54.8	60.3	63.4	55.1	61	64
8-Jun-22	14:15	58.8	61.6	55.7	58.2	59.7	54.8	67.7	69.2	66	66.5	70	53.9	62.8	68.7	55.5	68.6	70.2	58	65	68
14-Jun-22	14:25	57.2	63	54.5	58.6	64	53.5	60.1	63.5	55	56.9	63.5	53.5	60.2	64	53	58.8	62.5	52.5	59	62
20-Jun-22	10:45	57.9	61.7	55.8	58.6	60.8	55.1	67.7	69.8	66.1	66.6	70.1	53.8	62.2	68.2	55.8	67.7	70.2	58.1	65	68
30-Jun-22	10:47	58.9	60.6	53.6	58.6	60.5	55.3	60.7	62.2	55.5	61.4	64.6	55.9	60.7	63.1	54.7	62.2	65.5	58.2	61	64

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

Noise Measurement Results (dB(A)) of CN-4																					
Date	Start Time	1 st Leq _{5min}	L10	L90	2 nd Leq _{5min}	L10	L90	3 rd Leq _{5min}	L10	L90	4 th Leq _{5min}	L10	L90	5 th Leq _{5min}	L10	L90	6 th Leq _{5min}	L10	L90	Leq _{30min}	Façade Correction (*)
2-Jun-22	13:58	62.7	65.5	60.1	64.9	68.4	59.9	64.4	67.1	60	63.5	65.6	61	64.2	66.6	60.7	64.9	67.4	61	64	64
8-Jun-22	14:56	62.2	64.6	53	66.9	70.1	57.7	65.5	69.6	57.1	60.2	61.5	57	60.3	62.2	57.3	62.6	63.4	56.8	64	64
14-Jun-22	15:08	61.6	65.5	57	63.2	65.5	55.5	66.8	68.5	56.5	57.9	63.5	54.5	60.3	65	56	58.8	64.5	54	63	63
20-Jun-22	11:21	62.8	64.6	52.7	67	69.9	58.1	66.7	69.9	57.2	60.8	61.9	57.7	60.6	62.2	57.6	62.6	63.8	56.2	64	64
30-Jun-22	11:24	61.8	64.2	56.9	61.2	62.7	56.6	64.8	68.1	59.7	64.7	67.8	57.6	58.7	61.7	54.7	57.7	58.8	54.6	55	55

Water Quality

Water Quality Impact Monitoring Result for M1

Date	1-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M1	9:30	0.16	25.4	25.4	<0.1	<0.1	6.85	6.84	88.8	88.7	4	4.0	7.70	7.7	0.06	0.06	6	5.5
			25.4		<0.1		6.83		88.5		3.9		7.70		0.06		5	

Date	4-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M1	9:30	0.14	26.1	26.1	<0.1	<0.1	7	6.98	90.9	90.6	2.71	2.7	7.71	7.7	0.03	0.03	6	5.5
			26.1		<0.1		6.95		90.3		2.69		7.71		0.03		5	

Date	6-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M1	9:30	0.14	25.8	25.8	<0.1	<0.1	6.94	6.92	91.6	91.3	1.84	1.9	7.89	7.9	0.03	0.03	5	5.0
			25.8		<0.1		6.9		91.0		1.93		7.89		0.03		5	

Date	8-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M1	9:30	0.16	24.4	24.4	<0.1	<0.1	7	7.00	89.0	89.0	2.9	3.0	7.45	7.5	0.06	0.06	6	5.5
			24.4		<0.1		6.99		89.0		3.1		7.45		0.06		5	

Date	10-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M1	9:30	0.15	24.1	24.1	<0.1	<0.1	7.03	7.03	89.1	89.0	9.61	9.6	7.39	7.4	0.03	0.03	15	15.0
			24.1		<0.1		7.02		88.9		9.52		7.39		0.03		15	

Date	13-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M1	9:30	0.16	25.3	25.3	<0.1	<0.1	7.02	7.02	88.8	88.7	3.95	4.0	7.56	7.6	0.06	0.06	5	5.0
			25.3		<0.1		7.01		88.6		3.97		7.56		0.06		5	

Date	15-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M1	9:20	0.15	24.4	24.4	<0.1	<0.1	7.2	7.19	90.0	90.0	14.6	14.7	7.56	7.6	0.03	0.03	12	12.0
			24.4		<0.1		7.18		89.9		14.7		7.56		0.03		12	

Date		17-Jun-22																
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M1	9:30	0.14	25.6	25.6	<0.1	<0.1	6.99	6.98	89.5	89.4	8.48	8.5	7.47	7.5	0.07	0.07	12	12.0
			25.6		<0.1		6.97		89.2		8.42		7.47		0.07		12	

Date		20-Jun-22																
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M1	9:30	0.14	25.5	25.5	<0.1	<0.1	6.94	6.93	91.1	90.9	3.38	3.4	7.55	7.6	0.06	0.06	6	4.0
			25.5		<0.1		6.92		90.7		3.42		7.55		0.06		2	

Date		22-Jun-22																
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M1	10:00	0.13	26.3	26.3	<0.1	<0.1	6.16	6.15	82.5	82.1	6.48	6.4	7.50	7.5	0.06	0.06	7	6.5
			26.3		<0.1		6.13		81.7		6.37		7.50		0.06		6	

Date		24-Jun-22																
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M1	9:30	0.13	27	27.0	<0.1	<0.1	6.3	6.31	81.3	81.4	5.65	5.7	8.12	8.1	0.06	0.06	5	5.5
			27		<0.1		6.32		81.5		5.68		8.12		0.06		6	

Date		27-Jun-22																
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M1	10:05	0.13	26.2	26.2	<0.1	<0.1	6.93	6.93	91.1	91.1	4.36	4.4	7.00	7.0	0.06	0.06	4	3.0
			26.2		<0.1		6.92		91.0		4.38		7.00		0.06		2	

Date		29-Jun-22																
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M1	9:30	0.14	25.1	25.1	<0.1	<0.1	6.85	6.85	89.4	89.4	6.42	6.3	6.96	7.0	0.05	0.05	7	6.5
			25.1		<0.1		6.84		89.3		6.16		6.96		0.05		6	

	Limit Level exceedance
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Water Quality Impact Monitoring Result for M2

Date	1-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	10:10	0.02	25.2	25.2	<0.1	<0.1	5.38	5.43	72.0	71.3	14.5	14.6	7.70	7.7	0.06	0.06	12	11.5
			25.2		<0.1		5.48		70.5		14.6		7.70		0.06		11	

Date	4-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	10:10	0.02	25.8	25.8	<0.1	<0.1	5.63	5.61	71.2	71.1	12.7	12.7	7.71	7.7	0.03	0.03	10	9.5
			25.8		<0.1		5.59		71.0		12.6		7.71		0.03		9	

Date	6-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	10:00	0.09	26.2	26.2	<0.1	<0.1	4.98	5.00	65.9	66.1	2.1	2.0	7.22	7.2	0.07	0.07	5	4.5
			26.2		<0.1		5.02		66.2		1.91		7.22		0.07		4	

Date	8-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	10:00	0.10	24.6	24.6	<0.1	<0.1	6.88	6.86	88.3	88.2	14.5	14.7	7.30	7.3	0.06	0.06	15	15.5
			24.6		<0.1		6.83		88.1		14.9		7.30		0.06		16	

Date	10-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	10:10	0.09	24.9	24.9	<0.1	<0.1	5.57	5.54	69.9	69.6	16.5	16.5	7.29	7.3	0.05	0.05	12	12.5
			24.9		<0.1		5.51		69.3		16.4		7.29		0.05		13	

Date	13-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	10:00	0.09	25.6	25.6	<0.1	<0.1	5.97	5.91	75.5	74.8	65.1	65.7	7.46	7.5	0.07	0.07	137	136.5
			25.6		<0.1		5.85		74.0		66.2		7.46		0.07		136	

Date	15-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	10:05	0.08	25.1	25.1	<0.1	<0.1	7.04	7.05	88.3	88.4	14.8	14.8	7.50	7.5	0.04	0.04	25	25.5
			25.1		<0.1		7.05		88.4		14.7		7.50		0.04		26	

Date	17-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	10:00	0.08	25.8	25.8	<0.1	<0.1	6.51	6.49	83.5	83.3	11.9	11.8	7.36	7.4	0.08	0.08	19	20.0
			25.8		<0.1		6.47		83.1		11.6		7.36		0.08		21	

Date	20-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	10:10	0.08	25.9	25.9	<0.1	<0.1	6.45	6.43	84.7	84.4	17.64	17.5	7.45	7.5	0.08	0.08	25	26.0
			25.9		<0.1		6.4		84.0		17.44		7.45		0.08		27	

Date	22-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	10:35	0.07	26.6	26.6	<0.1	<0.1	6.57	6.55	87.5	86.9	17.2	16.7	7.20	7.2	0.07	0.07	28	27.5
			26.6		<0.1		6.52		86.3		16.1		7.20		0.07		27	

Date	24-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	11:00																	

Date	27-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	11:18	0.20	25.8	25.8	<0.1	<0.1	7.24	7.22	88.9	88.6	8.5	8.5	7.62	7.6	0.09	0.09	8	8.0
			25.8		<0.1		7.19		88.3		8.51		7.62		0.09		8	

Date	29-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	10:15	0.21	25.8	25.8	<0.1	<0.1	7.03	7.01	86.4	86.1	10.5	10.6	7.42	7.4	0.09	0.09	8	8.0
			25.8		<0.1		6.98		85.8		10.6		7.42		0.09		8	

Limit Level exceedance

Water Quality Impact Monitoring Result for M3

Date	1-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	10:20	2.45	26	26.0	<0.1	<0.1	6.88	6.87	89.3	89.2	5.4	5.4	7.40	7.4	0.01	0.01	5	5.5
			26		<0.1		6.86		89.0		5.3		7.40		0.01		6	

Date	4-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	10:25	2.45	26.6	26.6	<0.1	<0.1	6.76	6.75	87.9	87.7	4.04	4.0	7.51	7.5	0.02	0.02	3	3.0
			26.6		<0.1		6.73		87.5		4.03		7.51		0.02		3	

Date	6-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	10:15	2.45	26	26.0	<0.1	<0.1	6.28	6.37	83.4	84.7	4.2	4.2	7.34	7.3	0.02	0.02	2	2.5
			26		<0.1		6.46		85.9		4.1		7.34		0.02		3	

Date	8-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	10:10	2.45	24.5	24.5	<0.1	<0.1	6.87	6.84	89.3	89.0	2.61	2.7	7.41	7.4	0.01	0.01	2	2.0
			24.5		<0.1		6.81		88.7		2.73		7.43		0.01		2	

Date	10-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	10:20	2.45	25.1	25.1	<0.1	<0.1	7.04	7.03	89.7	89.5	5.3	5.3	7.37	7.4	0.01	0.01	6	6.0
			25.1		<0.1		7.01		89.3		5.2		7.37		0.01		6	

Date	13-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	10:10	2.45	25.8	25.8	<0.1	<0.1	6.62	6.59	83.7	83.4	5.51	5.5	7.42	7.4	0.02	0.02	8	7.5
			25.8		<0.1		6.55		83.0		5.46		7.42		0.02		7	

Date	15-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	10:15	2.45	24.7	24.7	<0.1	<0.1	6.75	6.75	84.6	84.6	5.69	5.5	7.44	7.4	0.01	0.01	7	6.5
			24.7		<0.1		6.74		84.5		5.34		7.44		0.01		6	

Date	17-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	10:15	2.45	25.8	25.8	<0.1	<0.1	6.25	6.20	80.1	79.3	3.48	3.5	7.31	7.3	0.02	0.02	6	6.0
			25.8		<0.1		6.14		78.4		3.49		7.31		0.02		6	

Date	20-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	10:20	2.45	26.1	26.1	<0.1	<0.1	6.9	6.89	90.9	90.7	1.74	1.7	7.49	7.5	0.01	0.01	3	2.5
			26.1		<0.1		6.87		90.5		1.73		7.49		0.01		2	

Date	22-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	10:45	2.45	26.5	26.5	<0.1	<0.1	6.58	6.62	88.1	88.5	2.91	3.1	7.30	7.3	0.02	0.02	5	4.5
			26.5		<0.1		6.66		88.9		3.22		7.30		0.02		4	

Date	24-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	10:33	2.45	26.7	26.7	<0.1	<0.1	7.72	7.73	96.4	96.5	1.67	1.6	7.00	7.0	0.01	0.01	4	3.5
			26.7		<0.1		7.73		96.5		1.62		7.00		0.01		3	

Date	27-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	11:02	2.45	26.6	26.6	<0.1	<0.1	7.62	7.62	94.6	94.6	4.27	4.3	7.22	7.2	0.01	0.01	2	2.5
			26.6		<0.1		7.61		94.5		4.3		7.22		0.01		3	

Date	29-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	14:30	2.45	25.1	25.1	<0.1	<0.1	5.95	5.92	72.1	71.7	2.4	2.5	7.54	7.5	0.01	0.01	8	7.0
			25.1		<0.1		5.88		71.2		2.6		7.54		0.01		6	

Water Quality Impact Monitoring Result for M4

Date	1-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	10:40	0.47	26.2	26.2	<0.1	<0.1	5.69	5.68	70.6	70.4	4.7	4.7	7.48	7.5	0.11	0.11	4	4.5
			26.2		<0.1		5.66		70.2		4.8		7.48		0.11		5	

Date	4-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	10:40	0.44	26.8	26.8	<0.1	<0.1	6.2	6.16	80.8	80.2	3.4	3.4	7.11	7.1	0.04	0.04	4	4.5
			26.8		<0.1		6.11		79.5		3.4		7.11		0.04		5	

Date	6-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	10:35	0.45	26.3	26.3	<0.1	<0.1	6.23	6.22	82.4	82.2	2.7	2.8	7.13	7.1	0.07	0.07	5	4.5
			26.3		<0.1		6.2		82.0		2.8		7.13		0.07		4	

Date	8-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	10:30	0.45	24.8	24.8	<0.1	<0.1	3.97	3.99	52.1	52.5	5.3	5.1	6.86	6.9	0.09	0.09	4	4.5
			24.8		<0.1		4.01		52.8		4.8		6.86		0.09		5	

Date	10-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	10:35	0.45	25.9	25.9	<0.1	<0.1	6.25	6.23	76.7	76.4	6.5	6.5	7.28	7.3	0.12	0.12	6	6.0
			25.9		<0.1		6.2		76.1		6.5		7.28		0.12		6	

Date	13-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	10:30	0.46	25.7	25.7	<0.1	<0.1	6.64	6.61	84.0	83.7	6.1	6.1	7.26	7.3	0.04	0.04	7	6.5
			25.7		<0.1		6.57		83.3		6.1		7.26		0.04		6	

Date	15-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	10:35	0.46	25.4	25.4	<0.1	<0.1	4.57	4.58	57.6	57.8	1.7	1.7	6.80	6.8	0.07	0.07	3	2.5
			25.4		<0.1		4.59		57.9		1.7		6.80		0.07		2	

Date	17-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	10:35	0.43	26.1	26.1	<0.1	<0.1	4.73	4.74	61.1	61.3	2.2	2.3	6.92	6.9	0.06	0.06	4	3.5
			26.1		<0.1		4.75		61.4		2.3		6.92		0.06		3	

Date	20-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	10:40	0.45	26.3	26.3	<0.1	<0.1	5.6	5.56	73.5	73.1	3.6	3.6	7.31	7.3	0.05	0.05	5	4.5
			26.3		<0.1		5.52		72.7		3.6		7.31		0.05		4	

Date	22-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	11:00	0.44	26.9	26.9	<0.1	<0.1	6.13	6.10	82.5	82.0	5.3	5.0	6.80	6.8	0.07	0.07	4	4.0
			26.9		<0.1		6.07		81.5		4.7		6.80		0.07		4	

Date	24-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	9:45	0.44	27.3	27.3	<0.1	<0.1	4.5	4.51	58.9	59.0	0.9	1.0	7.73	7.7	0.12	0.12	<2	<2
			27.3		<0.1		4.52		59.1		1.0		7.73		0.12		<2	

Date	27-Jun-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	10:20	0.43	26.8	26.8	<0.1	<0.1	4.36	4.37	57.6	57.7	3.4	3.4	6.77	6.8	0.07	0.07	4	3.5
			26.8		<0.1		4.37		57.7		3.4		6.78		0.07		3	

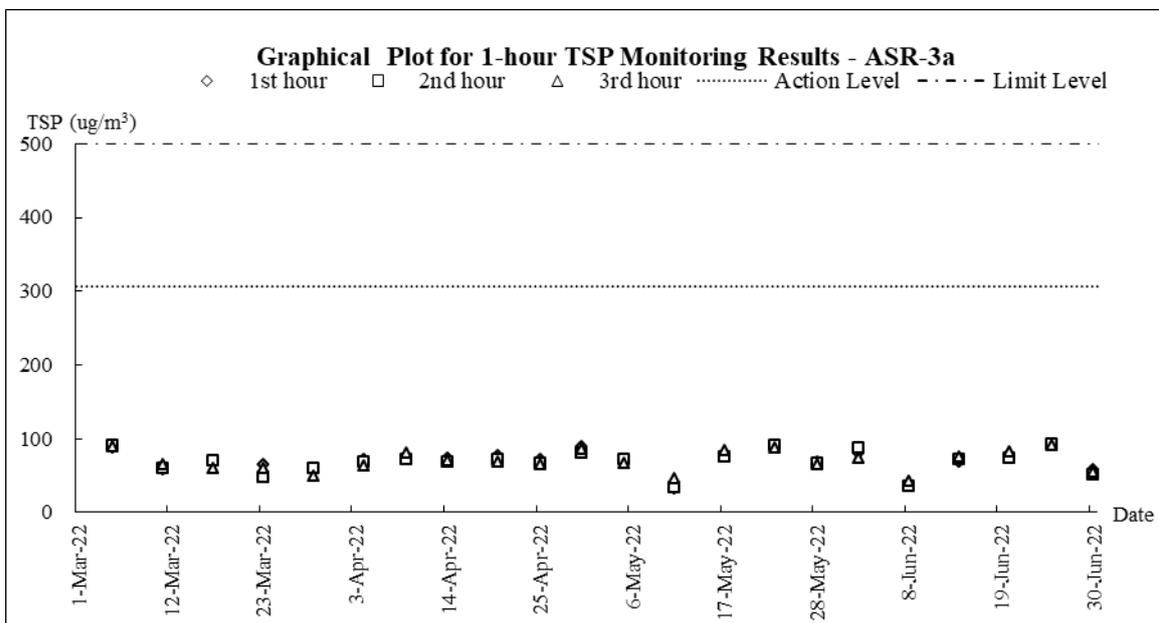
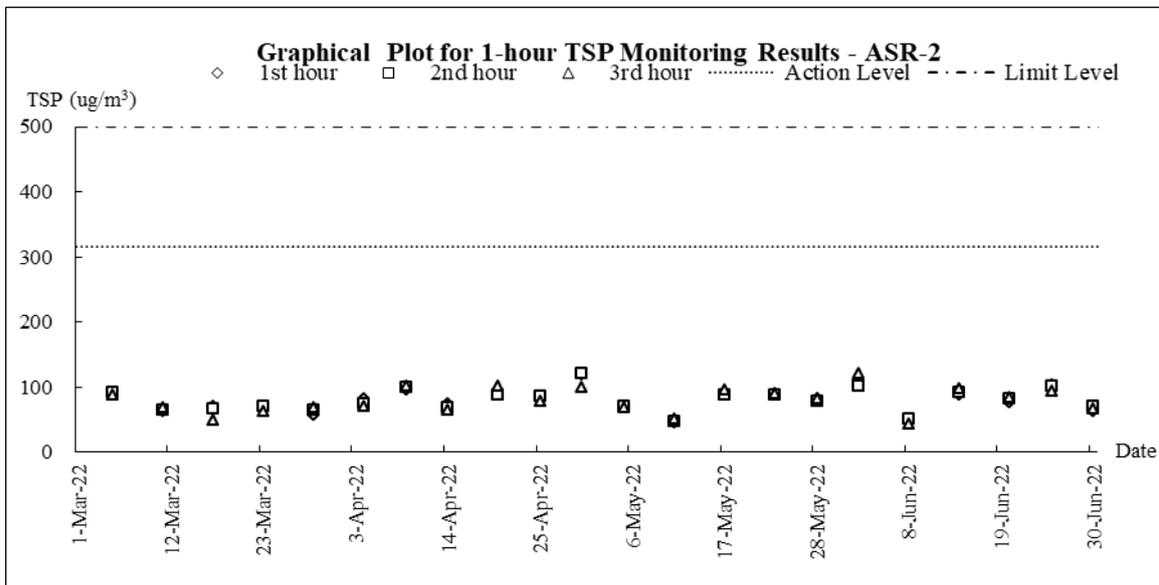
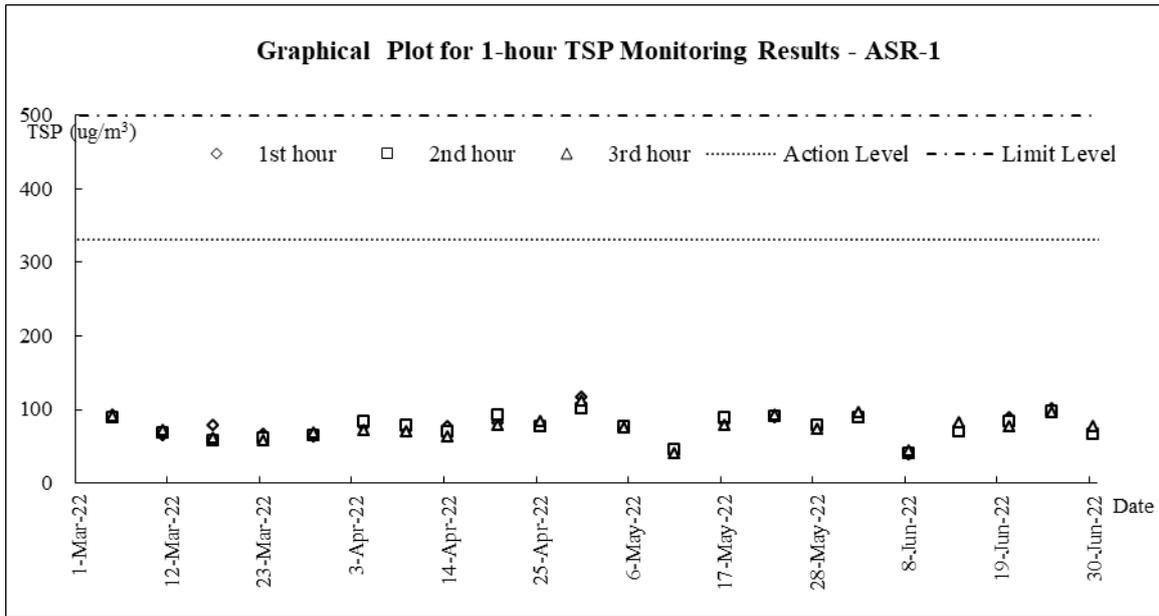
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Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	9:50	0.44	26.1	26.1	<0.1	<0.1	6.42	6.40	84.5	84.3	2.2	2.3	6.76	6.8	0.07	0.07	3	2.5
			26.1		<0.1		6.38		84.0		2.3		6.76		0.07		2	

	Limit Level exceedance
--	---------------------------

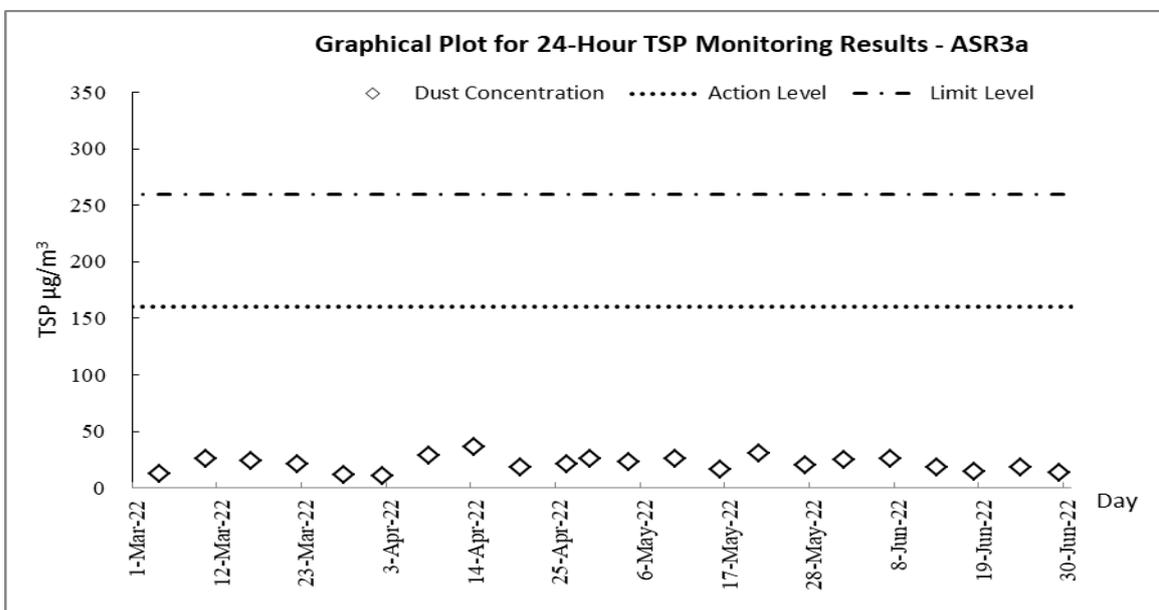
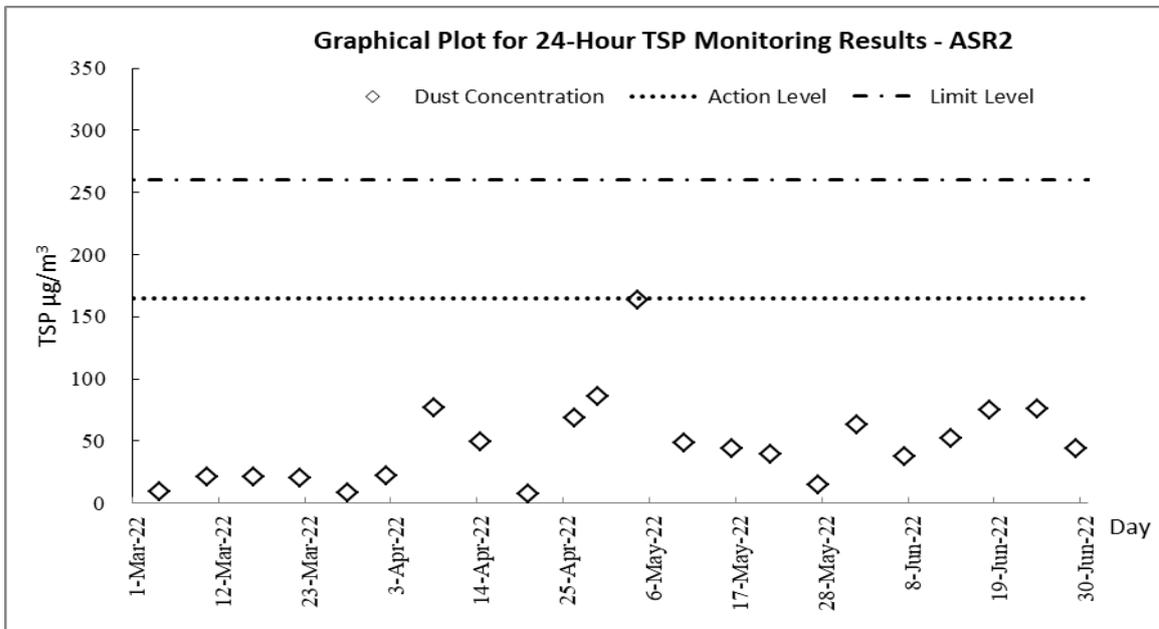
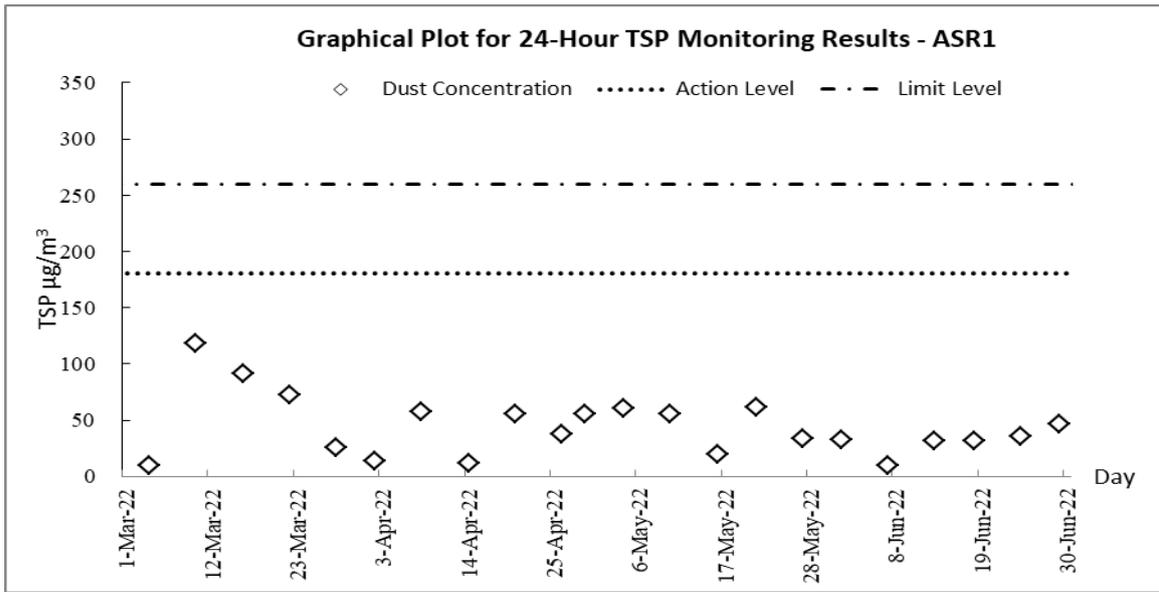
Appendix I

Graphical Plots of Air Quality, Noise and Water Quality

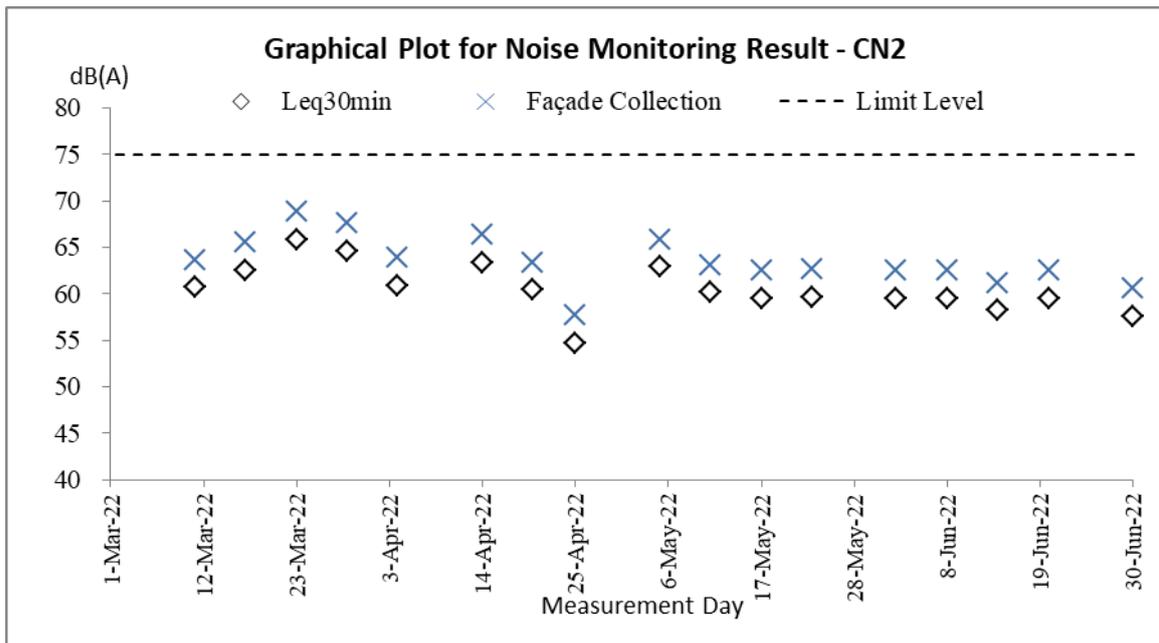
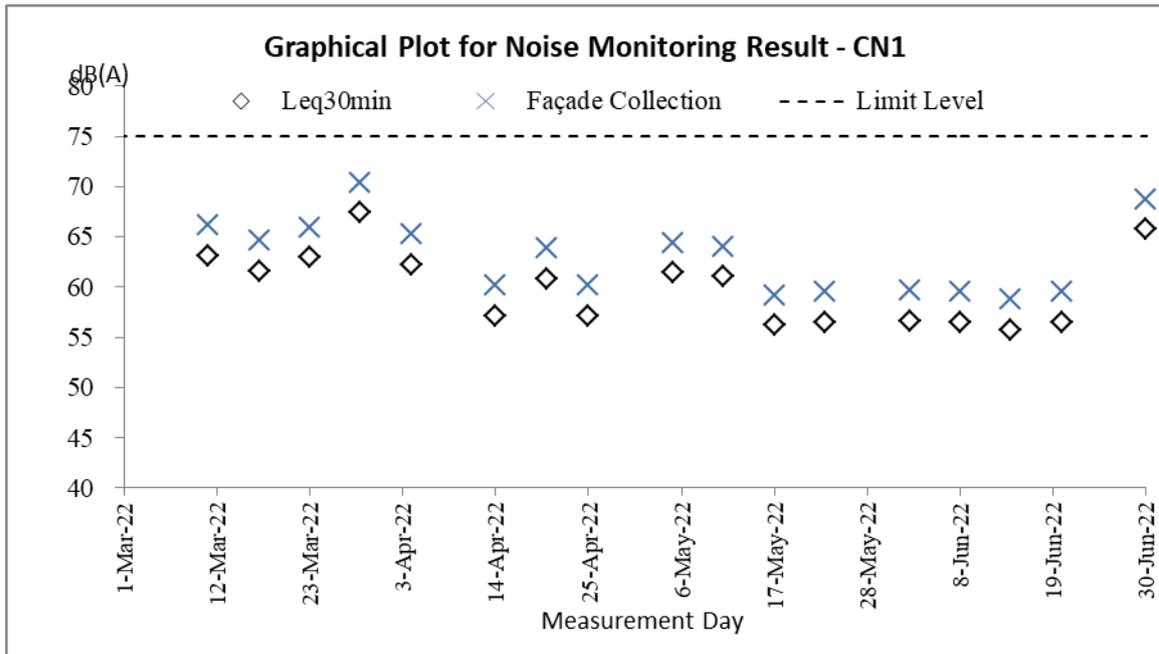
Air Quality Impact Monitoring – 1-hour TSP

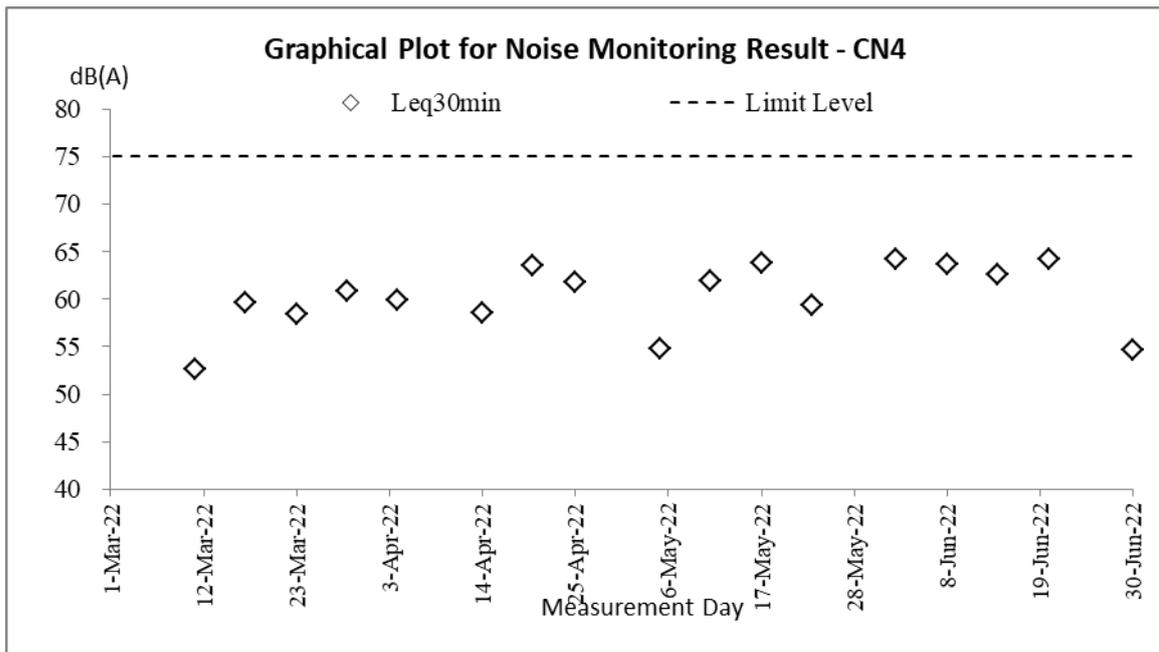
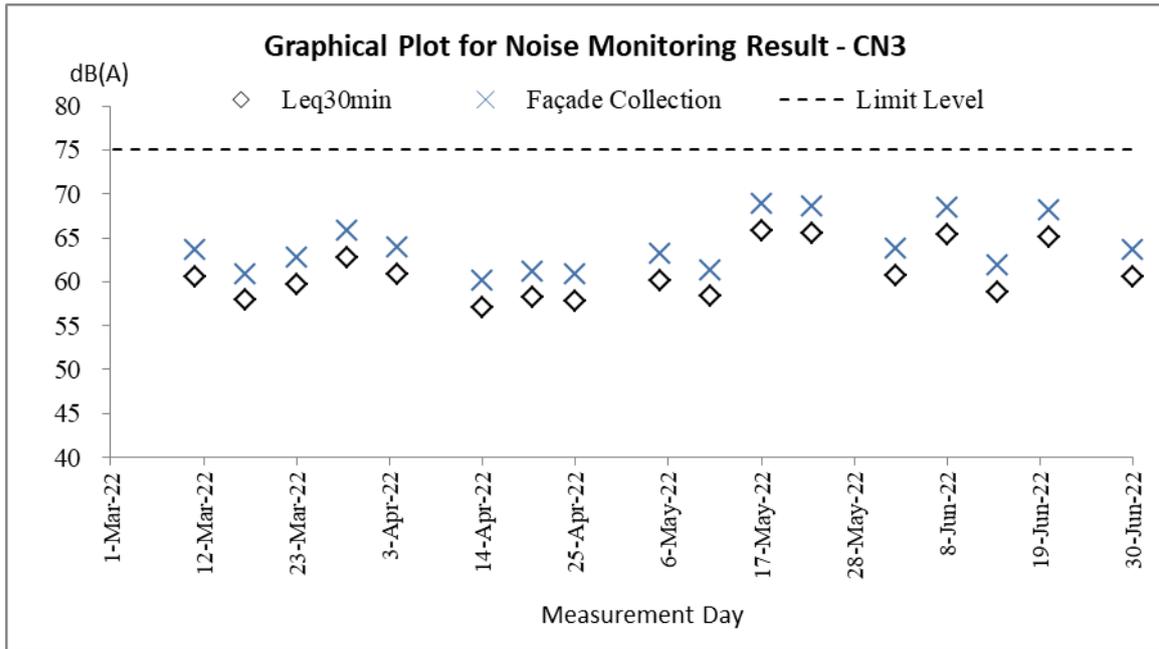


Air Quality Impact Monitoring – 24-hour TSP

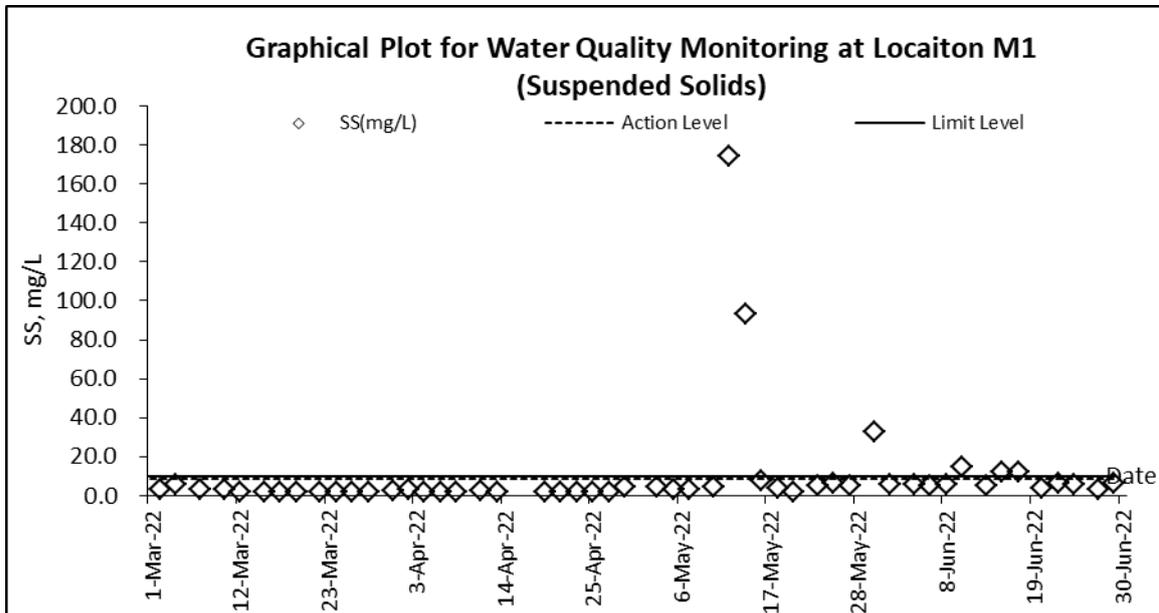
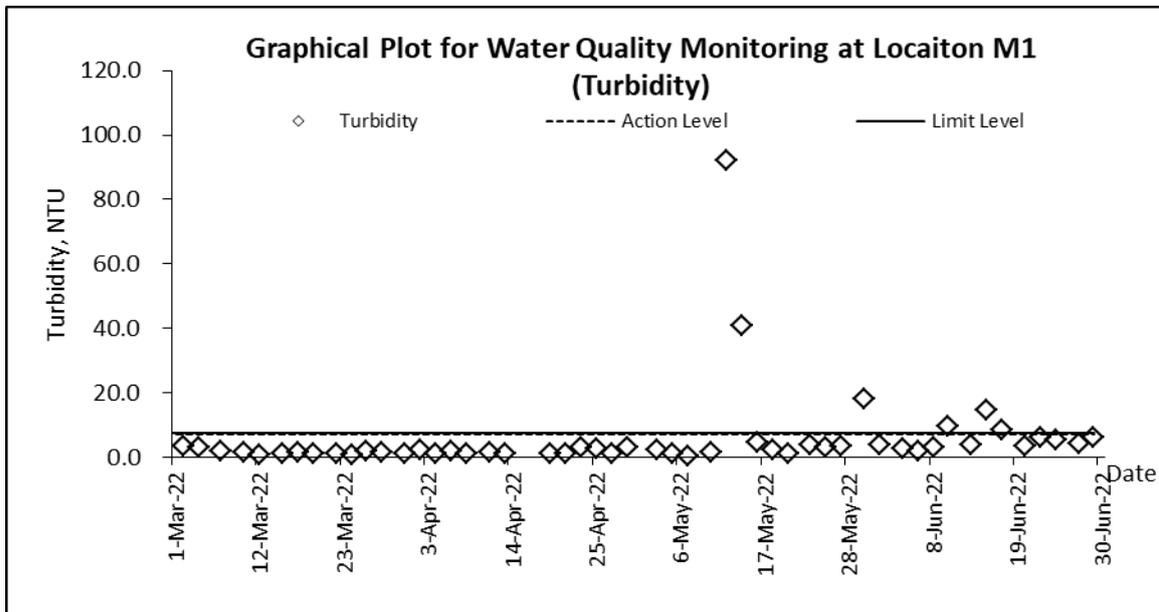
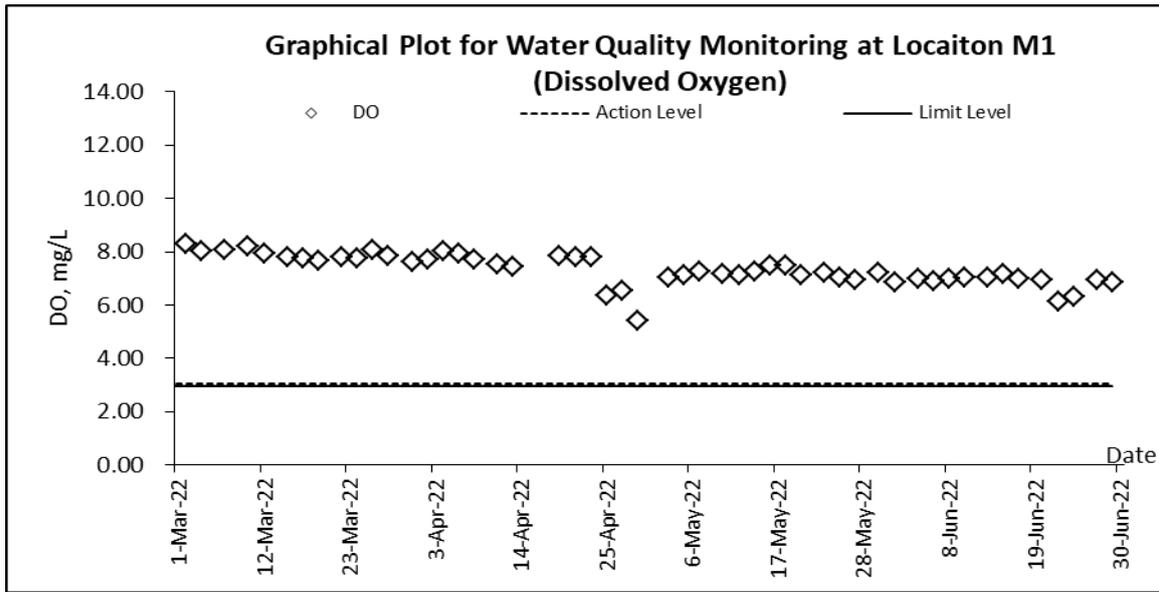


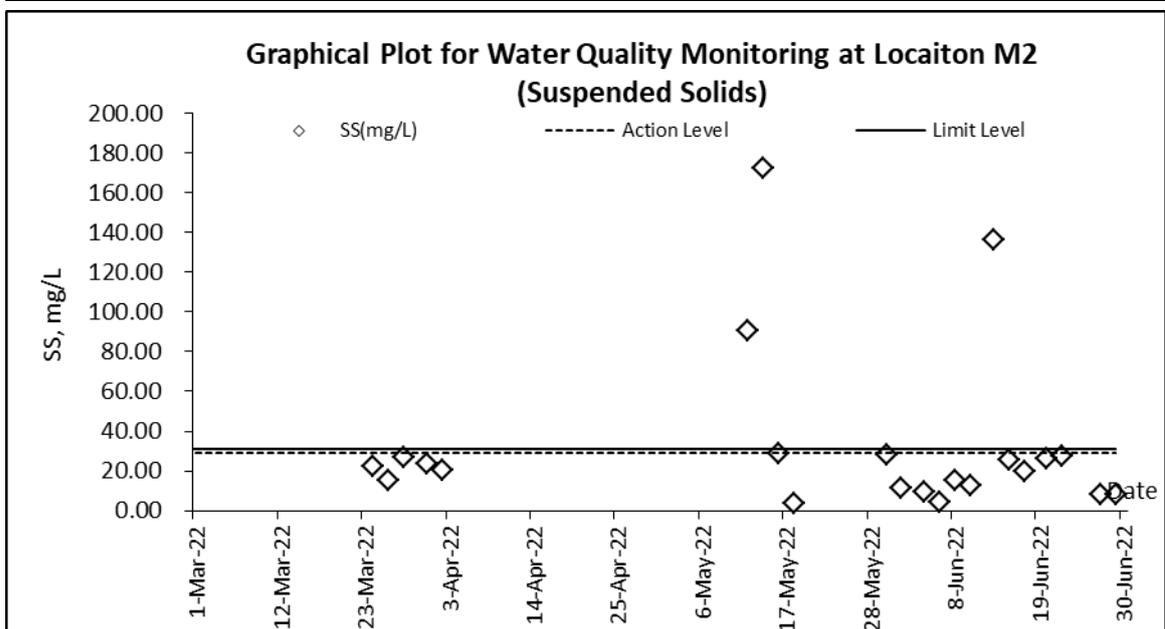
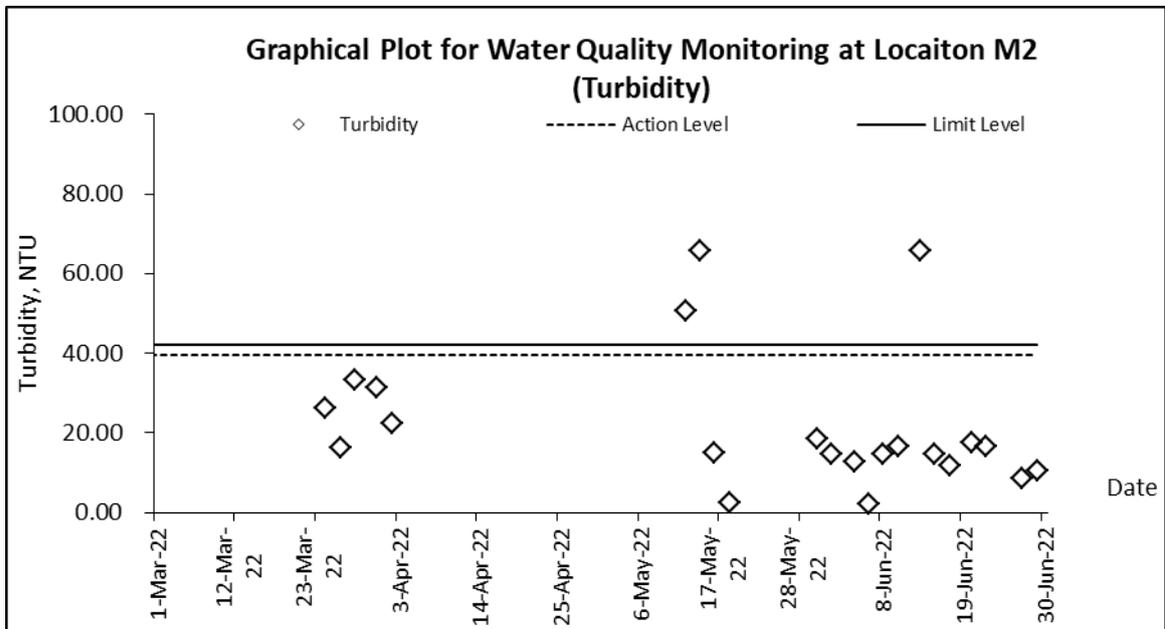
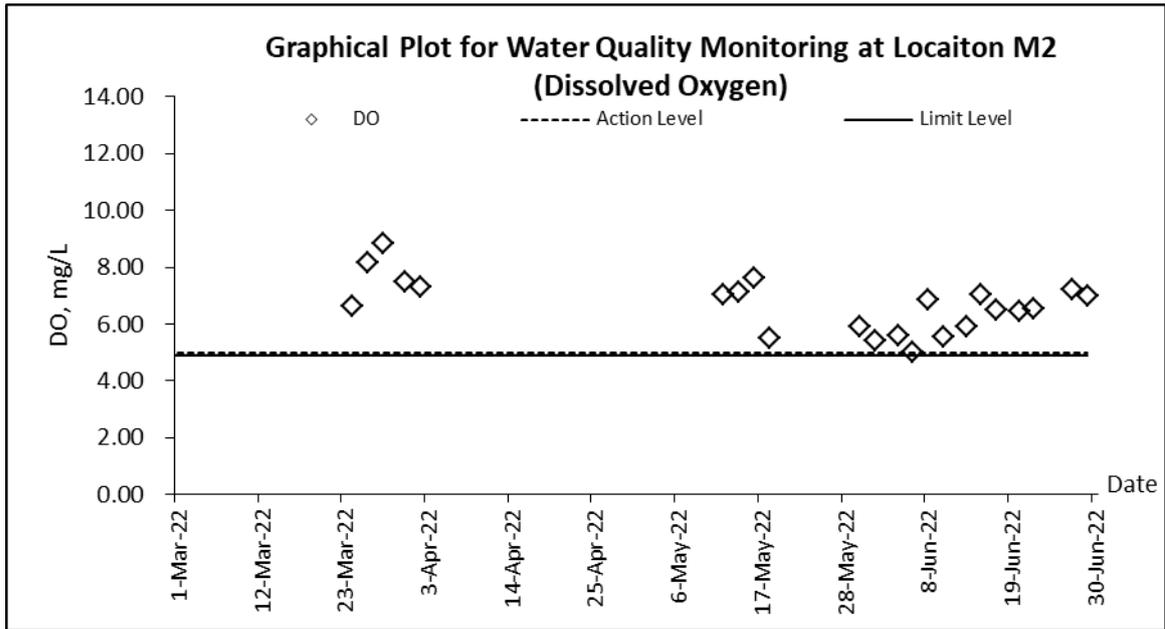
Construction Noise Impact Monitoring

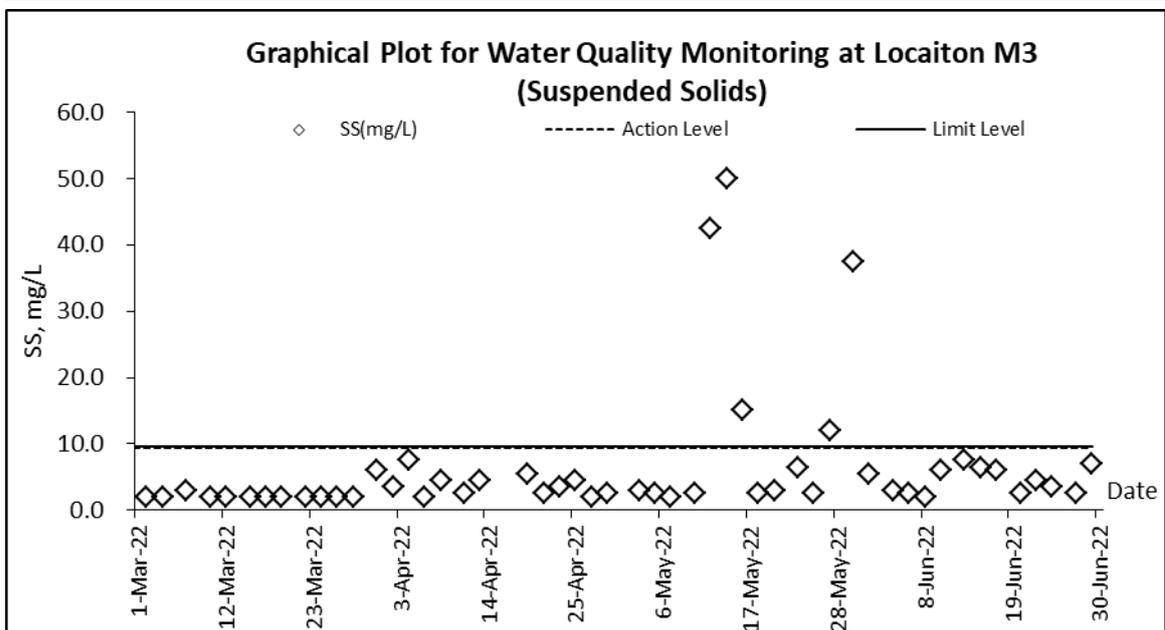
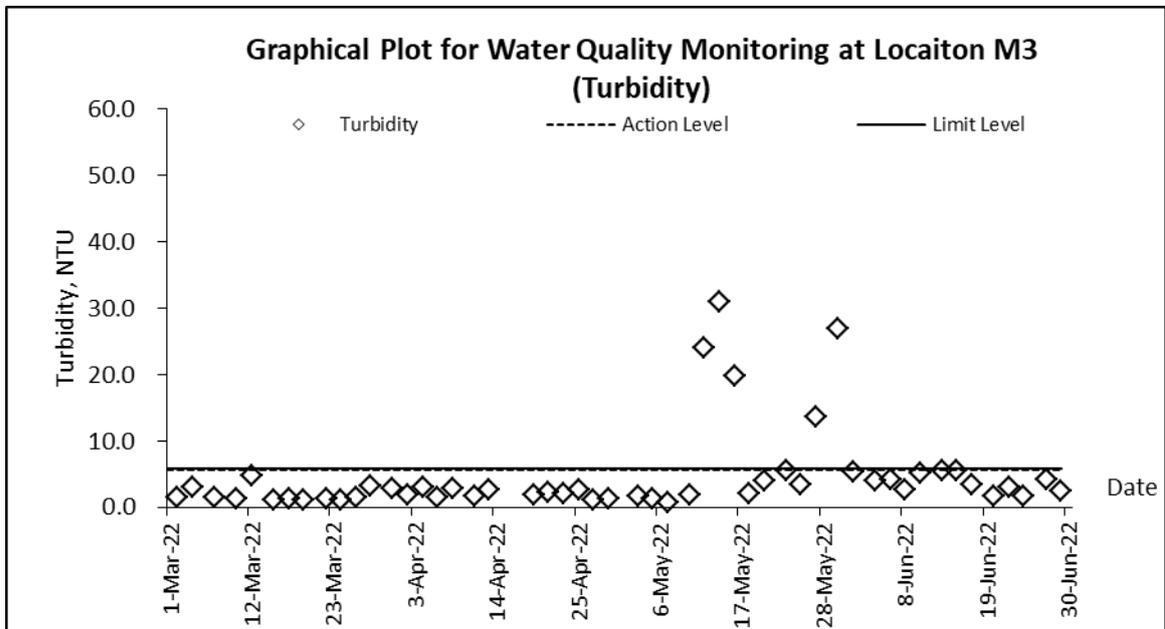
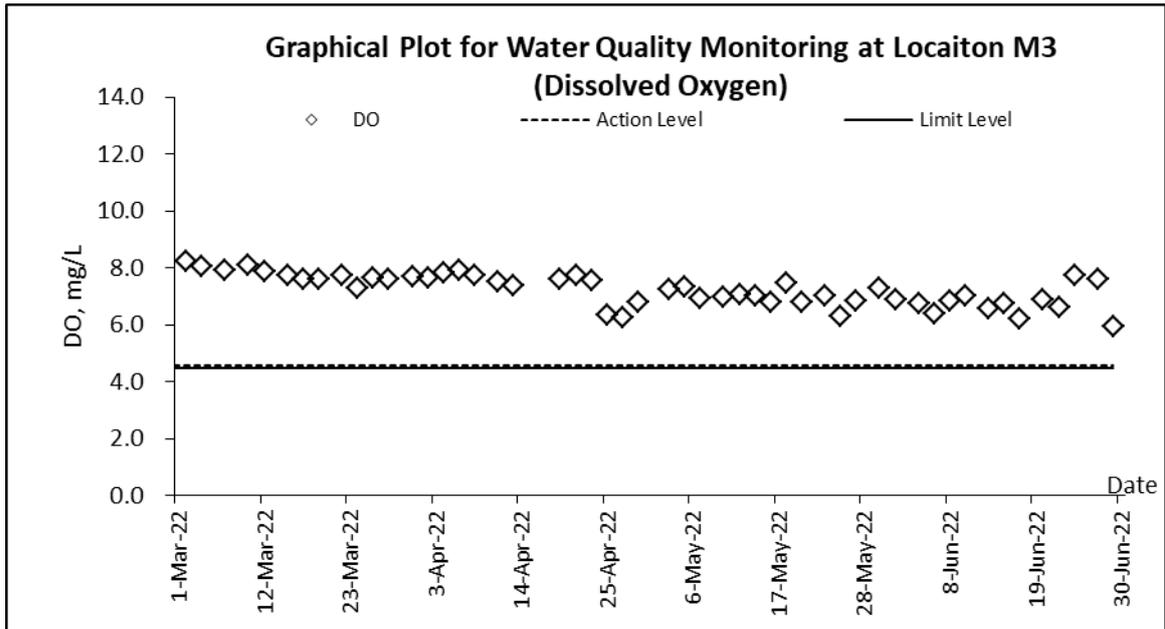


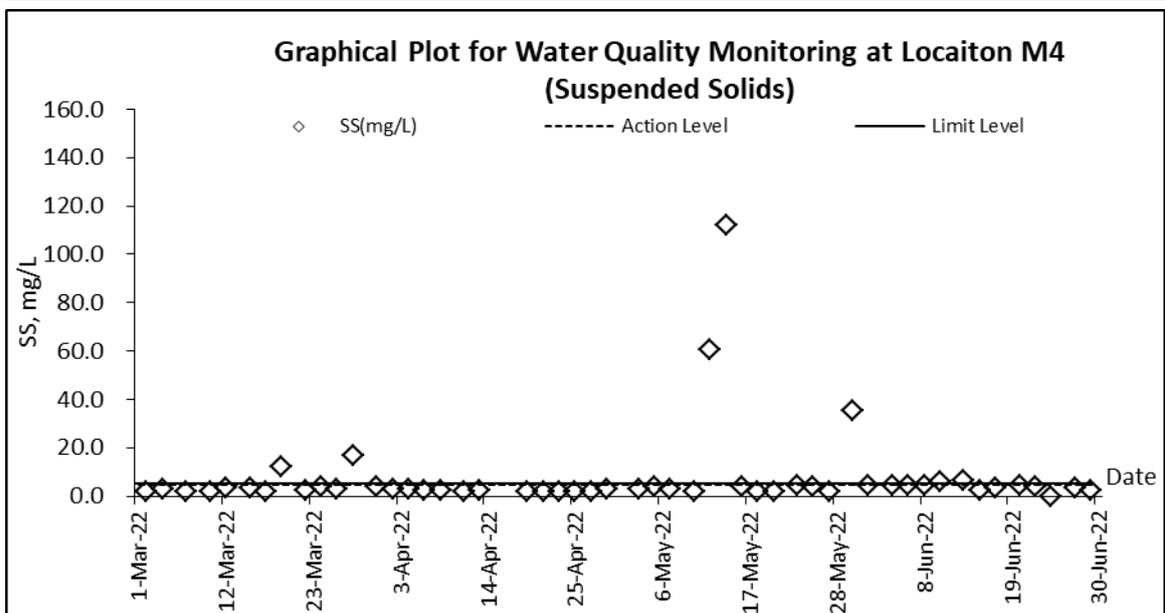
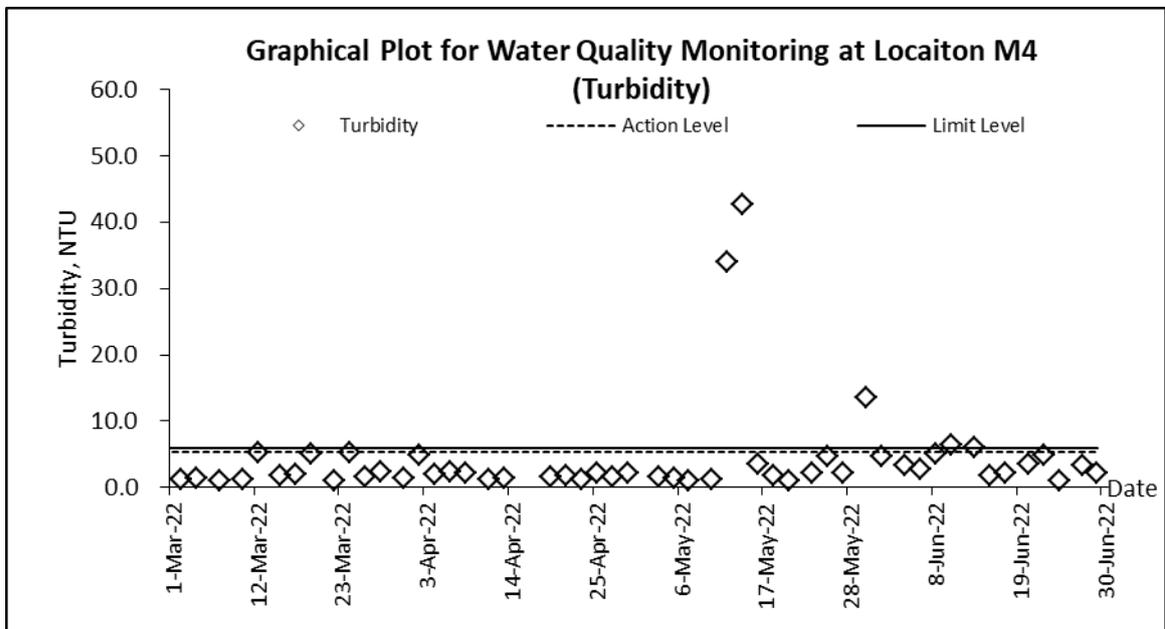
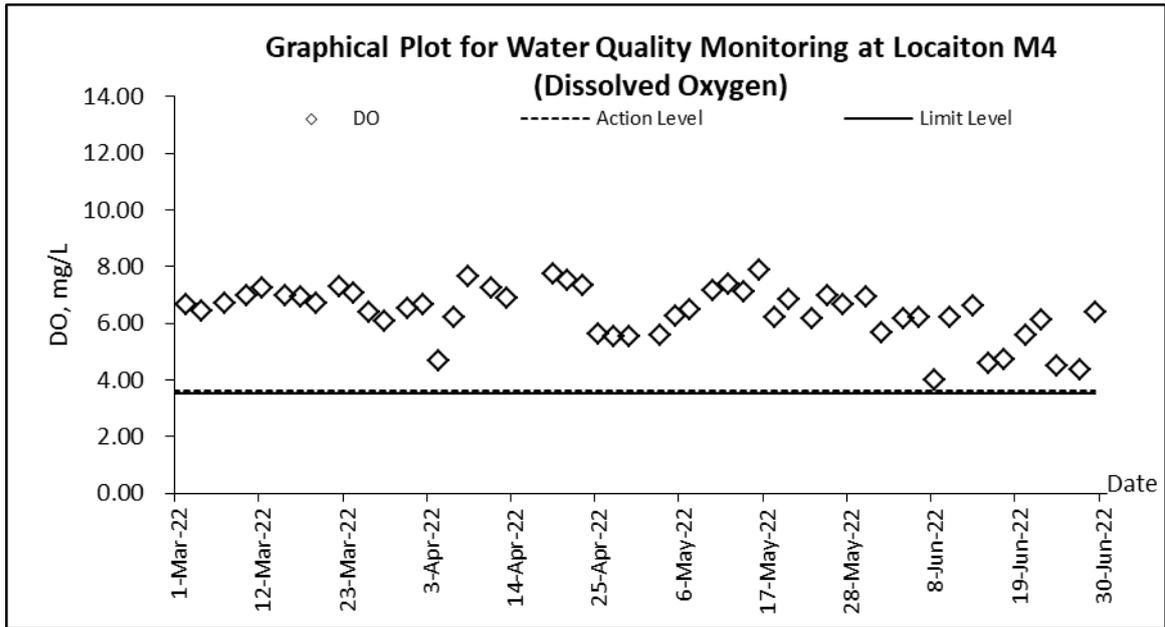


Water Quality Impact Monitoring









Appendix J

Meteorological Data of the Reporting Month

Date		Weather	Total Rainfall (mm)	Ta Kwu Ling Station			
				Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Jun-22	Wed	Moderate to fresh southwesterly winds	1.2	29.3	8.5	80.7	S/SW
2-Jun-22	Thu	a few showers and thunderstorms.	11.9	28.9	9.5	83.0	SW
3-Jun-22	Fri	Moderate to fresh southerly winds.	1.6	28.2	7	86.7	S
4-Jun-22	Sat	Moderate to fresh southwesterly winds.	Trace	29.8	8.7	77.5	S/SW
5-Jun-22	Sun	a few showers and thunderstorms.	Trace	29.4	9.2	74.5	S/SW
6-Jun-22	Mon	Hot with sunny intervals	2.5	28.8	7.5	84.7	SW
7-Jun-22	Tue	Cloudy with showers and squally thunderstorms	33.8	26.7	8.5	90.5	E/SE
8-Jun-22	Wed	Cloudy to overcast with heavy showers and severe squally thunderstorms	66	25.7	6.2	94.0	E/SE
9-Jun-22	Thu	a few showers and thunderstorms.	28.7	26.6	4.5	88.5	SE
10-Jun-22	Fri	Sunny periods in the afternoon	25.8	27.1	7	86.7	SE
11-Jun-22	Sat	Moderate to fresh southwesterly winds	47.5	26.7	8.5	91.0	E/SE
12-Jun-22	Sun	Sunny periods in the afternoon	2.6	28.3	7.5	87.0	S/SW
13-Jun-22	Mon	Hot with isolated showers.	0	29.5	9.5	81.0	S/SW
14-Jun-22	Tue	a few showers and thunderstorms.	42.8	27.3	7	87.5	W/SW
15-Jun-22	Wed	Hot with sunny intervals	11	27.3	7	87.5	E/SE
16-Jun-22	Thu	Cloudy with showers and squally thunderstorms	2.6	27.9	8.7	80.0	S/SW
17-Jun-22	Fri	Cloudy to overcast with heavy showers and severe squally thunderstorms	1	28.9	9.5	81.5	S/SW
18-Jun-22	Sat	Hot with isolated showers.	1.3	28.5	10.2	79.7	S/SW
19-Jun-22	Sun	a few showers and thunderstorms.	0.1	28.9	11	78.0	S/SW
20-Jun-22	Mon	Mainly fine overnight.	2.8	28.9	9	79.7	S/SW
21-Jun-22	Tue	Fine and very hot. Light winds.	Trace	29.5	9.2	75.0	S/SW
22-Jun-22	Wed	Mainly fine and very hot	0	29.6	29.6	6.2	S
23-Jun-22	Thu	Fine and very hot. Light winds.	0	30.4	30.4	6.2	SW
24-Jun-22	Fri	Moderate easterly winds.	0	28.9	28.9	8.7	W/SW
25-Jun-22	Sat	Mainly fine overnight.	0	28.6	28.6	7.5	S/SW
26-Jun-22	Sun	Very hot with sunny periods during the day.	0.3	29.1	29.1	5.0	S/SW
27-Jun-22	Mon	Very hot in the afternoon.	0.1	29.7	29.7	6.2	S/SE
28-Jun-22	Tue	Very hot with sunny periods during the day.	0	30.1	30.1	8.7	SE
29-Jun-22	Wed	Sunny periods and a few showers.	0.7	30.1	30.1	10.0	E
30-Jun-22	Thu	Mainly cloudy with squally showers and thunderstorms.	0	29.3	29.3	14.2	E

Appendix K

Ecological Survey Report

Ecological Survey Report for Contract CV/2016/10

Contract No. CV/2016/10

Site Formation and Associated Infrastructural Works for Development of Columbarium, Crematorium and Related Facilities at Sandy Ridge Cemetery

Monthly Report of Ecologically Sensitive Habitats Monitoring – June 2022

Revision	0	
Date of issue	28 Jun 2022	
Prepared by	Alan Lam	
Reviewed by	Rachel Siu	
Verified by	Mike Leung	

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1 INTRODUCTION

1.1 BACKGROUND

- 1.1.1 The main objective of the proposed site formation and associated infrastructural works for development of columbarium, crematorium (C&C) and related facilities at Sandy Ridge Cemetery is to increase the public cremation services and supply of public niches to meet the future demand.
- 1.1.2 The project includes site formation and associated works for development of C&C facilities at the Sandy Ridge Cemetery, road works within Sandy Ridge Cemetery, widening a section of Lin Ma Hang Road (from 6.5m to 7.3m), provision of off-site pick-up/drop-off points for shuttle buses as well as barging point at Siu Lam, Lok On Pai.
- 1.1.3 The Environmental Impact Assessment (EIA) report, including Environmental Monitoring and Audit Manual (EM&A Manual), was approved with conditions on 8 August 2016 (Register No.: AEIAR-198/2016). EPD issued an Environmental Permit (EP) for the Project (EP-534/2017) on 7 April 2017. A Further Environment Permit (FEP) for the Project (FEP-01/534/2017) was issued on 23 February 2018, variation of EP (EP-534/2017/A) and variation of FEP (FEP-01/534/2017/A) were issued on 24 December 2018.
- 1.1.4 According to Clause 3.1 of the FEP (FEP-01/534/2017/A), “The Permit Holder shall implement the EM&A programme in accordance with the procedures and requirements as set out in the EM&A Manual. Any changes to the programme shall be justified by the ET Leader and verified by the IEC as conforming to the information and requirements contained in the EM&A Manual before submission to the Director for approval”.
- 1.1.5 This Ecologically Sensitive Habitats Monitoring Methodology articulates the protocol of monitoring the ecology of concerned habitats as specified in EM&A Manual.

1.2 OBJECTIVE

- 1.2.1 According to approved EIA report (AEIAR-198/2016), habitat types within project boundary comprise of watercourse, grassland, upland grassland, plantation, woodland and developed area. Natural habitats were of moderate ecological value in terms of species diversity, species rarity, species abundance, ecological linkage as well as nursery. Moreover, 0.3ha of wet woodland on the northern side of Sandy Ridge was deemed habitat with high ecological value. Four types of habitats were regarded as ecologically sensitive habitats, namely wet woodland, watercourses, upland grassland and woodland. Considering human disturbance in upcoming construction and operation phases, ecologically sensitive habitats shall be monitored in accordance with EM&A Manual.
- 1.2.2 The objective of ecologically sensitive habitats monitoring is to evaluate the effectiveness of measures to minimize impacts on concerned habitats from disturbance and pollution.

2 ECOLOGICALLY SENSITIVE HABITATS

2.1 DESCRIPTION OF HABITATS

- 2.1.1 In order to monitor the effectiveness of the measures to the minimise impact on ecologically sensitive habitats from disturbance and pollution, monthly monitoring during construction and operation phases is required as specified in EM&A Manual. Standard faunal transect and sampling surveys cover both wetland and non-wetland habitats:

Wetland habitats	Non-wetland habitats
Wet Woodland	Upland Grassland
Watercourses	Woodland

- 2.1.2 Wet woodland is small patch present on northwest of the project boundary, and is confined by the marsh area to the north and the secondary woodland to the east, south and south-west parts. A number of mature trees *Cleistocalyx nervosum* and *Acronychia pedunculata* form the tree canopy, with other self-sown shrubs (including *Psychotria asiatica*, *Ligustrum sinense* and *Glochidion lanceolarium*) and trees (*Aporosa dioica* and *Litsea monopetala*). Whilst botanically it comprises of naturally regenerated secondary woodland and ground level are a series of small braided streams and weep points which even during the dry season remain wet. This creates a rather uncommon habitat in Hong Kong offering suitable conditions for a good assemblage of common wetland species. The wet woodland provides a good assemblage of micro-habitats, which is relatively undisturbed and has good linkages to other natural habitats. Several species of conservation importance were recorded in EIA report from this habitat: East Asian Porcupine, Leopard Cat, Red Muntjac, Two-striped Grass Frog, Small Snakehead, *Somaniathelphusa zanklon*, Dancing Shadow-emerald.
- 2.1.3 Seasonal watercourse running west to east in the eastern part of the area inside the Project boundary is shallower in gradient than those running off the hillside. This seasonal watercourse is heavily vegetated with wetland-associated herbs including *Commelina diffusa*, *Polygonum chinense*, *Colocasia esculenta* and *Dracaena sanderiana*. A mature tree of *Aquilaria sinensis* was recorded at the bank of the seasonal watercourse to the west of the Sandy Ridge Cemetery Office. Seasonal watercourses are restricted to the steeper slopes within the project boundary and are characterised by being entirely dry for much of the dry season. However, endemic crab *S. zanklon* population is supported by ephemeral watercourses close to the project boundary.
- 2.1.4 Upland grassland is the major habitat within the project boundary. The semi-natural habitat is dominated by typical upland grassland species: fern *Dicranopteris pedata*, grass *Neyraudia reynaudiana*, *Miscanthus floridulus*, climbing vines *Smilax china*, *Smilax glabra*, and shrubs such as *Rhodomyrtus tomentosa*, *Breynia fruticosa* and *Helicteres angustifolia*. Approximately 30 flowering spikes of two orchid species Bamboo Orchid and Toothed Habenaria were recorded near the hill top in the northern part of this upland grassland. Golden-headed Cisticola, which is considered as Local Concern by Fellowes *et al.* (2002), was also recorded in upland grassland on Sandy Ridge, including a proved breeding record of fledged young in September 2013. In addition, numerous species of conservation interest were recorded in EIA report, such as East Asian Porcupine, Leopard Cat, Red Muntjac, Great Swift, Tamil Grass Dart, Small Three-ring and Small Grass Yellow.

2.1.5 Scattered patches of woodland are present throughout the assessment area, with the largest contiguous block located immediately to the east of the project boundary. These woodlands are relatively young with single-layered of canopy dominants (~10 – 15m tall) including *A. dioica*, *Bridelia tomentosa*, *Cinnamomum burmannii*, *Daphniphyllum calycinum*, *Litsea glutinosa*, *Rhus succedanea*, and *Zanthoxylum avicennae*. Such areas comprise secondary woodland which is largely derived from natural regeneration and colonisation of trees as a result of seed dispersal by birds and/or bats. A mature tree of *A. sinensis* is located at the woodland edge at the central part of the Project according to EIA report.

2.2 MONITORING MEASURES OF WETLAND HABITATS

2.2.1 Wetland habitats include wet woodland and watercourses. Monitoring surveys using standardised quantitative methodology will be conducted at fixed points. For seasonal watercourse, survey shall be conducted whenever the habitat appears.

2.2.2 Measures to respond to decreases in numbers of aquatic fauna using the wetland habitats and action and limit levels to trigger these measures are detailed in Table 1.

Action Level	Response	Limit Level	Response
Reduction in taxa diversity by 30%	Investigate cause and if cause identified as related to the project instigate remedial action to remove or reduce source of disturbance.	Reduction in taxa diversity by 50%	Investigate cause and if cause identified as related to the project instigate remedial action.

Table 1 Action and Limit Levels and Responses to Evidence of Declines in Aquatic Fauna

2.3 MONITORING MEASURES OF NON-WETLAND HABITATS

2.3.1 Non-wetland habitats consist of upland grassland and woodland. Monthly quantitative surveys of non-aquatic fauna will be conducted using standard route transect counts.

2.3.2 Measures to respond to decreases in numbers of non-aquatic fauna using the non-wetland habitats and action and limit levels to trigger these measures are detailed in Table 2.

Action Level	Response	Limit Level	Response
Reduction in species diversity by 30%	Investigate cause and if cause identified as related to the project instigate remedial action to remove or reduce source of disturbance.	Reduction in species diversity by 50%	Investigate cause and if cause identified as related to the project instigate remedial action.

Table 2 Action and Limit Levels and Responses to Evidence of Declines in Non-Aquatic Fauna

3 METHODOLOGY

The ecological survey includes all taxa being investigated in EIA report. Table 3 summarizes schedule of faunal surveys.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mammals	√	√	√	√	√	√	√	√	√	√	√	√
Birds (day)	√	√	√	√	√	√	√	√	√	√	√	√
Birds (night)				√	√	√	√	√	√	√		
Herpetofauna				√	√	√	√	√	√	√		
Dragonflies			√	√	√	√	√	√	√	√		
Butterflies			√	√	√	√	√	√	√	√		
Aquatic fauna	√	√	√	√	√	√	√	√	√	√	√	√

Table 3 Survey Schedule

3.1 MAMMAL SURVEY

- 3.1.1 Mammal surveys will be conducted along the transects shown in Appendix 1 during both daytime and night time periods. Along with direct observations, other field signs, such as scats and tracks, will be searched and recorded if present.

3.2 BIRD SURVEY

- 3.2.1 Bird surveys will be conducted along the transects shown in Appendix 1 during the surveys, species and their vocalizing individuals recorded will be enumerated and recorded according to the habitat(s) they are utilising.

3.3 HERPETOFAUNA SURVEY

- 3.3.1 Reptile and amphibian surveys will be conducted along transects shown in Appendix 1 during surveys careful searches of appropriate microhabitats and refugia for reptiles and their vocalizing individuals will be undertaken and all reptiles observed will be identified and counted.

3.4 DRAGONFLY SURVEY

- 3.4.1 Dragonfly surveys will be conducted along transects shown in Appendix 1 during surveys all dragonflies seen will be identified and counted as accurately as possible.

3.5 BUTTERFLY SURVEY

- 3.5.1 Butterfly surveys will be conducted along transects shown in Appendix 1 during surveys all butterflies seen will be identified and counted as accurately as possible.

3.6 AQUATIC FAUNA SURVEY

- 3.6.1 Freshwater fishes and macro-invertebrates will be recorded by direct observation. All species trapped/recorded will be enumerated and identified (to the lowest taxonomic level possible), and the species of conservation importance photographed.

4 RESULT

This monitoring survey started on 14th June 2022, a sunny day. The day and night survey covered wetland and non-wetland areas. The survey was conducted by transect and at fixed points. All species seen will be identified and counted as accurately as possible.

■ Mammal

There was one mammal species of conservation interests recorded in the monitoring area:
Eurasian Wild Pig (*Sus scrofa*) 野豬.

■ Bird

There were a total of 36 bird individuals from 11 species recorded in the monitoring area. No Golden-headed Cisticola was observed during the bird survey. Two species of conservation interests was recorded in this survey: Lesser Coucal (*Centropus bengalensis*) 小鴉鵂 and Black Kite (*Milvus migrans*) 黑鷲.

■ Herpetofauna

There was no reptile species recorded in the monitoring area.
There was 3 amphibian species recorded in the monitoring area.

■ Butterfly

There were a total of 4 butterfly individuals from 2 species recorded in the monitoring area.

■ Dragonfly

There were a total of 17 odonate individuals from 6 species recorded in the monitoring area. One species of conservation interests was recorded in this survey: Scarlet Dwarf (*Nannophya pygmaea*) 侏紅小蜻.

■ Freshwater communities

There was no freshwater community recorded in the monitoring area.

Picture 1

Wet woodland in monitoring area.



Picture 2

Nannophya pygmaea Scarlet Dwarf 侏紅小蜻



Table 4 Result of mammal in survey

Scientific Name	Common Name	Chinese Name	Conservation Status	14/06/2022				
				Non-wetland		Wetland		
				UG	WL	MA	WW	WC
<i>Sus scrofa</i>	Eurasian Wild Pig	野豬	Fellowes et al. (2002): (PRC)	2				

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse

Table 5 Result of Avifauna in survey

Scientific Name	Common Name	Chinese Name	Conservation Status	14/06/2022				
				Non-wetland		Wetland		
				UG	WL	MA	WW	WC
<i>Fringilla monticola</i>	Chinese Francolin	中華鷓鴣		1				
<i>Milvus migrans</i>	Black Kite	黑鳶	Fellowes et al. (2002): (RC); Appendix 2 of CITES	2				
<i>Spilopelia chinensis</i>	Spotted Dove	珠頸斑鳩		2	2			
<i>Centropus bengalensis</i>	Lesser Coucal	小鴉鵂	Class 2 Protected Animal of China; China Red Data Book Status: (Vulnerable)	1				
<i>Pycnonotus jocosus</i>	Red-whiskered Bulbul	紅耳鶇		4			3	
<i>Pycnonotus sinensis</i>	Chinese Bulbul	白頭鶇					2	
<i>Pycnonotus aurigaster</i>	Sooty-headed Bulbul	白喉紅臀鶇					3	
<i>Prinia flaviventris</i>	Yellow-bellied Prinia	黃腹鷦鶯			1		1	
<i>Orthotomus sutorius</i>	Common Tailorbird	長尾縫葉鶯			2			
<i>Garrulax perspicillatus</i>	Masked Laughingthrush	黑臉噪鶇		8				
<i>Motacilla alba</i>	White Wagtail	白鶇鶇					4	

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse

Table 6 Result of reptile in survey

Scientific Name	Common Name	Chinese Name	Conservation Status	14/06/2022				
				Non-wetland		Wetland		
				UG	WL	MA	WW	WC
N/A								

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse

Table 7 Result of amphibian in survey

Scientific Name	Common Name	Chinese Name	Conservation Status	14/06/2022				
				Non-wetland		Wetland		
				UG	WL	MA	WW	WC
<i>Kaloula pulchra</i>	Asiatic Painted Frog	花狹口蛙						+
<i>Fejervarya limnocharis</i>	Paddy Frog	澤蛙						+
<i>Polypedates megacephalus</i>	Brown Tree Frog	斑腿泛樹蛙						+

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse
 + Species appeared but uncountable

Table 8 Result of butterfly in survey

Scientific Name	Common Name	Chinese Name	Conservation Status	14/06/2022				
				Non-wetland		Wetland		
				UG	WL	MA	WW	WC
<i>Abisara echerius</i>	Plum Judy	蛇目褐蛩蝶		2				
<i>Catopsilia pomona</i>	Lemon Emigrant	遷粉蝶		2				

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse

Table 9 Result of Odonate in survey

Scientific Name	Common Name	Chinese Name	Conservation Status	14/06/2022				
				Non-wetland		Wetland		
				UG	WL	MA	WW	WC
<i>Onychargia atrocyana</i>	Marsh Dancer	毛面同痣蟴						2
<i>Ceriagrion auranticum</i>	Orange-tailed Sprite	翠胸黃蟴						8
<i>Brachydiplax chalybea</i>	Blue Dasher	藍額疏脈蜻						2
<i>Pantala flavescens</i>	Wandering Glider	黃蜻						1
<i>Nannophya pygmaea</i>	Scarlet Dwarf	侏紅小蜻	Fellowes et al. (2002): LC					3
<i>Macromidia rapida</i>	Common Shadow-emerald	颯中偽蜻						1

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse

Table 10 Result of freshwater communities in survey

Scientific Name	Common Name	Chinese Name	Conservation Status	14/06/2022				
				Non-wetland		Wetland		
				UG	WL	MA	WW	WC
N/A								

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse

5 DISCUSSION

Data analysis was carried out to compare with the biodiversity within the site boundary in the same month over years. General description of the ecological conditions is first revealed in terms of abundance as well as species richness, following by statistical analysis of the existing database. The result is considered as significant whenever the drop of diversity indexes exceeds the percentages mentioned in previous sections 2.2 and 2.3.

5.1 Total abundance and species richness in June over years were compared to show the trends. Figures 1 and 2 indicate the total species richness and total abundance within the site boundary respectively.

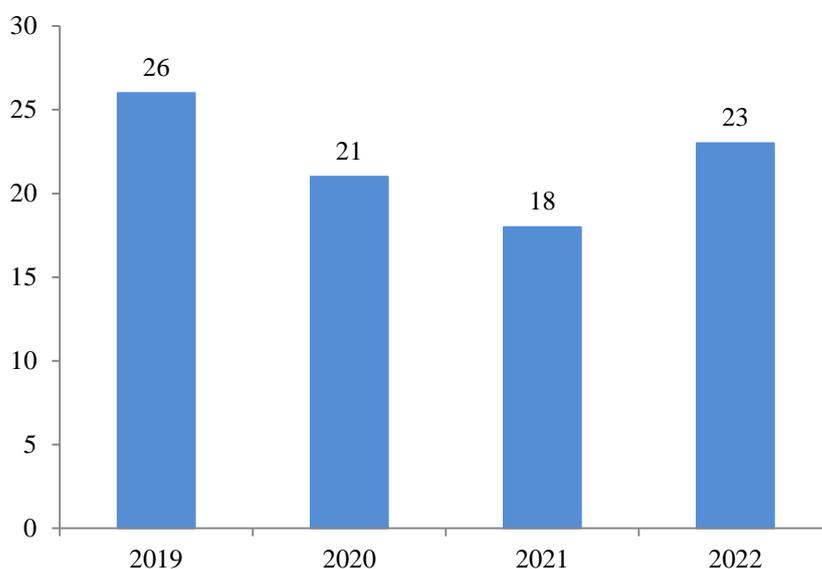


Figure 1: Bar chart showing the total species richness within site boundary from 2019 to 2022 (Actual quantity annotated at the top of each bar)

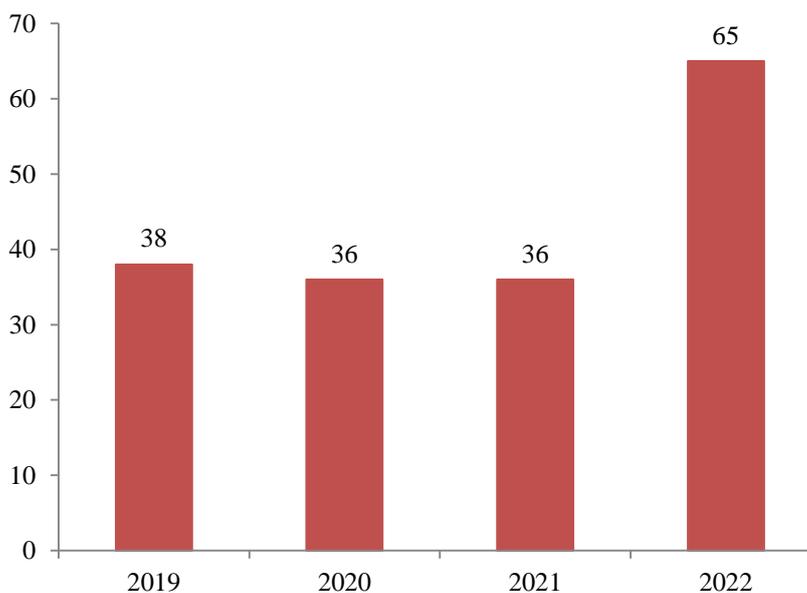


Figure 2: Bar chart showing the total abundance within site boundary from 2019 to 2022 (Actual quantity annotated at the top of each bar)

5.2 As results in section 4 were categorized by taxa, a detailed breakdown of each taxon is shown in figure 3 to further investigate the trend of specific taxa over contract period.

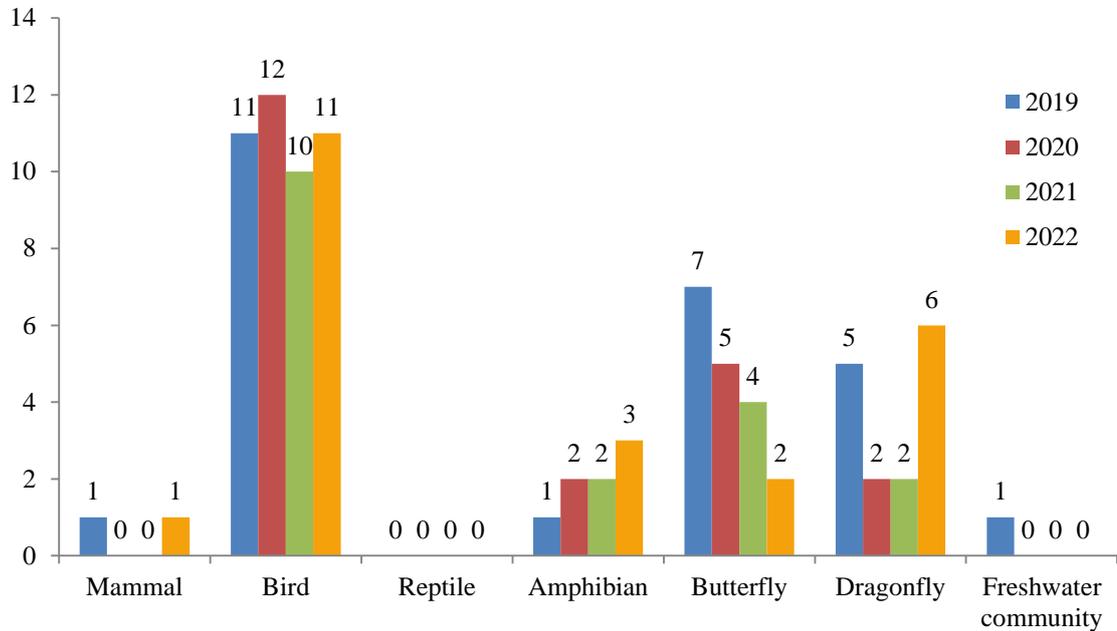


Figure 3: Bar chart showing the species richness within site boundary by taxa from 2019 to 2022
 (Actual quantity annotated at the top of each bar)

5.3 According to EM&A Manual, monitoring measures was determined by the species diversity of types of sensitive habitats, i.e. non-wetland and wetland habitats. Abundance and species richness by habitat type in June over years were compared in Figures 4 and 5.

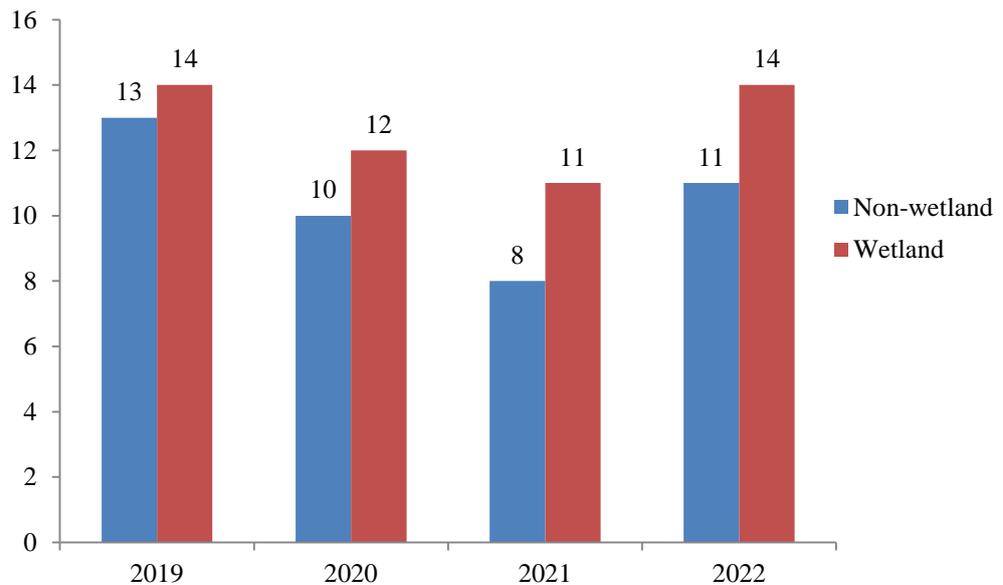


Figure 4: bar chart showing the species richness based on habitat type from 2019 to 2022
 (Actual quantity annotated at the top of each bar)

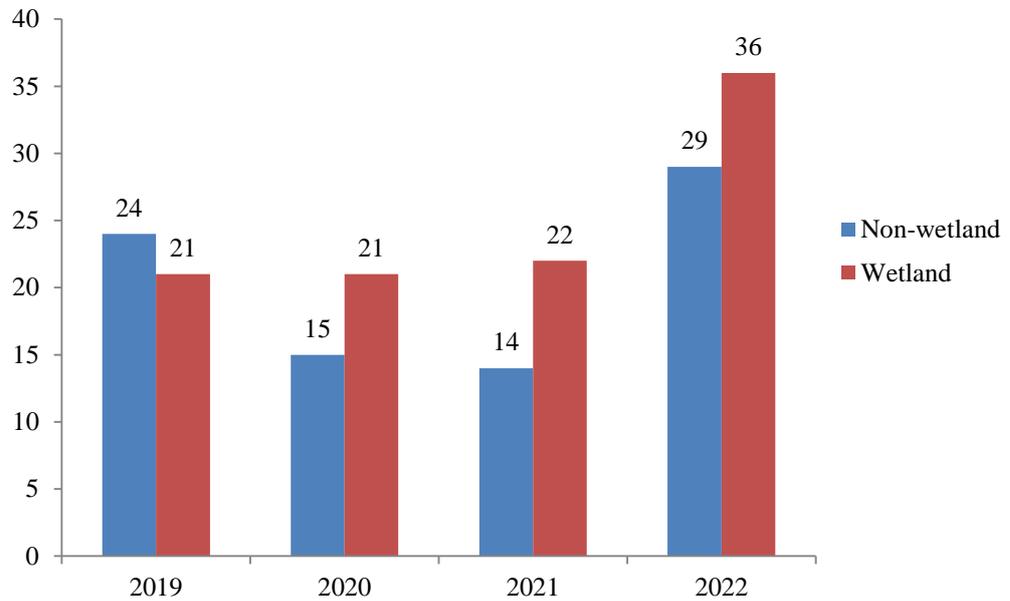
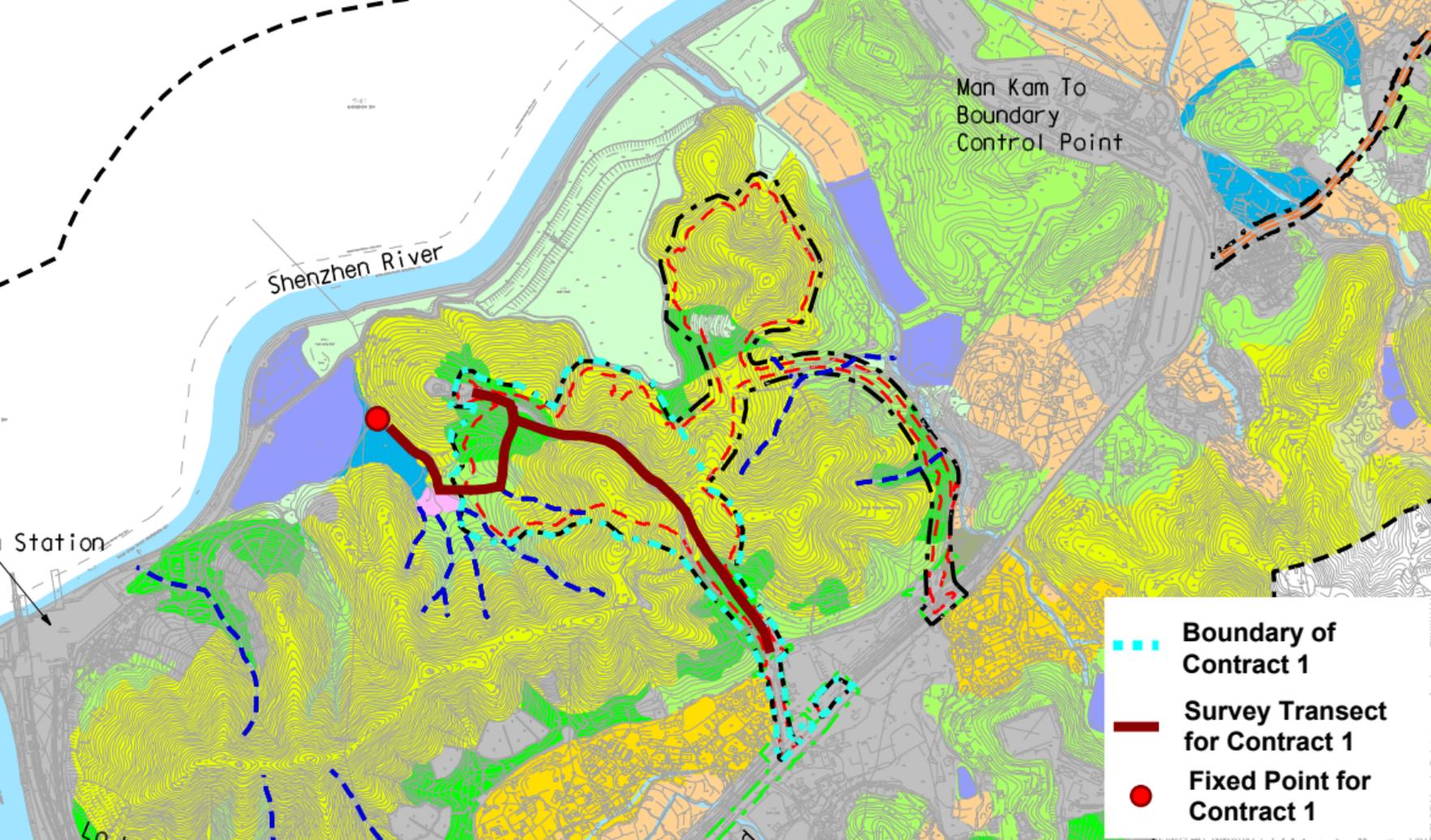


Figure 5: bar chart showing the abundance based on habitat type from 2019 to 2022
(Actual quantity annotated at the top of each bar)

5.4 After analysing survey results in June from 2019 to 2022, there was no significant drop in species richness and abundance for wetland habitat. The reduction could be due to natural fluctuation. Yet, good site practice during construction, with reference to EM&A Manual, is required to prevent or alleviate environmental impacts. For instance, the size of work areas should be minimized and disturbed areas should be reinstated immediately after completion of construction works. Unnecessary site clearance should be avoided as well. In addition, implementing proper waste disposal is necessary to reduce contamination to water and soil. Continuous monitoring is also recommended to inspect any significant decrease in species diversity.

Appendix I – Transect Routes for Contract CV/2016/10



Man Kam To
Boundary
Control Point

Shenzhen River

Station

-  Boundary of Contract 1
-  Survey Transect for Contract 1
-  Fixed Point for Contract 1

**Ecological Survey Report for
Contract CV/2017/02**

Contract No. CV/2017/02

Development of Columbarium at Sandy Ridge Cemetery – Infrastructural Works at Man Kam To Road and Lin Ma Hang Road

Monthly Report of Ecologically Sensitive Habitats Monitoring – June 2022

Revision	0	
Date of issue	28 Jun 2022	
Prepared by	Alan Lam	
Reviewed by	Rachel Siu	
Verified by	Mike Leung	

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1 INTRODUCTION

1.1 BACKGROUND

- 1.1.1 The main objective of the proposed site formation and associated infrastructural works for development of columbarium, crematorium (C&C) and related facilities at Sandy Ridge Cemetery is to increase the public cremation services and supply of public niches to meet the future demand.
- 1.1.2 The project includes site formation and associated works for development of C&C facilities at the Sandy Ridge Cemetery, road works within Sandy Ridge Cemetery, widening a section of Lin Ma Hang Road (from 6.5m to 7.3m), provision of off-site pick-up/drop-off points for shuttle buses as well as barging point at Siu Lam, Lok On Pai.
- 1.1.3 The Environmental Impact Assessment (EIA) report, including Environmental Monitoring and Audit Manual (EM&A Manual), was approved with conditions on 8 August 2016 (Register No.: AEIAR-198/2016). EPD issued an Environmental Permit (EP) for the Project (EP-534/2017) on 7 April 2017, variation of EP (EP-534/2017/A) were issued on 24 December 2018.
- 1.1.4 According to Clause 3.1 of the EP (EP-534/2017/A), “The Permit Holder shall implement the EM&A programme in accordance with the procedures and requirements as set out in the EM&A Manual. Any changes to the programme shall be justified by the ET Leader and verified by the IEC as conforming to the information and requirements contained in the EM&A Manual before submission to the Director for approval”.
- 1.1.5 This Ecologically Sensitive Habitats Monitoring Methodology articulates the protocol of monitoring the ecology of concerned habitats as specified in EM&A Manual.

1.2 OBJECTIVE

- 1.2.1 According to approved EIA report (AEIAR-198/2016), habitat types within project boundary comprise of watercourse, grassland, upland grassland, plantation, woodland and developed area. Natural habitats were of moderate ecological value in terms of species diversity, species rarity, species abundance, ecological linkage as well as nursery. Moreover, 0.3ha of wet woodland on the northern side of Sandy Ridge was deemed habitat with high ecological value. Four types of habitats were regarded as ecologically sensitive habitats, namely wet woodland, watercourses, upland grassland and woodland. Considering human disturbance in upcoming construction and operation phases, ecologically sensitive habitats shall be monitored in accordance with EM&A Manual.
- 1.2.2 The objective of ecologically sensitive habitats monitoring is to evaluate the effectiveness of measures to minimize impacts on concerned habitats from disturbance and pollution.

2 ECOLOGICALLY SENSITIVE HABITATS

2.1 DESCRIPTION OF HABITATS

- 2.1.1 In order to monitor the effectiveness of the measures to the minimise impact on ecologically sensitive habitats from disturbance and pollution, monthly monitoring during construction and operation phases is required as specified in EM&A Manual. Standard faunal transect and sampling surveys cover both wetland and non-wetland habitats:

Wetland habitats	Non-wetland habitats
Wet Woodland Watercourses	Upland Grassland Woodland

- 2.1.2 Wet woodland is small patch present on northwest of the project boundary, and is confined by the marsh area to the north and the secondary woodland to the east, south and south-west parts. A number of mature trees *Cleistocalyx nervosum* and *Acronychia pedunculata* form the tree canopy, with other self-sown shrubs (including *Psychotria asiatica*, *Ligustrum sinense* and *Glochidion lanceolarium*) and trees (*Aporosa dioica* and *Litsea monopetala*). Whilst botanically it comprises of naturally regenerated secondary woodland and ground level are a series of small braided streams and weep points which even during the dry season remain wet. This creates a rather uncommon habitat in Hong Kong offering suitable conditions for a good assemblage of common wetland species. The wet woodland provides a good assemblage of micro-habitats, which is relatively undisturbed and has good linkages to other natural habitats. Several species of conservation importance were recorded in EIA report from this habitat: East Asian Porcupine, Leopard Cat, Red Muntjac, Two-striped Grass Frog, Small Snakehead, *Somaniathelphusa zanklon*, Dancing Shadow-emerald.
- 2.1.3 Seasonal watercourse running west to east in the eastern part of the area inside the Project boundary is shallower in gradient than those running off the hillside. This seasonal watercourse is heavily vegetated with wetland-associated herbs including *Commelina diffusa*, *Polygonum chinense*, *Colocasia esculenta* and *Dracaena sanderiana*. A mature tree of *Aquilaria sinensis* was recorded at the bank of the seasonal watercourse to the west of the Sandy Ridge Cemetery Office. Seasonal watercourses are restricted to the steeper slopes within the project boundary and are characterised by being entirely dry for much of the dry season. However, endemic crab *S. zanklon* population is supported by ephemeral watercourses close to the project boundary.
- 2.1.4 Upland grassland is the major habitat within the project boundary. The semi-natural habitat is dominated by typical upland grassland species: fern *Dicranopteris pedata*, grass *Neyraudia reynaudiana*, *Miscanthus floridulus*, climbing vines *Smilax china*, *Smilax glabra*, and shrubs such as *Rhodomyrtus tomentosa*, *Breynia fruticosa* and *Helicteres angustifolia*. Approximately 30 flowering spikes of two orchid species Bamboo Orchid and Toothed Habenaria were recorded near the hill top in the northern part of this upland grassland. Golden-headed Cisticola, which is considered as Local Concern by Fellowes *et al.* (2002), was also recorded in upland grassland on Sandy Ridge, including a proved breeding record of fledged young in September 2013. In addition, numerous species of conservation interest were recorded in EIA report, such as East Asian Porcupine, Leopard Cat, Red Muntjac, Great Swift, Tamil Grass Dart, Small Three-ring and Small Grass Yellow.

2.1.5 Scattered patches of woodland are present throughout the assessment area, with the largest contiguous block located immediately to the east of the project boundary. These woodlands are relatively young with single-layered of canopy dominants (~10 – 15m tall) including *A. dioica*, *Bridelia tomentosa*, *Cinnamomum burmannii*, *Daphniphyllum calycinum*, *Litsea glutinosa*, *Rhus succedanea*, and *Zanthoxylum avicennae*. Such areas comprise secondary woodland which is largely derived from natural regeneration and colonisation of trees as a result of seed dispersal by birds and/or bats. A mature tree of *A. sinensis* is located at the woodland edge at the central part of the Project according to EIA report.

2.2 MONITORING MEASURES OF WETLAND HABITATS

2.2.1 Wetland habitats include wet woodland and watercourses. Monitoring surveys using standardised quantitative methodology will be conducted at fixed points. For seasonal watercourse, survey shall be conducted whenever the habitat appears.

2.2.2 Measures to respond to decreases in numbers of aquatic fauna using the wetland habitats and action and limit levels to trigger these measures are detailed in Table 1.

Action Level	Response	Limit Level	Response
Reduction in taxa diversity by 30%	Investigate cause and if cause identified as related to the project instigate remedial action to remove or reduce source of disturbance.	Reduction in taxa diversity by 50%	Investigate cause and if cause identified as related to the project instigate remedial action.

Table 1 Action and Limit Levels and Responses to Evidence of Declines in Aquatic Fauna

2.3 MONITORING MEASURES OF NON-WETLAND HABITATS

2.3.1 Non-wetland habitats consist of upland grassland and woodland. Monthly quantitative surveys of non-aquatic fauna will be conducted using standard route transect counts.

2.3.2 Measures to respond to decreases in numbers of non-aquatic fauna using the non-wetland habitats and action and limit levels to trigger these measures are detailed in Table 2.

Action Level	Response	Limit Level	Response
Reduction in species diversity by 30%	Investigate cause and if cause identified as related to the project instigate remedial action to remove or reduce source of disturbance.	Reduction in species diversity by 50%	Investigate cause and if cause identified as related to the project instigate remedial action.

Table 2 Action and Limit Levels and Responses to Evidence of Declines in Non-Aquatic Fauna

3 METHODOLOGY

The ecological survey includes all taxa being investigated in EIA report. Table 3 summarizes schedule of faunal surveys.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mammals	√	√	√	√	√	√	√	√	√	√	√	√
Birds (day)	√	√	√	√	√	√	√	√	√	√	√	√
Birds (night)				√	√	√	√	√	√	√		
Herpetofauna				√	√	√	√	√	√	√		
Dragonflies			√	√	√	√	√	√	√	√		
Butterflies			√	√	√	√	√	√	√	√		
Aquatic fauna	√	√	√	√	√	√	√	√	√	√	√	√

Table 3 Survey Schedule

3.1 MAMMAL SURVEY

3.1.1 Mammal surveys will be conducted along the transects shown in Appendix 1 during both daytime and night time periods. Along with direct observations, other field signs, such as scats and tracks, will be searched and recorded if present.

3.2 BIRD SURVEY

3.2.1 Bird surveys will be conducted along the transects shown in Appendix 1 during the surveys, species and their vocalizing individuals recorded will be enumerated and recorded according to the habitat(s) they are utilising.

3.3 HERPETOFAUNA SURVEY

3.3.1 Reptile and amphibian surveys will be conducted along transects shown in Appendix 1 during surveys careful searches of appropriate microhabitats and refugia for reptiles and their vocalizing individuals will be undertaken and all reptiles observed will be identified and counted.

3.4 DRAGONFLY SURVEY

3.4.1 Dragonfly surveys will be conducted along transects shown in Appendix 1 during surveys all dragonflies seen will be identified and counted as accurately as possible.

3.5 BUTTERFLY SURVEY

- 3.5.1 Butterfly surveys will be conducted along transects shown in Appendix 1 during surveys all butterflies seen will be identified and counted as accurately as possible.

3.6 AQUATIC FAUNA SURVEY

- 3.6.1 Freshwater fishes and macro-invertebrates will be recorded by direct observation. All species trapped/recorded will be enumerated and identified (to the lowest taxonomic level possible), and the species of conservation importance photographed.

4 RESULT

This monitoring survey started on 14th June 2022, a sunny day. The day and night survey covered wetland and non-wetland areas. The survey was conducted by transect and at fixed point. All species seen will be identified and counted as accurately as possible.

■ Mammal

There was no mammal recorded in the monitoring area.

■ Bird

There were total of 16 bird individuals from 7 species recorded in the monitoring area. No Golden-headed Cisticola was observed during the bird survey. Three species of conservation interests were recorded in this survey: Chinese Pond Heron (*Ardeola bacchus*) 池鷺, Black Kite (*Milvus migrans*) 黑鳶 and Greater Coucal (*Centropus sinensis*) 褐翅鴉鵂.

■ Herpetofauna

There was no reptile recorded in the monitoring area.

There were 2 amphibian species recorded in the monitoring area.

■ Butterfly

There was a total of 1 butterfly individual from 1 species recorded in the monitoring area.

■ Dragonfly

There were a total of 2 odonate from 1 species recorded in the monitoring area.

■ Freshwater communities

There were 2 species of freshwater fish recorded in the monitoring area.

Picture 1

Watercourse in monitoring area.



Picture 2

Watercourse in monitoring area.



Table 4 Result of mammal in survey

Scientific Name	Common Name	Chinese Name	Conservation Status	14/06/2022				
				UG	WL	MA	WW	WC
N/A								

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse

Table 5 Result of Avifauna in survey

Scientific Name	Common Name	Chinese Name	Conservation Status	14/06/2022				
				UG	WL	MA	WW	WC
<i>Ardeola bacchus</i>	Chinese Pond Heron	池鷺	Fellowes et al. (2002): PRC,(RC)			1		
<i>Milvus migrans</i>	Black Kite	黑鳶	Fellowes et al. (2002): (RC); Appendix 2 of CITES	1				
<i>Centropus sinensis</i>	Greater Coucal	褐翅鴉鵂	Class 2 Protected Animal of China;China Red Data Book Status: (Vulnerable)	1				
<i>Urocissa erythroryncha</i>	Red-billed Blue Magpie	紅嘴藍鵲			2			
<i>Pycnonotus jocosus</i>	Red-whiskered Bulbul	紅耳鶇			4			
<i>Prinia flaviventris</i>	Yellow-bellied Prinia	黃腹鷦鶯		2				
<i>Garrulax perspicillatus</i>	Masked Laughingthrush	黑臉噪鶇		5				

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse

Table 6 Result of reptile in survey

Scientific Name	Common Name	Chinese Name	Conservation Status	14/06/2022				
				UG	WL	MA	WW	WC
N/A								

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse

Table 7 Result of amphibian in survey

Scientific Name	Common Name	Chinese Name	Conservation Status	14/06/2022				
				UG	WL	MA	WW	WC
<i>Fejervarya limnocharis</i>	Paddy Frog	澤蛙				+		
<i>Polypedates megacephalus</i>	Brown Tree Frog	斑腿泛樹蛙				+		

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse
 + Species appeared but uncountable

Table 8 Result of butterfly in survey

Scientific Name	Common Name	Chinese Name	Conservation Status	14/06/2022				
				UG	WL	MA	WW	WC
<i>Papilio helenus</i>	Red Helen	玉斑鳳蝶			1			

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse

Table 9 Result of Odonate in survey

Scientific Name	Common Name	Chinese Name	Conservation Status	14/06/2022				
				UG	WL	MA	WW	WC
<i>Copera marginipes</i>	Yellow Featherlegs	黃狹扇蟴				2		

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse

Table 10 Result of freshwater communities in survey

Scientific Name	Common Name	Chinese Name	Conservation Status	14/06/2022				
				UG	WL	MA	WW	WC
<i>Gambusia affinis</i>	Mosquito fish	食蚊魚						+
<i>Puntius semifasciolatus</i>	Chinese Barb	五線無鬚鯪						+

*UG: Upland Grassland | WL: Woodland | MA: Marsh | WW: Wet Woodland | WC: Watercourse
 + Species appeared but uncountable

5 DISCUSSION

Data analysis was carried out to compare with the biodiversity within the site boundary in the same month over years. General description of the ecological conditions is first revealed in terms of abundance as well as species richness, following by statistical analysis of the existing database. The result is considered as significant whenever the drop of diversity indexes exceeds the percentages mentioned in previous sections 2.2 and 2.3.

5.1 Total abundance and species richness in June over years were compared to show the trends. Figures 1 and 2 indicate total species richness and total abundance within the site boundary respectively.

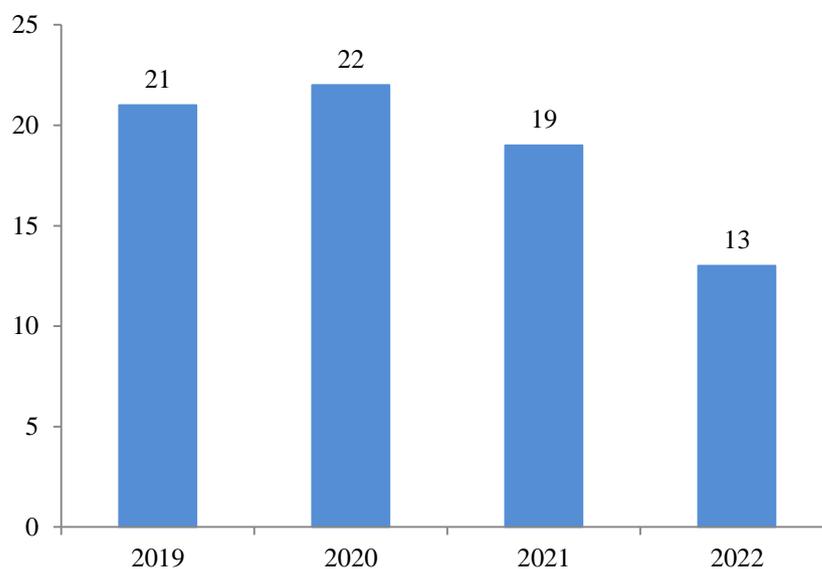


Figure 1: Bar chart showing the total species richness within site boundary from 2019 to 2022 (Actual quantity annotated at the top of each bar)

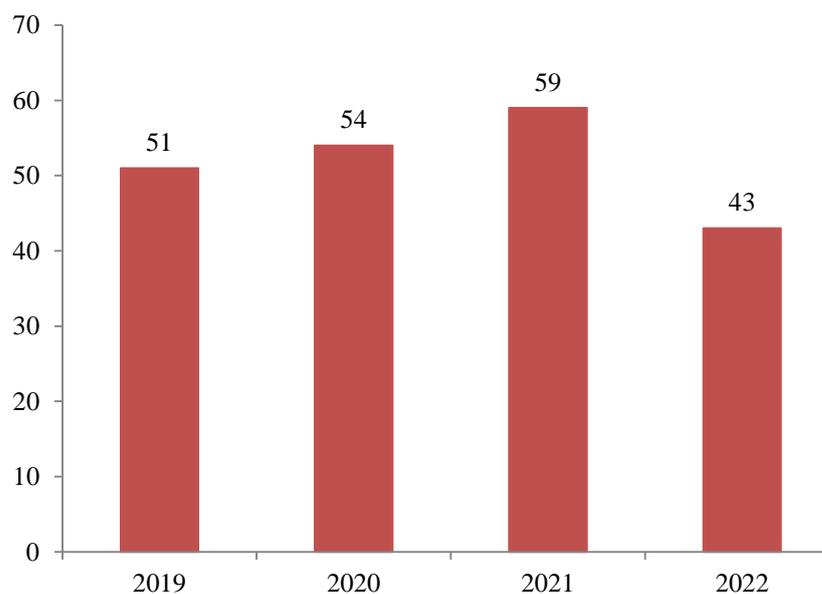


Figure 2: Bar chart showing the total abundance within site boundary from 2019 to 2022 (Actual quantity annotated at the top of each bar)

5.2 As results in section 4 were categorized by taxa, a detailed breakdown of each taxon is shown in figure 3 to further investigate the trend of specific taxa over contract period.

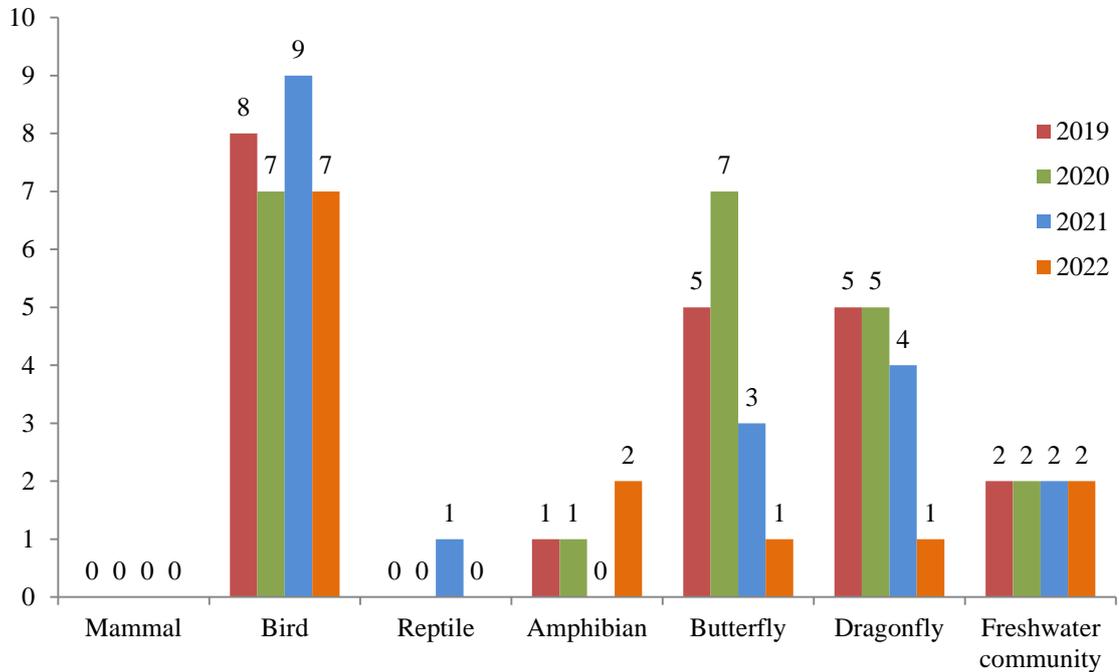


Figure 3: Bar chart showing the species richness within site boundary by taxa from 2019 to 2022 (Actual quantity annotated at the top of each bar)

5.3 According to EM&A Manual, monitoring measures was determined by the species diversity of types of sensitive habitats, i.e. non-wetland and wetland habitats. Abundance and species richness by habitat type in June over years were compared in figures 4 and 5.

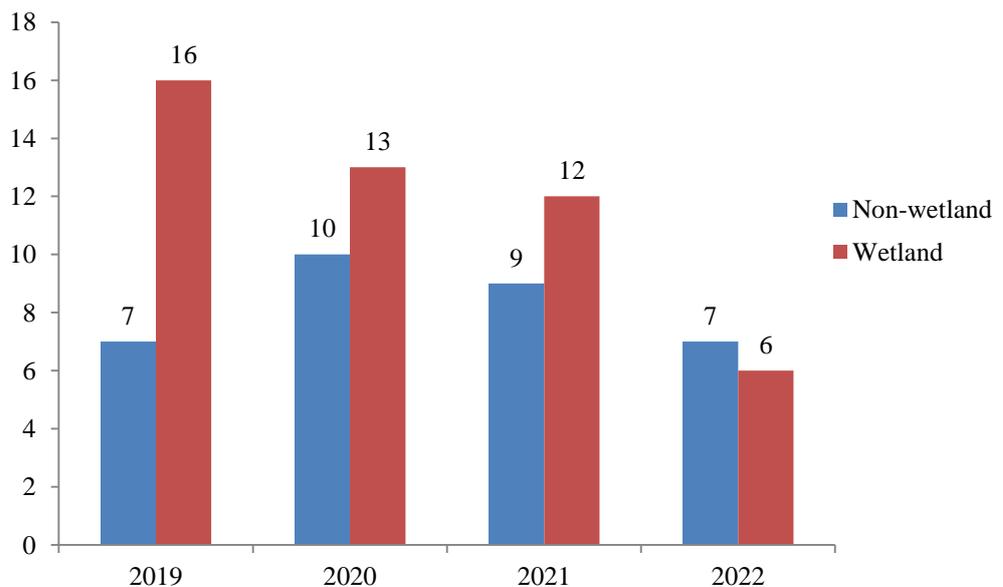


Figure 4: bar chart showing the species richness based on habitat type from 2019 to 2022 (Actual quantity annotated at the top of each bar)

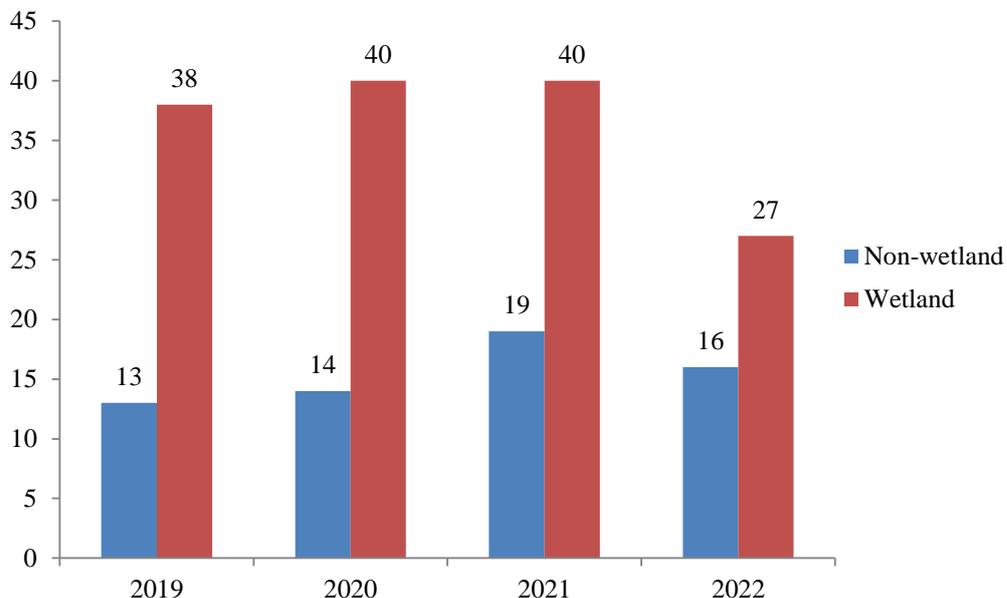
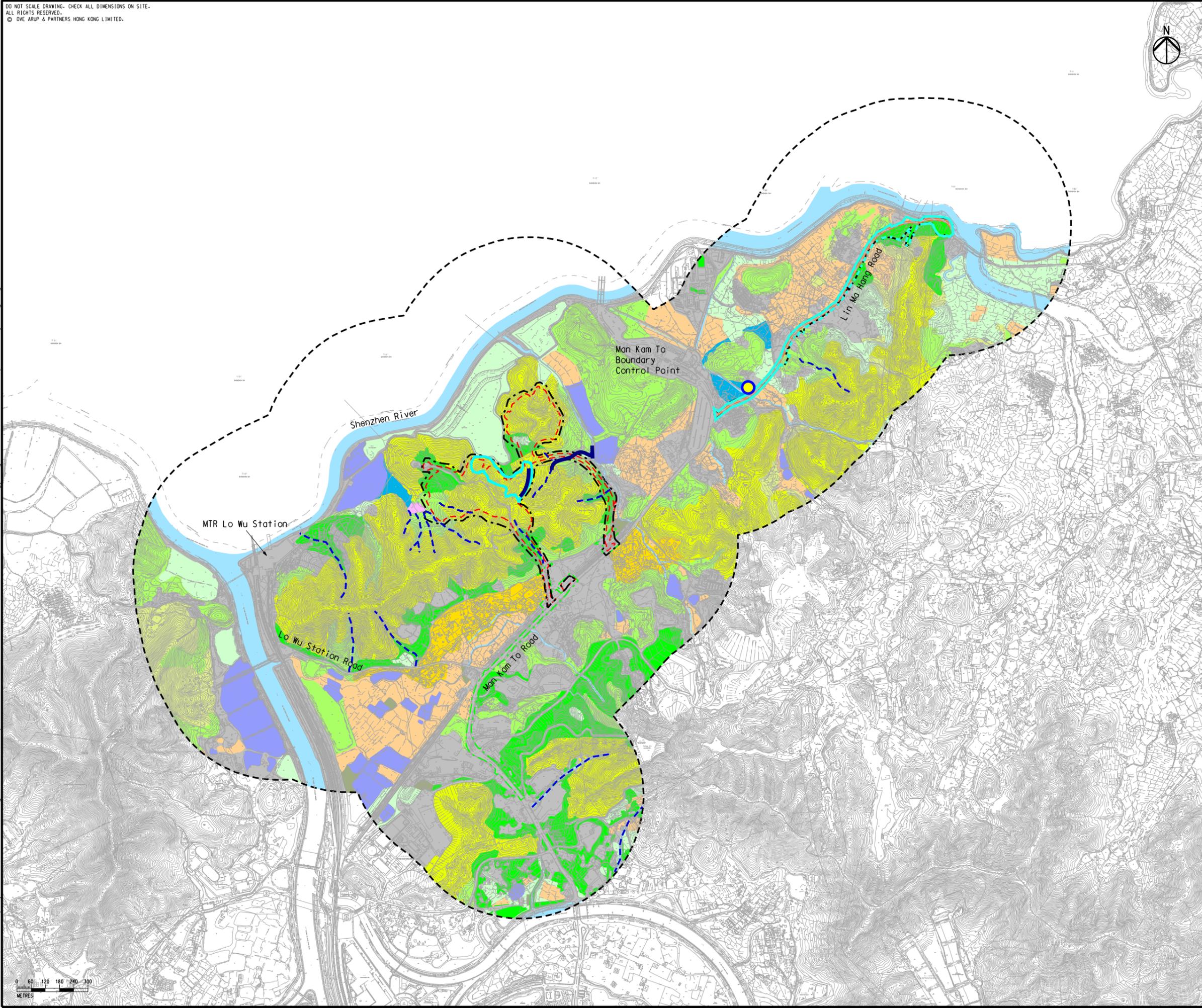


Figure 5: bar chart showing the abundance based on habitat type from 2019 to 2022
(Actual quantity annotated at the top of each bar)

5.4 After analysing survey results in June from 2019 to 2022, there was a decrease in species richness and abundance for wetland and non-wetland habitats. Still, a good site practice during construction, with reference to EM&A Manual, is required to prevent or alleviate environmental impacts. For instance, the size of work areas should be minimized and disturbed areas should be reinstated immediately after completion of construction works. Unnecessary site clearance should be avoided as well. In addition, implementing proper waste disposal is necessary to reduce contamination to water and soil. Continuous monitoring is also recommended to inspect any significant decrease in species diversity.

Appendix I – Transect Routes for Contract CV/2017/02



Legend

- Project Boundary
- Utilities Construction
- Sandy Ridge Works Area
- Lin Ma Hang Road Works Area
- 500m Assessment Area
- Watercourse
- Seasonal Watercourse
- Pond
- Developed Area
- Agricultural Land
- Marsh
- Wasteland
- Grassland
- Upland Grassland
- Shrubland
- Plantation
- Woodland
- Wet Woodland
- Village Area
- Site boundary of Contract 2
- Survey Transect for Contract 2
- Fixed Point for Contract 2

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E	FIFTH ISSUE	GL	12/15
D	FOURTH ISSUE	GL	10/15
Rev	Description	By	Date

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ARUP

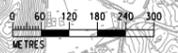
Contract No. and Title:
 Agreement No. CE 1/2013(CE)
 Site Formation and Associated
 Infrastructural Works for Development
 of Columbarium, Crematorium and
 Related Facilities at Sandy Ridge
 Cemetery - Design and Construction

Drawing title
Habitat Map at Sandy Ridge

Drawing no. Figure 9.4b		Rev. G	
Drawn GL	Date 02/16	Checked EL	Approved ST
Scale AS SHOWN		Status PRELIMINARY	

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 Civil Engineering and
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Appendix L

Landscape & Visual Inspection Checklist

Contract No. CV/2016/10

Site Formation and Associated Infrastructural Works for Development of Columbarium, Crematorium and Related Facilities at Sandy Ridge Cemetery

Landscape and Visual Impact Assessment Checklist for Site Audit

Date/ Time: 28/06/2022 11:30 Weather: Fine/ Overcast/ Rain/ Windy

Item	Mitigation Measures	Implementation			Actions/ Remarks
		Yes	No	N/A	
1	Landscape and Visual				
1.1	Is the construction period become shortened?			✓	Under review.
1.2	Is the work site confined within site boundaries and without encroaching into the landscape resources offsite?	✓			
1.3	Is the site kept clean and tidy (E.g. storage of materials, location and appearance of site accommodation being well positioned)	✓			
1.4	Is the construction site screened properly by hoardings or noise barriers in visually unobstructed colours?	✓			
1.5	Is the erosion and dust control for exposed soil well performed during excavation work? (E.g. Exposed soil shall be covered or “camouflaged” and watered frequently. Areas that are expected to be left with bare soil for a long period of time should be hydro seeded and / or covered with suitable protective fabrics.)	✓			
1.6	Are the woodland, plantation and other vegetation being protected and preserved in accordance with DEVB TC(W) No. 07/2015(E.g. Set up Tree Protection Zone)?	✓			
1.7	Are the trees which are in direct conflict with the development proposal being transplanted as far as practical in accordance with and DEVB TC(W) No. 07/2015?	✓			
1.8	Are compensatory planting for trees being provided to compensate the trees felled in accordance with DEVB TC(W) No. 07/2015?			✓	Tree planting works have not yet been commenced.
1.9	Are precautionary control measures to protect natural streams and rivers from adverse impact being implemented in accordance with ETWWB TCW No. 5/2005? (E.g. Construction debris and spoil should be covered up and properly disposed)	✓			
1.10	Is light and glare control such as hooding being implemented during construction and operation to minimize light pollution and night time glare? (E.g. All security floodlights for construction sites should be equipped with adjustable shield, frosted diffusers and reflective covers)	✓			

Summary / Remarks:

Follow up actions taken by Contractor for previous comments:

N/A

New observation:

N/A

Reminders:

1. Contractor is reminded to set up TPZ of proper size and with appropriate material around retain trees according to approved method statement.
2. Contractor is reminded to prevent the construction material pile within TPZ and ensure no works is allowed within the TPZ.
3. Transplanted tree T2465 was in fair health condition with normal foliage color and density while sparse foliage and small foliage size were observed on transplanted trees T2468 and T2928, health condition was concerned, re-monitoring of the tree condition is recommended. Contractor is reminded to provide proper maintenance according to approved method statement.

Photo Record:

Fig A.



General view (1)

Fig B.



General view (2)

Fig C.



General view (3)

Fig D.



General view (4)

Fig E.



Transplanted tree (T-2465)

Fig F.



Transplanted tree (T-2468)

Fig G.



Transplanted tree (T-2928)

Contract No. CV/2017/02

Site Formation and Associated Infrastructural Works for Development of Columbarium, Crematorium and Related Facilities at Sandy Ridge Cemetery

Development of Columbarium at Sandy Ridge Cemetery –

Infrastructural Works at Man Kam To Road and Lin Ma Hang Road

Landscape and Visual Impact Assessment Checklist for Site Audit

Date/ Time: 28/06/2022 12:30 Weather: Fine/ Overcast/ Rain/ Windy

Item	Mitigation Measures	Implementation			Actions/ Remarks
		Yes	No	N/A	
1	Landscape and Visual				
1.1	Is the construction period become shortened?			✓	Under review
1.2	Is the work site confined within site boundaries and without encroaching into the landscape resources offsite?	✓			
1.3	Is the site kept clean and tidy (E.g. storage of materials, location and appearance of site accommodation being well positioned)	✓			
1.4	Is the construction site screened properly by hoardings or noise barriers in visually unobstructed colours?	✓			
1.5	Is the erosion and dust control for exposed soil well performed during excavation work? (E.g. Exposed soil shall be covered or “camouflaged” and watered frequently. Areas that are expected to be left with bare soil for a long period of time should be hydro seeded and / or covered with suitable protective fabrics.)	✓			
1.6	Are the woodland, plantation and other vegetation being protected and preserved in accordance with DEVB TC(W) No. 07/2015(E.g. Set up Tree Protection Zone)?	✓			
1.7	Are the trees which are in direct conflict with the development proposal being transplanted as far as practical in accordance with and DEVB TC(W) No. 07/2015?			✓	
1.8	Are compensatory planting for trees being provided to compensate the trees felled in accordance with DEVB TC(W) No. 07/2015?			✓	
1.9	Are precautionary control measures to protect natural streams and rivers from adverse impact being implemented in accordance with ETWWB TCW No. 5/2005? (E.g. Construction debris and spoil should be covered up and properly disposed)			✓	
1.10	Is light and glare control such as hooding being implemented during construction and operation to minimize light pollution and night time glare? (E.g. All security floodlights for construction sites should be equipped with adjustable shield, frosted diffusers and reflective covers)			✓	

Summary / Remarks:

Follow up actions taken by Contractor for previous comments:

N/A

New Observation:

N/A

Reminders:

1. Contractor is reminded to set up TPZ of proper size and with appropriate material around retain trees according to approved method statement. Contractor should prevent any construction material pile within TPZ and ensure no works is allowed within the TPZ.

Photo Record:

Fig A.



General view (1)

Fig B.



General view (2)

Fig C.



General view (3)

Fig D.



General view (4)

Signature:

Recorded by	Registered Landscape Architect	Signature	Date
Checked by	Environmental Team Leader		12 Jul 2022
	Independent Environmental Checker		14 Jul 2022



Appendix M

Monthly Summary Waste Flow Table

Monthly Summary Waste Flow Table for 2022

Department: Civil Engineering and Development Department Contract No.: CV/2016/10
 Contract Title: Site Formation and Associated Infrastructural Works for Development of Columbarium at Sandy Ridge Cemetery
 Commencement Date: 15-Dec-2017 Estimated completion Date 22-Dec-2023 Estimated Contract Sum: 780M

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
Jan	2.177	0.000	0.500	0.000	1.089	0.588	0.000	0.000	0.000	0.000	0.070
Feb	0.486	0.000	0.200	0.000	0.286	0.000	0.000	0.000	0.000	0.000	0.015
Mar	0.669	0.000	0.200	0.000	0.469	0.000	0.000	0.000	0.000	0.000	0.020
Apr	0.752	0.000	0.200	0.000	0.552	0.000	0.000	0.000	0.000	0.000	0.025
May	0.200	0.000	0.100	0.000	0.100	0.000	0.000	0.000	0.000	0.000	0.004
June	0.200	0.000	0.100	0.000	0.100	0.000	0.000	0.000	0.000	0.000	0.003
Sub-total	4.484	0.000	1.300	0.000	2.596	0.588	0.000	0.000	0.000	0.000	0.137
July											
Aug											
Sept											
Oct											
Nov											
Dec											
Total	4.484	0.000	1.300	0.000	2.596	0.588	0.000	0.000	0.000	0.000	0.137

- Notes:
- (1) The waste flow table should cover the whole construction period of the Contract.
 - (2) The original estimates of the C&D materials should be the estimates at contract commencement and should not be altered during construction.
 - (3) Inert C&D materials that are specified in the Contract to be imported for use at the Site shall be separately indicated.
 - (4) The yearly estimates of the C&D materials should be updated as appropriate taking into account the latest works programme etc.
 - (5) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - (6) Broken concrete for recycling into aggregates.

Name of Department: CEDD

Monthly Summary Waste Flow Table for 2022

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	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
	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in Litre)	(in '000kg)
JAN	401.710	0.000	0.000	0.000	401.71	0.000	0.000	0.000	0.000	0.000	13.180
FEB	639.350	0.000	0.000	0.000	639.35	0.000	0.000	0.000	0.000	0.000	5.670
MAR	140.740	0.000	0.000	0.000	140.74	0.000	0.000	0.000	0.000	0.000	12.640
APRIL	938.880	0.000	0.000	0.000	938.88	0.000	0.000	0.000	0.000	0.000	3.670
MAY	552.820	0.000	0.000	0.000	552.82	0.000	0.000	0.000	0.000	0.000	7.080
JUN	562.680	0.000	0.000	0.000	562.68	0.000	0.000	0.000	0.000	0.000	6.570
Sub Total	3236.180	0.000	0.000	0.000	3236.180	0.000	0.000	0.000	0.000	0.000	48.810
JUL											
AUG											
SEP											
OCT											
NOV											
DEC											
Total	3236.180	0.000	0.000	0.000	3236.180	0.000	0.000	0.000	0.000	0.000	48.810

Notes: * estimated quantity (pending from EPD NENT (soil) to update the actual quantity)

Name of Department: CEDD

Forecast of Total Quantities of C&D Materials to be Generated from the Contract (see Note 4)										
Total Quantity Generated	Hard Rocks and Large Broken Concrete	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported Fill	Metal	Paper / cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
0	0	0	0	0	0	0	0	0	1	0

Notes:

- (1) The performance targets are given in PS clause 6(14) above.
- (2) The waste flow table shall also include C&D materials that are specified in the Contractor to be imported for use at the Site.
- (3) Plastic refer to plastic bottles/containers, plastic sheets/foam from packaging material.
- (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature
 - Hard Rocks and Large Broken Concrete = Cannot be defined at this stage
 - Imported Fill = Estimated by the Contractor
 - Metal = Estimated by the Contractor
 - Paper/cardboard packaging = Estimated by the Contractor
 - Plastics = Estimated by the Contractor
 - Chemical Waste = Estimated by the Contractor (Spent lubricating oil, assume density 0.9kg/L)
 - Other, e.g. general refuse = Estimated by the Contractor

Appendix N

Complaint Log and

Investigation Report

Complaint Log for Contract 1

Log ref.	Date of complaint	Complaint route	Reference no.	Complaint nature	Investigation fining	Status
1	15-Apr-21	EPD	EPD Ref.: EP3/N07/RN/8770-21	Air Quality	Non-project related	Interim IR was submitted to EPD on 22 April 2021 and included in EM&A Report – Apr 2021
2	11-Feb-22	EPD	EPD Ref.: EP3/N07/RN/03921-22	Noise	Non-project related	Interim IR was submitted to EPD on 25 Feb 2022 and included in EM&A Report – Feb 2021

Complaint Log for Contract 2

Log ref.	Date of complaint	Complaint route	Reference no.	Complaint nature	Investigation fining	Status
1	4-Sep-20	EPD	EPD Ref.: EP/RN/419300	Water quality	Non-project related	Interim IR was submitted to EPD on 14 Sep 2020 Included in EM&A Report – Sep 2020
2	15-Apr-21	EPD	EPD Ref.: EP3/N07/RN/8770-21	Air Quality	Non-project related	Interim IR was submitted to EPD on 22 April 2021 and
3	11-Feb-22	EPD	EPD Ref.: EP3/N07/RN/03921-22	Noise	Non-project related	Interim IR was submitted to EPD on 25 Feb 2022 and included in EM&A Report – Feb 2021

Appendix O

Implementation Schedule for Environmental Mitigation Measures

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
	activities.						
S5.5.5.5	Adopt quiet plants during the construction of viaduct, widening of Sha Ling Road, construction of platform for crematorium and widening of Lin Ma Hang Road. The quiet plants should be made reference to the PME listed in the TM or the QPME/ other commonly used PME listed in EPD web pages or taken from BS5228: Part 1: 2009 Noise Control on Construction and Open Sites as far as possible.	Reduce the noise levels of plant items	Contractor	Works area for construction of viaduct, widening of Sha Ling Road, construction of platform for crematorium and widening of Lin Ma Hang Road	Construction phase	• Annex 5, TM-EIAO	Implemented * Quiet plants were in used.
S5.5.5.6	Install temporary noise barriers (in the form of site hoardings, approx. 2.4m high) located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings shall be properly maintained throughout the construction period.	Reduce the construction noise levels at low-level zone of NSRs through partial screening.	Contractor	All construction sites where practicable	Construction phase	Annex 5, TM-EIAO	Implemented where necessary. * Temporary noise barriers are not practicable due to site constraint.
S5.5.5.7 - S5.5.5.12	Install movable noise barriers (typical design is wooden framed barrier with a small-cantilevered upper portion of superficial density no less than 7kg/m2 on a skid footing with 25mm thick internal sound absorptive lining), acoustic mat or full enclosure, screen the noisy plants including air compressors, generators etc.	Screen the noisy plant items to be used at all construction sites	Contractor	All construction sites where practicable	Construction phase	Annex 5, TM-EIAO	Implemented where necessary. * Movable noise barriers are not practicable due to site constraint.
S5.5.5.13	Sequencing operation of construction plants where practicable.	Operate sequentially within the same work site to reduce the construction noise	Contractor	All construction sites where practicable	Construction phase	Annex 5, TM-EIAO	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
S13.2.1.1 – S13.4.1.2	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected representative noise monitoring station	Construction phase	TM-EIAO	Implemented. * 4 noise monitoring stations were Implemented.
Operational Noise (Road Traffic Noise)							
S5.6.6.4	<p>Provide a series of noise mitigation measures including absorptive noise barriers and low noise road surfacing materials along Lin Ma Hang Road and Sha Ling Road before operation of the proposed project for existing and planned representative NSRs. Locations of noise mitigation measures are stated as following:</p> <p><i>For existing representative NSRs</i></p> <ul style="list-style-type: none"> • Approx. 12m of absorptive noise barrier 2.5m above road level along Sha Ling Road (MM1); • Approx. 92m of absorptive noise barrier 2.5m above road level along Sha Ling Road (MM2); • Approx. 28m of absorptive noise barrier 3m above road level along Project Road near Sha Ling Road (MM3); • Approx. 51m of absorptive noise barrier 3m above road level along Project Road near Sha Ling Road (MM4); • Approx. 25m of absorptive noise barrier 4m above road level along Lin Ma Hang Road near San Uk Ling (MM5); • Approx. 21m of absorptive noise barrier 4m above road level along Lin Ma Hang Road near San Uk Ling (MM6); • Approx. 14m of absorptive noise barrier 4m above road level along Lin Ma Hang Road near San Uk Ling (MM7); • Approx. 18m of absorptive noise barrier 3m above road level along Lin Ma Hang Road near San Uk Ling (MM8); • Approx. 42m of absorptive noise barrier 3m above road level along temporary pullover space opposite San Uk Ling (MM9); • Approx. 93m of absorptive noise barrier 3m above road level along Lin Ma Hang Road opposite San Uk Ling (MM10); • Approx. 185m of low noise surfacing materials along Lin Ma Hang Road near San Uk Ling (MM11); • For planned representative NSRs • Approx. 36m of absorptive noise barrier 5m above road level along Lin Ma Hang Road near Muk Wu Nga Yiu (MM12); • Approx. 47m of absorptive noise barrier 5m above road level along Lin Ma Hang 	Reduce operation noise from road traffic	Contractor	Refer to Figures 5.6.9 – 5.6.13 of the EIA Report	Prior to operation of the Project for existing representative NSRs. While for barriers to protect planned representative NSRs, it should constructed before intake of planned representative NSRs.	• TM-EIAO	Shall be implemented Prior to operation of the Project.

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
	<ul style="list-style-type: none"> Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts; All fuel tanks and storage areas should be provided with locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive receivers nearby; Regular environmental audit on the construction site should be carried out in order to prevent any malpractices. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the water bodies, marsh and ponds; Adopt best management practices. 						<p>Implemented</p> <p>Implemented</p> <p>Implemented</p> <p>Implemented</p>
S6.4.4.4 – S6.4.4.5	<p><u>Sewage from workforce</u></p> <ul style="list-style-type: none"> Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance; Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project; Regular environmental audit on the construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. 	To minimise water quality from sewage effluent	Contractor	All construction sites where practicable	Construction phase	<ul style="list-style-type: none"> Water Pollution Control Ordinance TM-DSS 	<p>Implemented</p> <p>Implemented</p> <p>Implemented</p>
S6.4.4.6	<p><u>Operation of Barging Point at Siu Lam</u></p> <ul style="list-style-type: none"> All barges should be fitted with tight bottom seals to prevent leakage of materials during transport; Barges or hoppers should not be filled to a level that will cause overflow of materials or polluted water during loading or transportation; All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and Loading of barges and hoppers should be controlled to prevent splashing of material into the surrounding water. Mitigation measures for land-based activities as outlined in Section 6.4.4 should be applied to minimise water quality impacts from site runoff and open stockpile spoils at the proposed barging facilities where appropriate. 	To minimise water quality from operation of barging point at Siu Lam	Contractor	All construction sites where practicable	Construction phase	<ul style="list-style-type: none"> Water Pollution Control Ordinance TM-DSS 	<p>No Applicable.</p> <p>* Barging point at Siu Lam is not in used.</p>
Water Quality (Operational Phase)							

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
S6.5.4.1 – S6.5.4.6	<p>The following mitigation measures during operational phase are recommended:</p> <ul style="list-style-type: none"> • Sewage and wastewater discharge should be connected to foul sewerage system; • Proper drainage systems with silt traps and oil interceptors should be installed; • The design of road gullies with silt traps should be incorporated especially for the catchment leading to the existing wet woodland area located at the north of the site; • The silt traps and oil interceptors should be cleaned and maintained regularly, especially before peak seasons of the visitors in Ching Ming Festival and Chung Yeung Festival; • Energy dissipaters should be installed at the seasonally wet watercourses to reduce the magnitude of the first flush in order to minimise the erosion impact to the wet woodland. 	To minimise the road runoff, wastewater discharge and erosion of seasonal watercourse during the operational phase	Highways Department /Contractors	Whole alignment	Construction / Operational Phase	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • TM-DSS 	For Operational phase
Waste Management (Construction Waste)							
S7.3.3.8	<p><u>Construction & Demolition Material Management Plan (C&DMMP)</u></p> <ul style="list-style-type: none"> • A C&DMMP shall be submitted to the Public Fill Committee for approval in the case of C&D materials disposal exceeding 50,000m³. 	To enhance the management of construction and demolition (C&D) material including rock in public works projects	Contractor	All construction sites	Construction phase	<ul style="list-style-type: none"> • Project Administrative Handbook for Civil Engineering Works, 2012 Edition 	
S7.3.4.2	<p><u>Good Site Practice</u></p> <p>The following good site practices are recommended throughout the construction activities:</p> <ul style="list-style-type: none"> • nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; • training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; • provision of sufficient waste disposal points and regular collection for disposal; • appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; • a Waste Management Plan (WMP) should be prepared by the contractor and submitted to the Engineer for approval. 	Minimise waste generation during construction	Contractor	All construction sites	Construction phase	<ul style="list-style-type: none"> • Waste Disposal Ordinance 	<p>Implemented</p> <p>Implemented</p> <p>Implemented</p> <p>Implemented</p> <p>Implemented</p>

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
S7.3.4.3	<p><u>Waste Reduction Measures</u></p> <p>Waste reduction is best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices. The following recommendations are proposed to achieve reduction:</p> <ul style="list-style-type: none"> segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; proper storage and site practices to minimise the potential for damage and contamination of construction materials; plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste; sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete metal etc.); provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling. 	Reduce waste generation	Contractor	All construction sites	Construction phase	<ul style="list-style-type: none"> Waste Disposal Ordinance 	<p>Implemented</p> <p>Implemented</p> <p>Implemented</p> <p>Implemented</p> <p>Implemented</p>
S7.3.4.5	<p><u>Storage of Waste</u></p> <p>The following recommendation should be implemented to minimise the impacts:</p> <ul style="list-style-type: none"> non-inert C&D materials such as soil should be handled and stored well to ensure secure containment; stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; different locations should be designated to stockpile each material to enhance reuse; 	Good site practice to minimise the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction phase	<ul style="list-style-type: none"> Land (Miscellaneous Provisions) Ordinance Waste Disposal Ordinance ETWB TCW No. 19/2005 	<p>Implemented</p> <p>Implemented</p> <p>Implemented</p>
S7.3.4.6	<p><u>Collection and Transportation of Waste</u></p> <p>The following recommendation should be implemented to minimise the impacts:</p> <ul style="list-style-type: none"> remove waste in timely manner; employ the trucks with cover or enclosed containers for waste transportation; obtain relevant waste disposal permits from the appropriate authorities; and disposal of waste should be done at licensed waste disposal facilities. 	Minimise waste impacts from storage	Contractor	All construction sites	Construction phase	<ul style="list-style-type: none"> Waste Disposal Ordinance 	<p>Implemented</p> <p>Implemented</p> <p>Implemented</p> <p>Implemented</p>
S7.3.4.8 – S7.3.4.15	<p><u>Excavated and C&D Materials</u></p> <p>Wherever practicable, C&D materials should be segregated from other wastes to avoid contamination and ensure acceptability at public filling areas or reclamation sites. The following mitigation measures should be implemented in handling the excavated and C&D materials:</p> <ul style="list-style-type: none"> maintain temporary stockpiles and reuse excavated fill material for backfilling; carry out on-site sorting; make provisions in the Contract documents to allow and promote the 	Minimise waste impacts from excavated and C&D materials	Contractor	All construction sites	Construction phase	<ul style="list-style-type: none"> Land (Miscellaneous Provisions) Ordinance Waste Disposal Ordinance 	<p>Implemented</p> <p>Implemented</p> <p>Implemented</p>

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
	<ul style="list-style-type: none"> • use of recycled aggregates where appropriate; and • implement a recording system for the amount of waste generated, recycled and disposed of for checking. • The recommended C&D materials handling should include: • On-site sorting of C&D materials; • Reuse of C&D materials; and • Use of Standard Formwork and Planning of Construction Material purchasing. 						Implemented Implemented Implemented Implemented Implemented Implemented
S7.3.4.17 – S7.3.4.18	<p><u>Chemical Waste</u></p> <p>If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producer. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste Contractor. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</p>	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction phase	<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
S7.3.4.19	<p><u>General Refuse</u></p> <ul style="list-style-type: none"> • General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling. • Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to keep areas clean. • A reputable waste collector should be employed to remove general refuse on a daily basis. 	Minimise production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction phase	<ul style="list-style-type: none"> • Waste Disposal Ordinance 	Implemented Implemented Implemented
S7.3.4.20	<p><u>Sewage</u></p> <ul style="list-style-type: none"> • The WMP should document the locations and number of portable chemical toilets depending on the number of workers, land availability, site condition and activities. • Regularly collection by licensed collectors should be arranged to minimise potential environmental impacts. 	Minimise production of sewage impacts	Contractor	All construction sites	Construction phase	<ul style="list-style-type: none"> • Waste Disposal Ordinance 	Implemented Implemented
Waste Management (Operational Waste)							
S7.4.4.1	<p><u>General Refuse</u></p> <p>A reputable waste collector should be employed to remove general refuse on a daily basis.</p>	Remove general refuse during routine road cleaning activities on the roads network and avoid odour, pest and litter impacts	Highways Department /Contractor	Roads network for the C&C facilities and Lin Ma Hang Road	Operational phase	<ul style="list-style-type: none"> • Waste Disposal Ordinance 	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
Land Contamination							
S8.9.1.1	Re-appraisal of the potentially contaminated site (SRC-1)	Identify any hot spots for SI within the southeast and western portions of SRC-1	Project Proponent / Detailed Design Consultant	Potentially contaminated site (SRC-1)	Once the works area for the Project is confirmed and site access is available (e.g. after land resumption)	<ul style="list-style-type: none"> • Annex 19 of the TM-EIAO, Guidelines for Assessment of Impact On Sites of Cultural Heritage and Other Impacts (Section 3 :Potential Contaminated Land Issues); • Guidance Manual for Use of Risk-Based Remediation Goals (RBRGs) for Contaminated Land Management; • Guidance Notes for Contaminated Land Assessment and Remediation; and • Practice Guide for Investigation and Remediation of Contaminated Land • Recommendations in Health Risk Assessment 	Implemented
S8.11.1.1	Preparation and submission of Contamination Assessment Plan (CAP) to EPD for review and approval, if required	Present the findings of the reappraisal and strategy of the recommended SI, if required	Project Proponent / Detailed Design Consultant	Potentially contaminated site (SRC-1)	After land resumption and prior to the construction phase	Ditto	Implemented
S8.11.1.2	Preparation and submission of Contamination Assessment Report (CAR) to EPD for review and approval, if required	Present the findings of SI, if any, and evaluate the level and extent of potential contamination	Project Proponent / Detailed Design Consultant	Potentially contaminated site (SRC-1)	Prior to the construction phase	Ditto	Implemented
S8.11.1.2	Preparation and submission of Remediation Action Plan (RAP) to EPD for review and approval if contamination is identified	Recommend appropriate mitigation	Project Proponent /	Potentially contaminated	Prior to the construction	Ditto	Not required as no contamination is

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
		measures for the contaminated soil and groundwater identified in the assessment if remediation is required	Detailed Design Consultant	site (SRC-1)	phase		identified.
S8.11.1.2	Preparation and submission of Remediation Report (RR) to EPD for review and approval following the completion of any necessary remediation works	Demonstrate that the decontamination work is adequate and is carried out in accordance with the endorsed CAR and RAP	Project Proponent / Detailed Design Consultant	Potentially contaminated site (SRC-1)	Prior to the construction phase	Ditto	Not required as no contamination is identified.
Ecology (Construction Phase)							
S9.7.2.3	Preparation and submission of Upland Grassland Reinstatement Plan to EPD for agreement.	An Upland Grassland Reinstatement Plan will be prepared by a qualified ecologist/botanist with full details of the findings of a baseline grassland survey, the practical details and methodology of the physical excavation, transport and storage or turves/topsoil and their subsequent reinstatement once the receptor sites have been established, along with an implementation programme of reinstatement, post-reinstatement monitoring and maintenance programme. A contingency plan	Project Proponent/ Detailed Design Consultant (qualified ecologist/ botanist) for Upland Grassland Reinstatement Plan	Engineered slopes Of Crematorium Indicative locations for Grassland Reinstatement should be referred to Figure 9.11 of the EIA Report	Prior to construction phase	<ul style="list-style-type: none"> Reinstatement and establishment requirements to be detailed in Upland Grassland Reinstatement Plan TM-EIAO 	Implemented *Upland Grassland Reinstatement Plan was submitted to EPD.

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
		<p>should be proposed in the Grassland Reinstatement Plan so as to describe the action and limit levels and the action plan if certain performance criteria (such as area of preferred habitat) are not met during the monitoring and maintenance period.</p>					
<p>S9.7.2.5 – S9.7.2.6</p>	<p>Preparation and submission of a Vegetation Survey Report and Transplantation Proposal (if needed as concluded in the Vegetation Survey Report) to EPD for agreement.</p>	<p>The Vegetation Survey will report the presence, as well as update the conditions, number, locations and habitat types of any identified floral species of conservation importance to be impacted by the development, and evaluate suitability and/or practicality of transplantation.</p> <p>The Transplantation Proposal will recommend locations of the receptor site(s), transplantation methodology, implementation programme of transplantation and post-transplantation monitoring</p>	<p>Project Proponent/ Detailed Design Consultant (qualified ecologist/ botanist) for Vegetation Survey Report and Transplantation Proposal.</p>	<p>Within the Project Area where applicable</p>	<p>Prior to construction phase</p>	<ul style="list-style-type: none"> • Survey findings and transplantation methodology to be detailed in Vegetation Survey Report and Transplantation Plan respectively. • TM-EIAO. 	<p>Implemented * Vegetation Survey Report and Transplantation Proposals for Contract 1 and Contract 2 were submitted to EPD.</p>

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
		and maintenance programme.					
S9.7.5.3 – S9.7.5.5, S9.8.1.6	Preparation and submission of Enhancement Woodland Proposal to EPD for agreement.	Recommend appropriate enhancement planting programme, planting and post-transplantation monitoring methodology, action plan for monitoring the enhancement planting and maintenance programme.	Project Proponent/ Detailed Design Consultant (qualified ecologist/ botanist) for Wooded Area Proposal.	Filled slope west of the platform, and north west of the platform in the valley below MacIntosh Fort Indicative locations for Enhancement Woodland should be referred to Figure 9.11 of the EIA Report	Prior to construction phase	<ul style="list-style-type: none"> Enhancement planting and establishment requirements to be detailed in Wooded Enhancement Proposal. TM-EIAO 	Implemented *Woodland compensation plan was submitted to EPD.
S9.7.3.1 – S9.7.3.3	<p>Indirect impacts due to potential changes in water quality, hydrology and sedimentation could occur to a series of downstream watercourses and wetland systems (including the wet woodland, marsh and mitigation ponds) during both the construction (for the Platform and LMHR widening works) and operational stages.</p> <p>Generally, indirect water impact to any aquatic fauna during the construction phase should easily be avoided by implementing water control measures (ETWB TCW No. 5/2005) to avoid direct or indirect impacts any watercourses and good site practices (further details are discussed in Section 6 of the EIA Report).</p> <p>In addition, construction phase impacts on the watercourses, riparian corridor and fauna using these areas will be minimised by erection of a 2m high, solid, dull green site boundary fence on the edge of any active works area, 30m from the watercourse. Where this is not practicable due to site constraints, demarcation fencing will need to be erected to prevent unauthorised encroachment into the riparian corridor by constructions works and traffic. Detailed mitigation measures will be designed at the detailed design stage.</p>	Minimise the indirect impacts to Water Quality and Hydrology	Contractor /detailed design consultant.	On the edge of any active works area, 30m from The watercourse	Prior to commencement and during construction phase	<ul style="list-style-type: none"> ETWB TCW No. 5/2005 TM-EIAO 	Implemented.

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
S9.7.3.4 – S9.7.3.6	<p>Mitigation for noise disturbance (details refer to S5.5.5 to S5.6.6 of this table). Site formation and construction are tentatively proposed to cover a 65-month period from mid 2017 to late 2022.</p> <p>As a precautionary approach, consideration should be given at the detailed design stage to avoid the use of highly reflective materials in the design and implementing the use of opaque materials, fritting, breaking up external reflections with stickers or plastic wrap and/or any other birdfriendly design for noise barriers.</p> <p>Works will be restricted to daytime and any construction lighting should be designed and positioned as to not impact on adjacent ecologically sensitive areas.</p>	<p>The construction work and site formation will be phased in order to reduce overall noise disturbance impacts in particular areas. Collisions usually occurs as a result of birds perceiving a clear path through an object that is transparent or appears to be transparent at some distance, or if the noise barrier is highly reflective which would appear to be composed of the adjacent natural vegetation. Furthermore, mitigation measures to control noise disturbance during this phase will involve the selection of quieter plant, use of movable noise barriers and erection of hoarding and fencing to demarcate the site boundary</p>	Contractor Project Proponent	All construction sites	Prior to commencement and during construction phase	• TM-EIAO.	
.9.7.3.7	<p>In order to demonstrate ecological awareness and to minimise the risk of indirect impacts from water pollution and hill fires, a series of good site practices should be adopted by site staff throughout the construction phase at each works site. These are as follows:</p> <ul style="list-style-type: none"> • Put up signs to alert site staff about any locations which are ecologically sensitive and measures to prevent accidental impacts; • Erection of temporary geotextile silt or sediment fences/oil traps around any earth-moving works to trap any sediments and prevent them from entering 	<p>Minimise impacts on hydrological condition and water quality of hillside watercourses and reduce chances of hillfires.</p>	Contractor	All construction sites	Prior to commencement and during construction phase	• TM-EIAO.	<p>Implemented</p> <p>Implemented</p>

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
	<p>watercourses;</p> <ul style="list-style-type: none"> Prohibition of soil storage against trees or close to waterbodies; Delineation of works site to prevent encroachment onto adjacent habitats and fence off areas which have some ecological value; No smoking, hot works or sources of fire close to upland grassland; No on-site burning of waste; and Waste and refuse in appropriate receptacles. 						<p>Implemented</p> <p>Implemented</p> <p>Implemented</p> <p>Implemented</p> <p>Implemented</p>
S.9.7.3.9	Precautionary checks by a suitably experienced ecologist of the vegetation for the presence of nesting birds should be carried out in the breeding season (February to July) before vegetation clearance. These impacts can be avoided by conducting vegetation clearance during the non-breeding season (tentatively August-January) and phased through the project period to minimise impacts.	Minimise the impacts to breeding birds within the works areas.	Contractor	All construction sites	Prior to site clearance	<ul style="list-style-type: none"> TM-EIAO WAPO 	Implemented during breeding season.
Ecology (Operational Phase)							
S9.7.2	Establishment, maintenance and monitoring of a Upland Grassland Reinstatement Area	Reinstatement of upland grassland and to maintain connectivity in Sandy Ridge.	Project Proponent/ Contractor / Maintenance Authority	Engineered slopes of Crematorium Indicative locations for Grassland Reinstatement should be referred to Figure 9.11 of the EIA Report	Operational phase	<ul style="list-style-type: none"> Monitoring methodology and successfulness of survival of upland grassland should follow Upland Grassland Reinstatement Plan. TM-EIAO. 	Upland Grassland Reinstatement Area will be implemented by other contract.
S9.7.5.3 – S9.7.5.6	Establishment, maintenance and monitoring of an enhancement woodland	Recommend appropriate enhancement planting programme, planting and post-transplantation monitoring methodology, action plan for monitoring the enhancement planting and	Project Proponent/ Detailed Design Consultant (qualified ecologist/ botanist) for Wooded Area Proposal.	Filled slope west of the platform, and north west of the platform in the valley below MacIntosh Fort	Operational phase	<ul style="list-style-type: none"> Enhancement planting and establishment requirements to be detailed in Wooded Area Proposal. TM-EIAO. 	

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
		maintenance programme.		Indicative locations for Enhancement Woodland should be referred to Figure 9.11 of the EIA Report			
S9.7.4.1 – S9.7.4.5	<p><u>Mitigation for Impacts to Water Quality and Hydrology (Operational Phase)</u></p> <ul style="list-style-type: none"> Stormwater drainage system will be further developed in detailed design stage to collect dusty materials from water collected from the platform and associated road system. Silt traps will be installed to ensure removal of dusty materials. Regular cleaning will be conducted to avoid debris entering downstream rivers during first flush; and The proposed small diameter bore pile system at the foundation of the proposed platform structure. 	<p>Specific mitigation measures will be implemented to prevent indirect impacts wetland habitats and fauna. Mitigation measures are to be further developed in the detailed design stage to address any water quality impacts due to the drainage from the proposed platform, and any erosion issues due to the drainage from the proposed platform.</p> <p>The surface runoff collected on the platform will be captured by a stormwater drainage system, which will be further developed at the detailed design stage.</p> <p>The proposed small diameter bore pile system at the foundation of the</p>	Detailed Design Consultant	Wet woodland (and further down the marsh and mitigation ponds) and the seasonal watercourse to the east of the Project boundary	Detailed Design phase/Operational phase	<ul style="list-style-type: none"> TM-EIAO 	Implemented before Operational phase

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
		proposed platform structure would allow a notional free area of about 87 – 91% for groundwater to pass through.					
S9.7.4.6 – S9.7.4.7	<p><u>Minimise the potential indirect light disturbance on the Street Lighting on fireflies surrounding the Project Site during operational phase</u></p> <ul style="list-style-type: none"> It is considered that at the detailed design stage, street lighting of similar lux/light intensity as to what is currently present is utilised. <p>Furthermore, as a precautionary measure, it is suggested that deflectors are fixed to the back of the street lights to prevent additional light reaching the marsh and causing adverse impacts to fireflies.</p>	Reduce light pollution and impact on the nearby habitats and their associated wildlife groups, particularly nocturnal fireflies.	Detailed Design/ Consultant/ Operator	The whole Project area	Detailed Design phase/Operational phase	• TM-EIAO	Implemented before Operational phase
S9.7.4.9 – S9.7.4.9	<p>The increase in visitors to the columbarium allows greater public access to the upland grassland of Sandy Ridge and in turn, the potential for hill fires is also increased. Fires may emanate from discarded cigarettes and from specific practices during festivals or grave-sweeping.</p> <p>In order to reduce the risk of hill fires, sufficient educational signage should be displayed throughout the columbarium warning people of the risks of fire and strictly prohibits practices that could cause hill fires.</p> <p>This will require input in the detailed design phase.</p>	Minimise the risk of hill fires.	Detailed Design/ Consultant/ Operator	The whole Project area	Detailed Design phase/Operational phase	• TM-EIAO	Implemented before Operational phase
Fisheries							
S10.5.1.1	No loss of fish ponds is anticipated and no <i>in situ</i> mitigation is required. However, mitigation measures for water quality (S6.4.4 – S6.5.4 in this table) proposed are also pertinent in ensuring that fisheries impacts of the Project do not occur downstream of the Project area either locally or in Inner Deep Bay.	-	-	-	-	-	Not applicable
Landscape & Visual							
S11.8.1.3 , Table 11.9	CMI – The construction area and contractor’s temporary works areas should be minimised to avoid impacts on adjacent landscape, and the reliance on off-site construction.	Minimise landscape impact and visual impact	Funded by CEDD and implemented by Contractor	Work site/ during construction	Construction phase	-	Implemented.

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
S11.8.1.3, Table 11.9	CM3 – Screening of construction works by hoardings/noise barriers around works area in visually unobtrusive colours and to screen construction works. It is proposed that screening be compatible with the surrounding environment and non-reflective, recessive colours be used. Hoarding should be taken down at the end of the construction period.	Minimise visual impact	Funded by CEDD and implemented by Contractor	Work site/ during construction	Construction phase	-	Implemented.
S11.8.1.3, Table 11.9	CM4 – Dust and Erosion Control for Exposed Soil - Excavation works and demolition of existing building blocks shall be well planned with precautions to suppress dust. Exposed soil shall be covered or watered often. Areas that are expected to be left with bare soil for a long period of time after excavation shall be properly covered with suitable protective fabric. Suitable drainage shall be provided around construction sites to avoid discharge of contaminants and sediments into sensitive water-based habitat.	Minimise indirect landscape impact	Funded by CEDD and implemented by Contractor	Work site/ during construction	Construction phase	-	Implemented.
S11.8.1.3, Table 11.9	CM5 – Control night-time lighting and glare by hooding all lights.	Minimise visual impact	Funded by CEDD and implemented by Contractor	Work site/ during construction	Construction phase	-	Implemented.
11.8.1.3, Table 11.9	CM6 – Tree Protection and Preservation – Woodland, plantation and other vegetation within the Study Area will be protected and preserved as far as possible in accordance with ETWB TCW No. 29/2004 - Registration of Old and Valuable Trees, and Guidelines for their Preservation and DEVB TCW No.07/2015 – Tree Preservation. Detailed Design Considerations are made to avoid impacts to trees, e.g. proper viaduct/ bridge design routing to avoid majority of the woodland, locating the columbarium buildings in areas with less trees and ensuring design of the buildings has as small a footprint as practical.	Minimise landscape impact and visual impact	Funded by CEDD and implemented by Contractor	Work site/ during construction	Construction phase	<ul style="list-style-type: none"> • DEVB TC(W) 07/2015 • Latest recommended horticultural practices from Greening, Landscape and Tree Management (GLTM) Section, DevB 	Implemented.
S11.8.1.3, Table 11.9	CM7 – Tree Transplantation – Tree(s) will be affected according to the Tree Preservation and Removal Proposal to be carried out in a later stage. Established trees of value are to be re-located where practically feasible.	Minimise landscape and visual impact	Funded by CEDD and implemented by Contractor	Work site/ during construction	Design and Construction phase	<ul style="list-style-type: none"> • ‘Guidelines for Tree Risk Management And Assessment Arrangement on an Area Basis and on a Tree Basis’, issued January 2011, Greening, Landscape and Tree Management 	Implemented.

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
						(GLTM) Section, DevB • Latest recommended horticultural practices from GLTM Section, DevB	
S11.8.1.3 , Table 11.9	CM8 - Implementing precautionary control measures during construction stage accordingly to ETWB TCW No. 5/2005 – Protection of natural streams/rivers from adverse impacts arising from construction works to avoid direct or indirect impacts any watercourses and good site practices.	Minimize landscape impact	Funded by CEDD and implemented by Contractor	Work site/ during construction	Design and Construction phase	• ETWB TCW No. 5/2005 – Protection of natural streams/rivers from adverse impacts arising from construction works	Implemented.
S11.8.1.3 , Table 11.9	OM1 – Compensatory Woodland Planting - The arrangement of compensatory planting (e.g. areas of woodland to be compensated and space to be allowed within the Project Site) will be subject to detailed engineering design, landscape design and planting plan, and is recommended to be implemented prior to the construction activities as far as practical.	Compensate the loss of landscape greenery and enhance the overall visual value of the site.	Funded by CEDD and implemented by Contractor	Within Project Site	Prior to Construction phase	• DEVB TC(W) 07/2015 – Tree Preservation • Latest recommended horticultural practices from Greening, Landscape and Tree Management (GLTM) Section, DevB • DEVB TCW No. 06/2015 – Maintenance of Vegetation and Hard Landscape Features	Implemented
S11.8.1.3 , Table 11.9	OM2 – Compensatory Tree Planting for Plantation and Other Vegetated Areas - Compensatory planting should be provided in accordance with DEVB TCW No. 07/2015 to compensate for those trees felled. According to the preliminary design, compensatory trees will be planted on the cut/fill slopes, along new roads and in car parks. The selection of planting species shall be made with reference to the species identified in the future Detailed Tree Survey and be native to Hong Kong or the South China region.	Compensate the loss of landscape greenery and enhance the overall visual value of the site.	Funded by CEDD and implemented by Contractor	Within Project Site	Construction phase	• DEVB TC(W) 07/2015 – Tree Preservation • Latest recommended horticultural practices from Greening, Landscape and Tree Management (GLTM) Section, DevB • DEVB TCW No. 06/2015 –	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
						Maintenance of Vegetation and Hard Landscape Features	
S11.8.1.3 , Table 11.9	OM3 – Amenity Planting and aesthetic streetscape design of hard landscaping for Pedestrian Walkway, Roadside - Roadside amenity planting should be provided along Sha Ling Road, Lin Ma Hang Road, as well as the internal road within Sandy Ridge columbarium and crematorium site; to enhance the landscape quality of the existing and proposed transport routes. Climbers are proposed to cover vertical, hard surfaces of the piers of the proposed viaducts, and also the newly formed retaining wall within the site. Shade tolerant plants will be planted, where light is sufficient, to improve aesthetic value of areas under viaducts.	Minimise visual impact and also enhance landscape.	Funded by CEDD and implemented by Contractor	Within Project Site	Construction phase	<ul style="list-style-type: none"> Guidelines on Greening of Noise Barriers, issued April 2012, GLTMS, DevB DEVB TCW No. 06/2015 – Maintenance of Vegetation and Hard Landscape Features 	Implemented
S11.8.1.3 , Table 11.9	OM4 – Greening Works and Contour Grading Works on Cut/ Fill Slopes - Greening works such as hydroseeding/ terraces of shrub or tree planting will be provided where slope gradient allows, according to Geotechnical Engineering Office (GEO) Publication No.1/2011 Technical Guidelines on Landscape Treatment for Slopes.	Minimise landscape and visual impact	Funded by CEDD and implemented by Contractor	Within Project Site	Construction phase	Geotechnical Engineering Office (GEO) Publication No.1/2011 Technical Guidelines on Landscape Treatment for Slopes.	Implemented
S11.8.1.3 , Table 11.9	OM5 – Landscape design treatment to be provided by relevant government department.	Mitigate the loss of greenery and enhance the overall landscape and visual value	Funded by FEHD and implemented by Contractor	Within Project Site	After handover to the relevant department	-	Implemented after handover to the relevant department
S11.8.1.3 , Table 11.9	OM6 – Architectural and chromatic treatment of the hard architectural and engineering structures and facilities.	Mitigate the loss of greenery and enhance the overall landscape and visual value	Funded by FEHD and implemented by Contractor	Within Project Site	After handover to the relevant department	-	Implemented after handover to the relevant department
S11.8.1.3 , Table 11.9	OM7 – Aesthetic design of the proposed noise barriers.	Mitigate the visual impact	Funded by CEDD and implemented by Contractor	Along Sha Ling Road and Lin Ma Hang Road	Construction phase	<ul style="list-style-type: none"> WBTC No. 36/2004 - ACABAS - submission is required to ACABAS for approval of any bridges and associated structures within the public highway 	Implemented

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
						system.	
S11.8.1.3 , Table 11.9	OM8 - Silt traps should also be incorporated into design of road gullies for the natural water stream(s).	Minimise the landscape impact on natural stream	Funded by CEDD and implemented by Contractor	Within Project Site	Construction Phase		Implemented

Notes:

- (a) A detailed Tree Survey Report showing all identified valuable trees and OVT will be undertaken in a separate Tree Preservation and Removal Proposal.
- (b) Wood resulting from tree removal should be recycled as mulch or soil conditioner for re-use within the Project or in other projects as far as possible e.g. for the construction of soft landscape work, were practical.
- (c) Contractor is responsible for landscaping during the agreed establishment and maintenance period. Other designated management and maintenance agents to take up maintenance and management of landscaping after end of agreed period
- (d) Highways Department (HyD) is responsible for maintenance and management of landscaping of public road side slope, Leisure and Cultural Services Department (LCSD) is responsible for the management and maintenance of soft landscapes along non-expressway public roads outside Country Park and Food and Environmental Hygiene Department (FEHD) is responsible for maintenance and management of landscaping of other areas allocated to FEHD..
- (e) The landscape mitigation treatment of the future development site shall follow the below frameworks:
 - Buffer planting shall be provided to soften the edge of the site.
 - Aesthetic landscape treatment including both soft and hard landscape features shall be provided.
 - Vertical greening shall be provided as far as practicable.
 - At-grade tree planting shall be provided as far as possible while planting space is allowed, to enhance the overall environment.
 - Architectural design shall blend in with the surrounding environment.
 - Overall greening ratio shall comply with TC(W) No.3/2012 Site coverage of Greenery for Government Building Projects.

EIA Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved	Implementation status and remark*
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The compensatory woodland planting shall be included woodland mixed whips, seeding, and shrubs. The principle of the location shall be the extension of the existing woodland, as well as the original lost woodland location. The proposal will be agreed with AFCD, the woodland enhancement planting shall refer to Chapter 9.

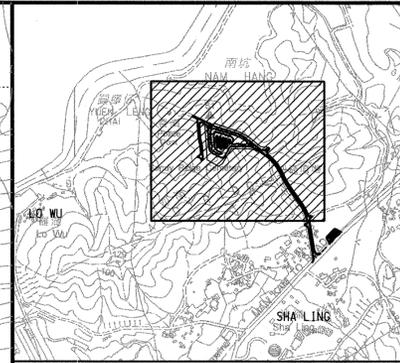
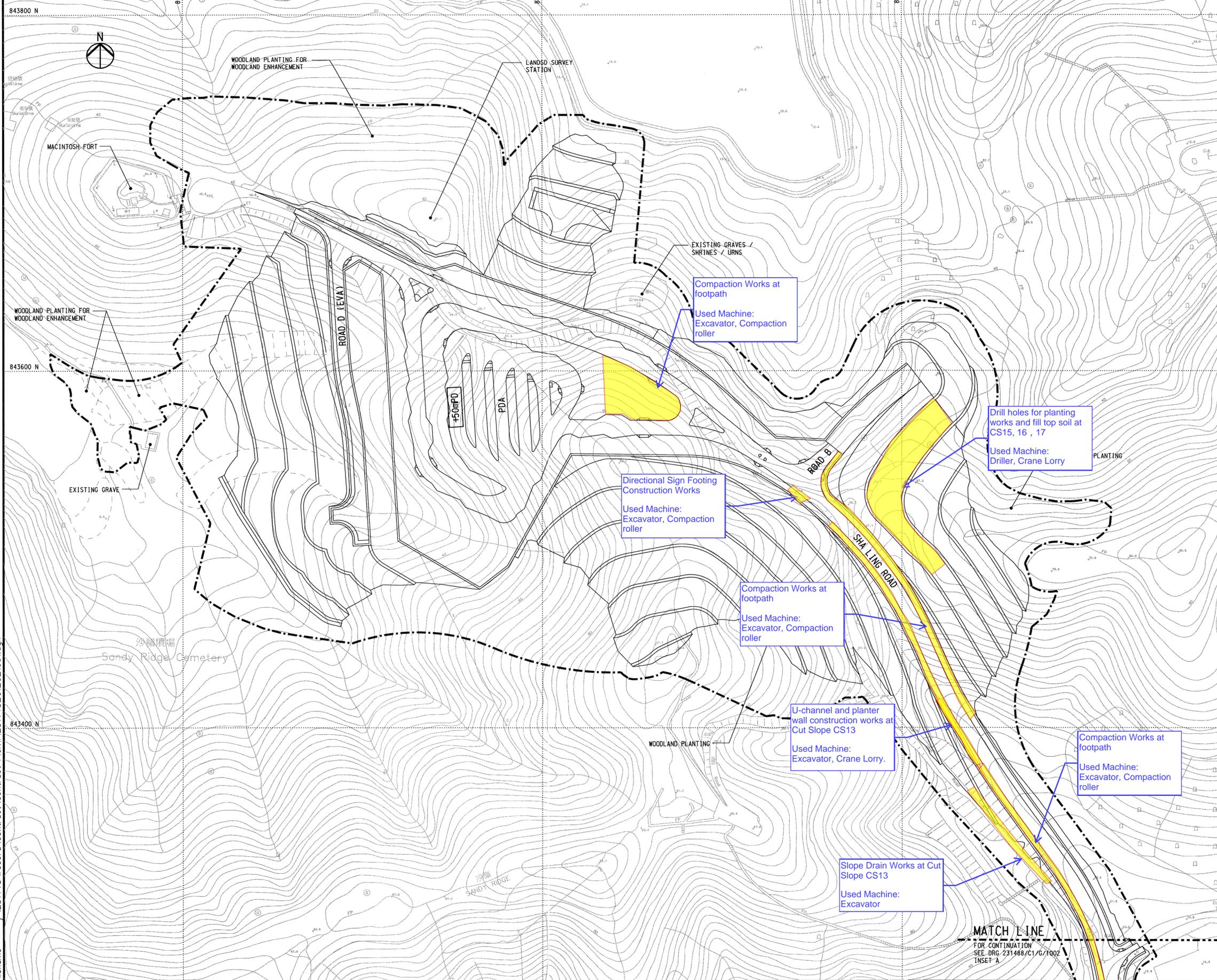
EM&A Project

S13.1.1.1 , S13.2.1.2	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	Highways Department	All construction sites	Construction phase	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO 	Implemented
S13.2.1.1 – S13.4.1.2	<ol style="list-style-type: none"> 1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with. 	Perform environmental monitoring & auditing	Highways Department / Contractor	All construction sites	Construction phase	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO 	Implemented

Appendix P

Illustrations of Site Activities

DO NOT SCALE DRAWING - CHECK ALL DIMENSIONS ON SITE.
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KEY PLAN

LEGEND:
 - - - - - PROPOSED WORKS SITE
 +50mPD SITE FORMATION LEVEL

Rev	Description	By	Date

Consultant
ARUP

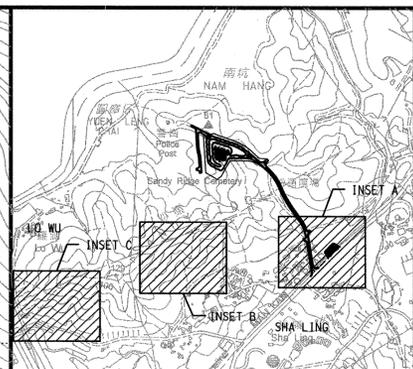
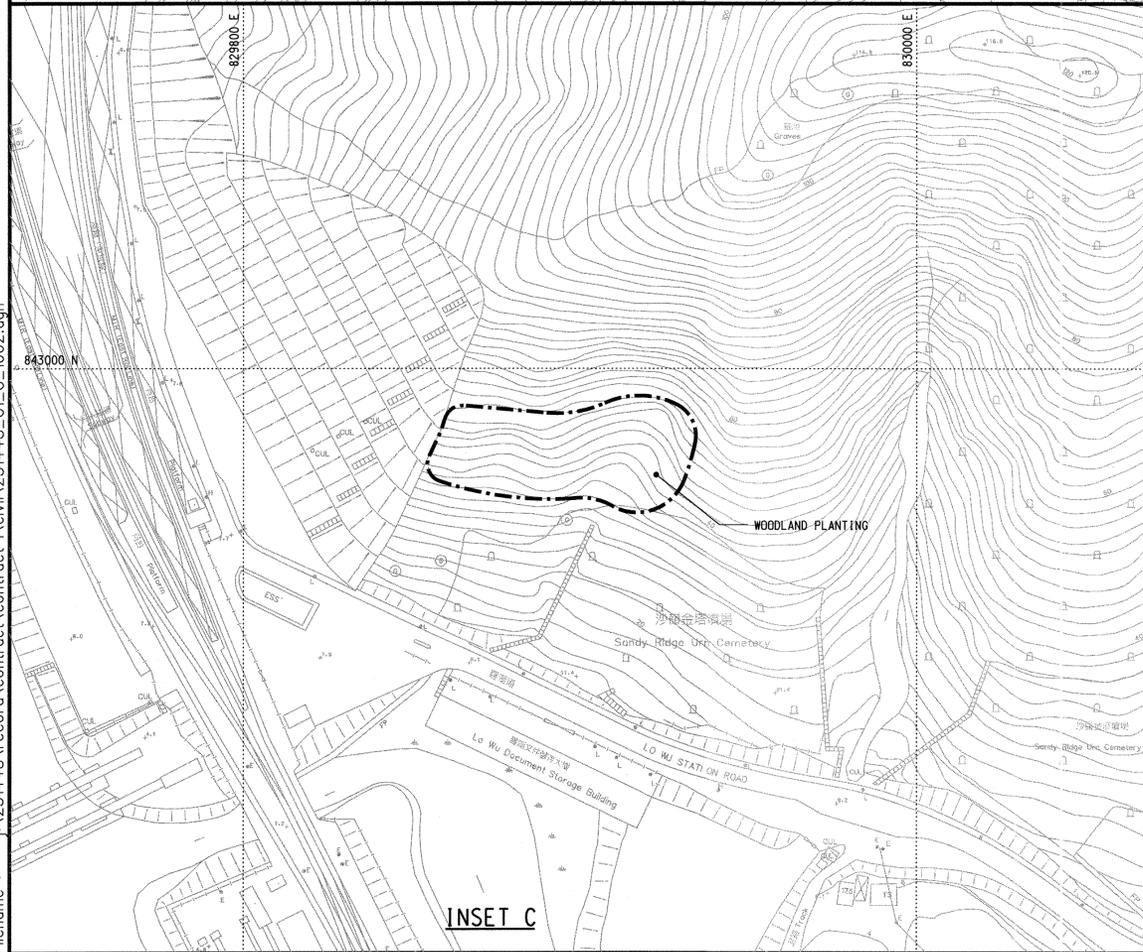
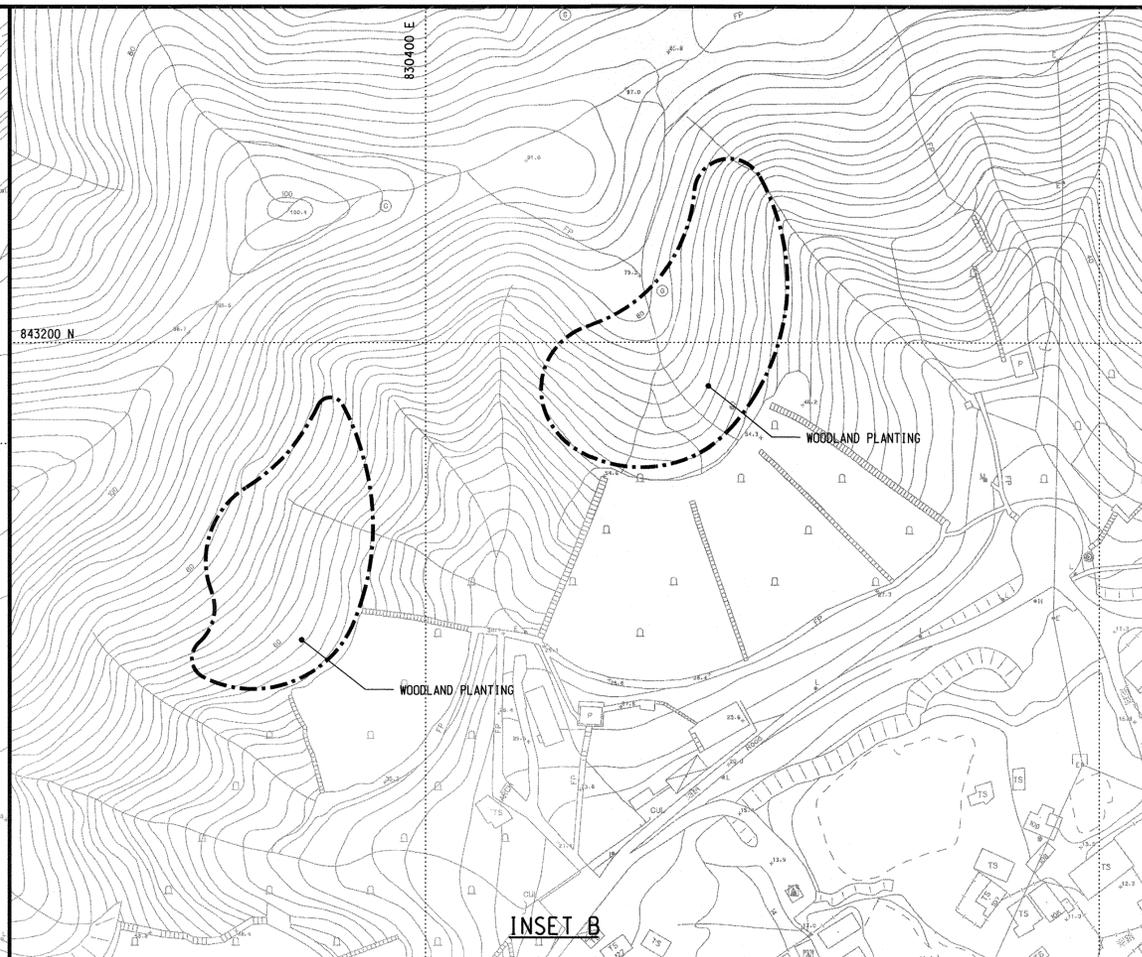
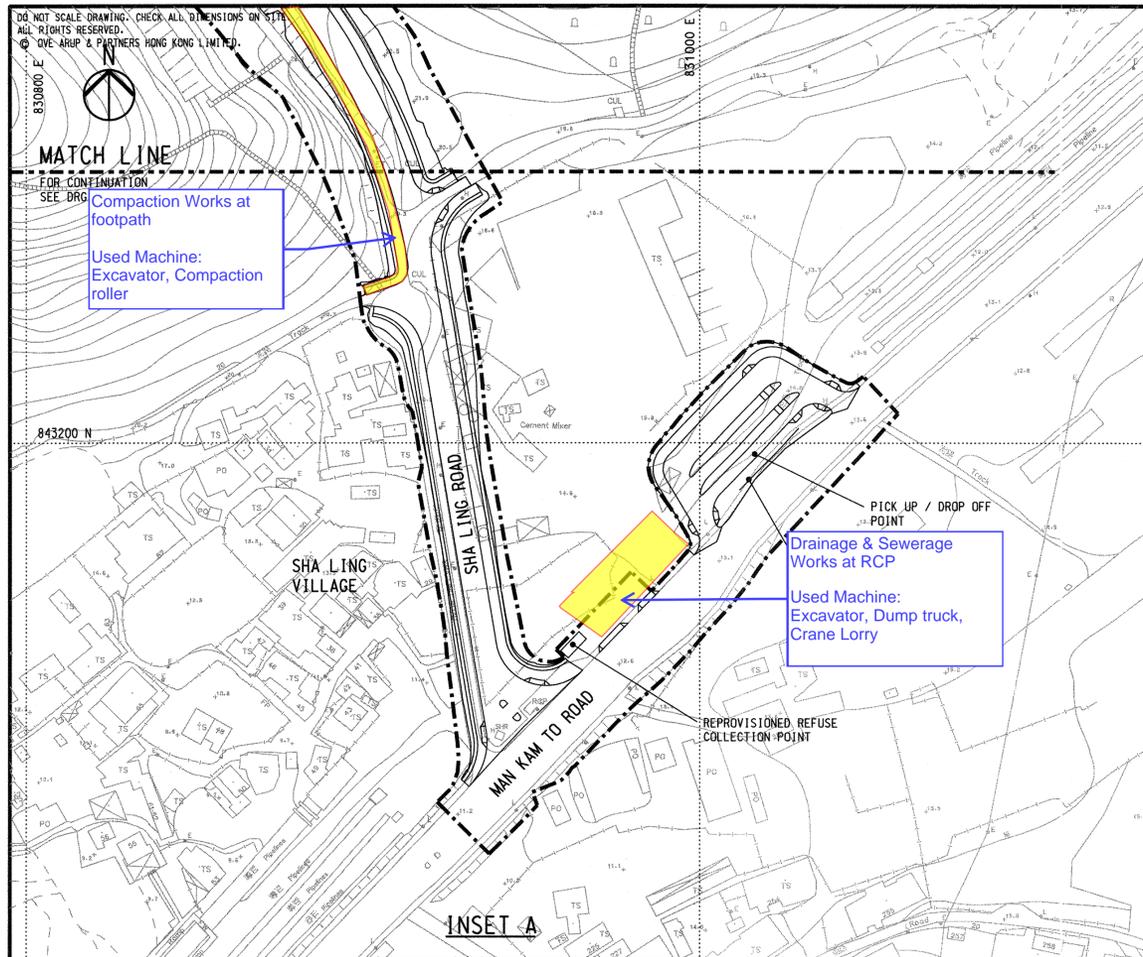
Contract No. and Title:
 Contract No. CV/2016/10
 Site Formation and Associated Infrastructural Works for Development of Columbarium at Sandy Ridge Cemetery

Drawing title
GENERAL LAYOUT (SHEET 1 OF 3)

Drawing no. 231448/C1/G/1001		Rev. -	
Drawn WM	Date 12/16	Checked AW	Approved DL
Scale 1:1000 @A1		Status CONTRACT	

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KEY PLAN

LEGEND:

--- PROPOSED WORKS SITE

Rev	Description	By	Date

Consultant
ARUP

Contract No. and Title:
Contract No. CV/2016/10
Site Formation and Associated Infrastructural Works for Development of Columbarium at Sandy Ridge Cemetery

Drawing title
GENERAL LAYOUT (SHEET 2 OF 3)

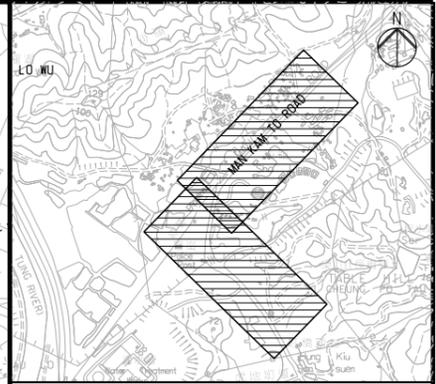
Drawing no. 231448/C1/G/1002		Rev. -	
Drawn WM	Date 12/16	Checked AW	Approved DL
Scale 1:1000 @A1	Status	CONTRACT	

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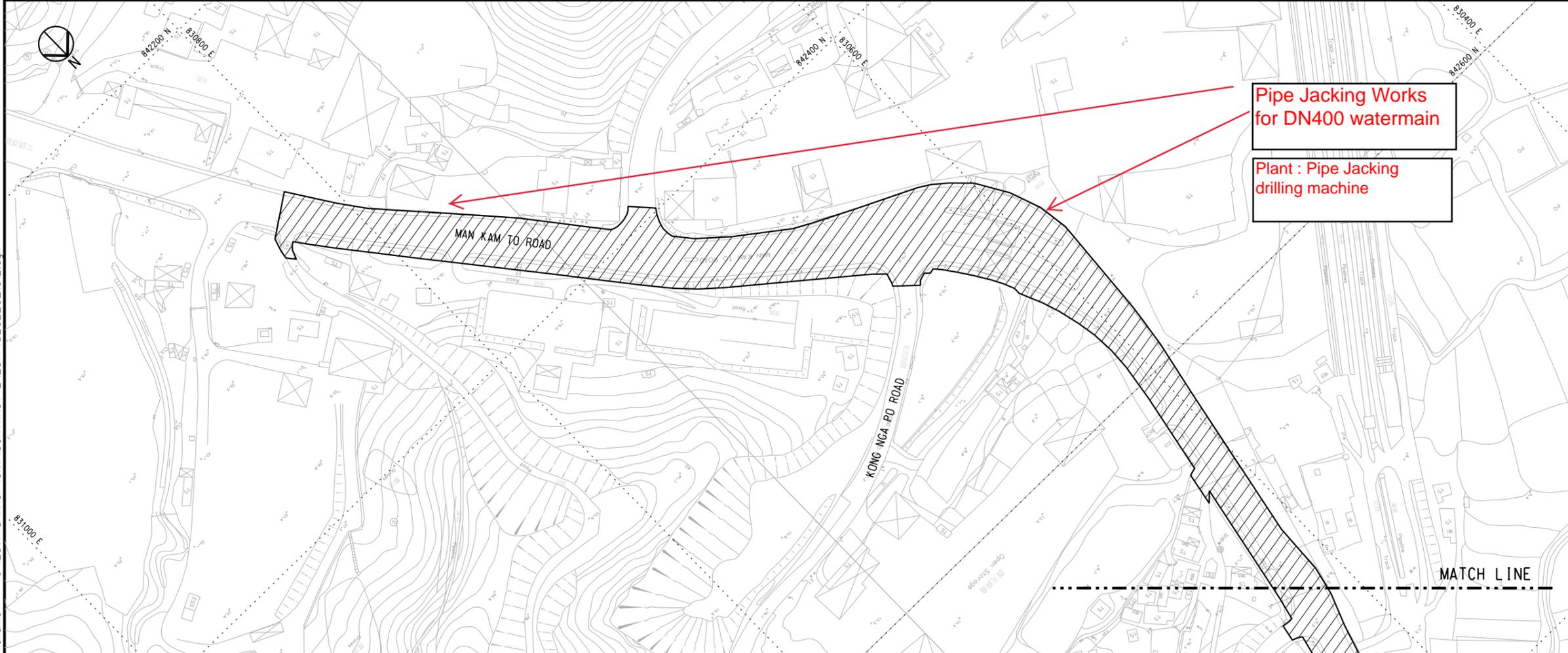


KEY PLAN

- NOTE:**
- PART(S) OF THE SITE WHICH IS/ARE LOCATED IN THE PUBLIC ROADS AND FOOTPATH SHALL ONLY BE OCCUPIED BY THE CONTRACTOR FOR THE EXECUTION OF THE WORKS WITH PRIOR APPROVAL FROM RELEVANT GOVERNMENT AUTHORITIES INCLUDING ACQUIRING EXCAVATION PERMITS ISSUED BY THE HIGHWAYS DEPARTMENT. THE CONTRACTOR SHALL BE RESPONSIBLE TO ACQUIRE APPROVAL OF HIS TEMPORARY TRAFFIC ARRANGEMENT SCHEMES AND ALL NECESSARY EXCAVATION PERMITS FROM RELEVANT AUTHORITIES.
 - THE DEMARCATION AND EXTENT OF THE PART(S) OF THE SITE AS SHOWN ARE APPROXIMATE ONLY AND SHALL BE CONFIRMED ON SITE BY THE PROJECT MANAGER / SUPERVISOR.

LEGEND:

	PART A1
	PART A2
	PART A3
	PART A4
	PART B
	PART C1
	PART C2
	PART D
	PART E



Pipe Jacking Works
for DN400 watermain

Plant : Pipe Jacking
drilling machine

- TENDER DRAWING		AW	11/17
Rev	Description	By	Date

Consultant

ARUP

Contract No. and Title:
Contract No. CV/2017/02
Development of Columbarium
at Sandy Ridge Cemetery -
Infrastructural Works at
Man Kam To Road and
Lin Ma Hang Road

Drawing title
**PART OF THE SITE
(SHEET 2 OF 5)**

Drawing no. 231448/C2/G/1012		Rev. -	
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Scale 1:1000 @A1		Status TENDER	

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844400 N



844200 N

844000 N

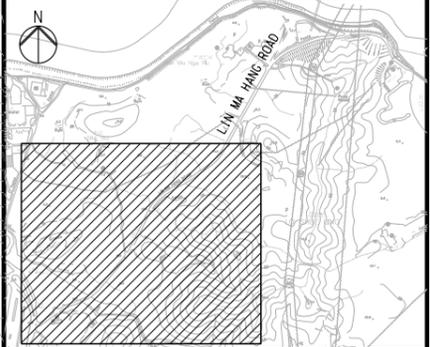
831800 E

832000 E

832200 E

MATCH LINE
FOR CONTINUATION SEE
Dwg. 231448/C2/G/104

Construction of
Manhole, gullies, drainage pipe
Plant: Excavator, dump truck,



KEY PLAN

NOTE:

- PART(S) OF THE SITE WHICH IS/ARE LOCATED IN THE PUBLIC ROADS AND FOOTPATH SHALL ONLY BE OCCUPIED BY THE CONTRACTOR FOR THE EXECUTION OF THE WORKS WITH PRIOR APPROVAL FROM RELEVANT GOVERNMENT AUTHORITIES INCLUDING ACQUIRING EXCAVATION PERMITS ISSUED BY THE HIGHWAYS DEPARTMENT. THE CONTRACTOR SHALL BE RESPONSIBLE TO ACQUIRE APPROVAL OF HIS TEMPORARY TRAFFIC ARRANGEMENT SCHEMES AND ALL NECESSARY EXCAVATION PERMITS FROM RELEVANT AUTHORITIES.
- THE DEMARCATION AND EXTENT OF THE PART(S) OF THE SITE AS SHOWN ARE APPROXIMATE ONLY AND SHALL BE CONFIRMED ON SITE BY THE PROJECT MANAGER / SUPERVISOR.

LEGEND:

- PART A1
- PART A2
- PART A3
- PART A4
- PART B
- PART C1
- PART C2
- PART D
- PART E

Rev	Description	By	Date
-	TENDER DRAWING	AW	11/17

Consultant
ARUP

Contract No. and Title:
Contract No. CV/2017/02
Development of Columbarium
at Sandy Ridge Cemetery -
Infrastructural Works at
Man Kam To Road and
Lin Ma Hang Road

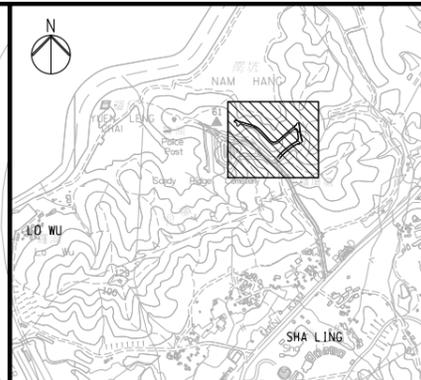
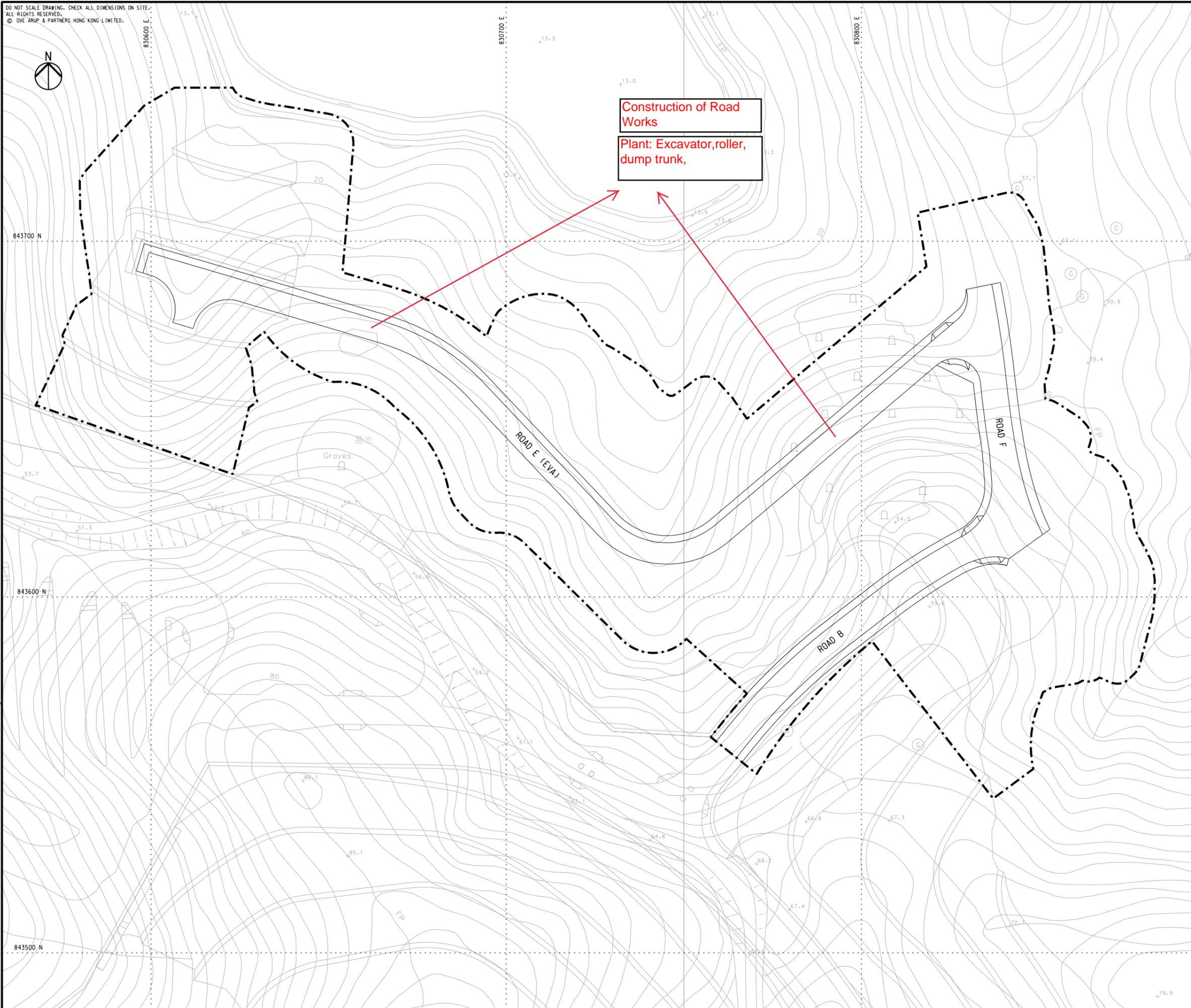
Drawing title
**PART OF THE SITE
(SHEET 3 OF 5)**

Drawing no. 231448/C2/G/1013		Rev. -	
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KEY PLAN

LEGEND:

--- SITE BOUNDARY

Rev	Description	By	Date
-	TENDER DRAWING	AW	11/17

Consultant
ARUP

Contract No. and Title:
 Contract No. CV/2017/02
 Development of Columbarium
 at Sandy Ridge Cemetery -
 Infrastructural Works at
 Man Kam To Road and
 Lin Ma Hang Road

Drawing title
**GENERAL LAYOUT
 (SHEET 1 OF 5)**

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