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.53) – DECEMBER 2022

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

Date	Reference No.	Prepared By	Certified By
13 January 2023	TCS00881/18/600/R0705v2	Nicola Hon (Environmental Consultant)	Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	10 January 2023	First Submission
2	13 January 2023	Amended according to IEC's comment on 13 January 2023

Our Ref: TCS00881/18/300/L0708

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

Attn: Mr. SHUM Ngai Hung, Steven

13 January 2023
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.53) – December 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 Contracts 1 and 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-202301020

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

13 January 2023

Dear Sir,

Site Formation and Associated Infrastructural Works for Development of Columbarium at Sandy Ridge Cemetery
Monthly Environmental Monitoring and Audit Report (No. 53) December 2022

I refer to the email of the ET on 13/01/2023 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 December 2022 (Version 2) with Ref. No. TCS00881/18/600/R0705v2.

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

EXECUTIVE SUMMARY

ES.01. This is the **53rd** Monthly Environmental Monitoring and Audit (EM&A) Report summarizing the monitoring results and inspection findings under the Project for the period from **1st** to **31st December 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 ASR-3	54
	24-hour TSP			18
Construction Noise	$L_{eq\ (30min)}$ Daytime	CN-1 CN-2	CN-3 CN-4	16
Water Quality	In-situ measurement and Water sampling	M3	M1, M2 and M4	12 (#)
Ecology	Sensitive Habitat	Transect within site area of CV/2016/10	Transect within site area of CV/2017/02	24th Dec 2022
Landscape & Visual	Site Inspection	Site area of CV/2016/10	Site area of CV/2017/02	29th Dec 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: (#) On 2 December, the channel of M2 was dried up / too shallow in the entire month and representative water sampling was unable be carried out.

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES.03. In the Reporting Month, no exceedance of air quality and water quality monitoring was recorded. No noise complaint (which triggered Action Level) was received and Limit Level exceedance for noise monitoring exceedance was recorded. The statistics of environmental exceedance, Notification 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	0	-	-
	Suspended Solids (SS)	0	0		

ES.04. Monthly ecological monitoring for sensitive habitat for area of Contract 1 and Contract 2 were undertaken on ***24th December 2022***. After analysing survey results in December from 2019 to 2022, there was no significant drop in species richness and abundance for wetland and non-wetland habitat for area of both Contract 1 and 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. 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.05. There was no precautionary check for the presence of nesting birds conducted outside the concerned breeding season (February to July).

ES.06. Landscape and visual inspection at both Contracts were undertaken on ***29th December 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.01. 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
1st – 31st December 2022	Contract 1	0	2	(1) Air Quality (1) Noise
	Contract 2	0	6	(1) Water (2) Air Quality (1) Noise (1) soil/ muddy water

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.02. 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
1st – 31st December 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
1st – 31st December 2022	Contract 1	0	0	NA
	Contract 2	0	0	NA

ES.03. In addition, no complaint and emergency event relating to violation of environmental legislation for illegal dumping and landfilling was received.

REPORTING CHANGE

ES.04. No reporting change was made in the Reporting Month.

SITE INSPECTION

ES.05. 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 , 8th, 15th, 22nd and 29th December 2022***. Moreover, joint site inspections for Contract 2 by the RE, ET and the Contractor of Contract 2 were carried out on ***1st , 8th, 15th, 22nd and 29th December 2022***. IEC attended joint site inspection for both Contracts on ***15th December 2022***. No non-compliance was noted during the site inspections.

FUTURE KEY ISSUES

ES.06. During dry season, the Contractors are reminded to pay special attention on the 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.07. Water quality mitigation measures as recommended in the EM&A Manual should be fully implemented, in particular to prevent surface runoff and other pollutants from flowing to local stream and Conservation Area.

ES.08. 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:

Designated Works under EP-534/2017/A

(i) Site formation of about 5.5 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 800m) connecting the Crematorium and Man Kam To Road and the pick-up/drop-off point at Man Kam To Road;
(iii) Widening two sections of the existing Sha Ling Road (about 900m and 500m respectively);
(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 (the barging point is rejected by Tuen Mun DC and no improvement works required)

Designated Works under FEP-01/534/2017/A

(i) Site formation works for a formed platform of about 1.8 hectares and associated drainage, sewerage and landscape works for development of Columbarium at the Sandy Ridge Cemetery;
(ii) Construction of the pick-up/drop-off point at Man Kam To Road;
(iii) Widening of 900m of the existing Sha Ling Road;
(iv) Improvement works to the existing barging point at Siu Lam (the barging point is rejected by Tuen Mun DC and no improvement works required)

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 **53rd** Monthly EM&A Report summarizing the monitoring results and inspection findings for the period from **1st** to **31st December 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)

- Installation of Type 2 railing and street lighting and beam barriers
- Paving block installation works
- Compaction work at footpath

Contract 2 (CV/2017/02)

- Construction of footpath at Lin Ma Hang Road
- Watermain pipe and sewer installation at Man Kam To Road North Slow Lane
- Construction of road works at Sandy Ridge

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

Item	Description	License/ Permit ref no.		License/ Permit Status
		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

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 for Contract 1	Approved by EPD on 12 October 2018
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

Item	EP and / or FEP Stipulation	Description	Status
			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	Approved by EPD on 9 Nov 2022
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	• 1-hour TSP; • 24-hour TSP
Noise	• $Leq_{(30min)}$ during normal working hours.; and • $Leq_{(15min)}$ during the construction works undertaken in Restricted Hours
Water Quality	**In-situ Measurements** • 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 • 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
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 (μg /m^3)	Limit Level (μg/m^3)

	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
ASR-1	331	181	500	260
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 (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st hour measured	2nd hour measured	3rd hour measured
2-Dec-22	67	3-Dec-22	13:00	69	72	77
8-Dec-22	43	9-Dec-22	9:14	77	83	85
14-Dec-22	46	15-Dec-22	13:00	35	39	42
20-Dec-22	67	21-Dec-22	9:30	85	91	78
23-Dec-22	89	24-Dec-22	9:16	95	98	101
29-Dec-22	103	30-Dec-22	9:45	80	78	85
Average (Range)	**69 (43 – 103)**	Average (Range)		**76 (35 – 101)**		

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

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st hour measured	2nd hour measured	3rd hour measured
2-Dec-22	71	3-Dec-22	13:05	73	81	78
8-Dec-22	90	9-Dec-22	9:17	83	91	87
14-Dec-22	27	15-Dec-22	13:04	31	35	39
20-Dec-22	107	21-Dec-22	9:32	80	86	75
23-Dec-22	123	24-Dec-22	9:21	90	95	93
29-Dec-22	161	30-Dec-22	9:48	84	87	80
Average (Range)	**97 (27 – 161)**	Average (Range)		**76 (31 – 95)**		

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

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st hour measured	2nd hour measured	3rd hour measured
2-Dec-22	19	3-Dec-22	13:12	57	61	63
8-Dec-22	40	9-Dec-22	9:23	62	70	74
14-Dec-22	45	15-Dec-22	13:09	26	29	23
20-Dec-22	15	21-Dec-22	9:36	59	62	56
23-Dec-22	43	24-Dec-22	9:25	88	85	82
29-Dec-22	37	30-Dec-22	9:52	76	70	68
Average (Range)	**33 (19 – 45)**	Average (Range)		**61 (23 – 88)**		

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, ***4*** 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(*)**
9-Dec-22	9:14	67	9:47	65
15-Dec-22	13:00	64	13:33	67
21-Dec-22	9:30	65	10:03	68
30-Dec-22	9:15	66	9:55	70
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**
9-Dec-22	10:20	56	10:55	64
15-Dec-22	14:07	57	14:41	63
21-Dec-22	10:35	60	11:09	65
30-Dec-22	10:38	65	11:16	58
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 ±0.5dB. 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 ***12*** monitoring days were carried out for water quality impact monitoring. Besides, on 2 Dec 2022, the channel of M2 was dried up / too shallow and representative water sampling was unable be carried out. Notification for cancellation of monitoring had been 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)
2-Dec-22	7.56	2.8	5.0
5-Dec-22	7.96	3.4	5.5
7-Dec-22	7.89	2.6	6.0
9-Dec-22	7.58	2.1	3.0
12-Dec-22	8.00	2.0	2.5
14-Dec-22	8.24	3.8	2.5
16-Dec-22	8.48	1.3	3.5
19-Dec-22	8.52	2.4	2.5
21-Dec-22	8.34	2.9	3.0
23-Dec-22	8.03	1.3	4.5
28-Dec-22	8.12	2.3	6.5
30-Dec-22	8.30	3.2	6.5

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
2-Dec-22	8.45	#	7.99	4.2	#	1.8	5.5	#	2.0
5-Dec-22	7.92	6.22	8.07	7.1	24.7	3.2	7.0	25.5	4.5
7-Dec-22	8.06	5.35	8.37	5.7	22.4	1.6	8.0	27.0	3.5
9-Dec-22	7.95	8.52	8.18	1.0	3.0	1.4	2.5	<2	<2
12-Dec-22	7.98	8.34	8.38	4.2	1.6	1.9	6.5	<2	2.5
14-Dec-22	8.38	5.34	8.57	3.3	4.6	4.8	8.0	4.0	<2
16-Dec-22	8.66	8.70	8.79	2.2	1.1	1.1	7.5	<2	2.5
19-Dec-22	8.58	8.64	8.72	4.6	4.2	1.0	4.5	3.5	<2
21-Dec-22	8.49	5.83	8.69	3.0	5.5	2.2	8.0	7.5	3.0
23-Dec-22	8.25	8.43	8.46	5.4	2.8	1.6	6.5	2.0	3.0
28-Dec-22	9.29	8.44	8.44	7.1	1.6	5.0	7.0	6.0	4.5
30-Dec-22	8.18	8.47	8.70	6.1	5.1	3.1	6.5	5.5	4.0

Remarks: (#) The channel of M2 was dried up / too shallow and representative water sampling was unable be carried out

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) (^{o}C)		Water Flow (Averaged) (m/s)	
	min	max	min	max	min	max	min	max
M1	7.0	7.6	0.04	0.08	13.5	16.7	<0.1	<0.1
M2	7.0	7.6	0.07	0.08	14.1	17.8	<0.1	<0.1
M3	7.0	7.8	0.01	0.04	14.3	18.0	<0.1	<0.1
M4	7.0	8.0	0.05	0.09	14.3	18.1	<0.1	<0.1

6.2 WATER QUALITY MONITORING EXCEEDANCE

6.2.1 In this Reporting Month, no water quality exceedances were recorded. The summary of non-compliance of water quality performance is shown 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	0	0	0	0	0	0	0
M2	0	0	0	0	0	0	0	0	0	0
M3	0	0	0	0	0	0	0	0	0	0
M4	0	0	0	0	0	0	0	0	0	0

6.2.1 Notification of Exceedance and the investigation for exceedance in the Reporting Month is summarized in ***Table 6-5***. The investigation reports for exceedance were shown in ***Appendix Q.***

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

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 ***24th December 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 would 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 no mammal species recorded in the monitoring area.

Birds

7.3.3 There were a total of 22 bird individuals from 13 species recorded in the monitoring area. No Golden-headed Cisticola was observed during the bird survey.

Herpetofauna

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

Butterfly

7.3.5 There were a total of 1 butterfly individuals from 1 species recorded in the monitoring area.

Dragonfly

7.3.6 There was no odonate 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	WW	WC
Mammal Survey								
--	--	--	--	--	--	--	--	--
Avifauna Survey								
Spilopelia chinensis	Spotted Dove	珠頸斑鳩		2				
Lanius schach	Long-tailed Shrike	棕背伯勞					1	
Pycnonotus jocosus	Red-whiskered Bulbul	紅耳鵯		5				
Zoothera aurea	White's Thrush	虎斑地鶇		1				
Turdus hortulorum	Grey-backed Thrush	灰背鶇		1				
Calliope calliope	Siberian Rubythroat	紅喉歌鴝					1	
Phylloscopus fuscatus	Dusky Warbler	褐柳莺		1				
Phylloscopus inornatus	Yellow-browed Warbler	黃眉柳莺		1				
Prinia flaviventris	Yellow-bellied Prinia	黃腹鷦莺					2	
Orthotomus sutorius	Common Tailorbird	長尾縫葉莺		1			1	
Garrulax perspicillatus	Masked Laughingthrush	黑臉噪鹛					2	
Phoenicurus auroreus	Dauaian Redstart	北紅尾鴝		1				
Anthus godlewskii	Olive-backed Pipit	樹鷚		2				
Reptile Survey								
N/A	--	--	--	--	--	--	--	--
Amphibian Survey								
N/A	--	--	--	--	--	--	--	--
Butterfly Survey								
Abisara echerius	Plum Judy	蛇目褐蜆蝶		1				
Odonate Survey								
N/A	--	--	--	--	--	--	--	--

*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
N/A	--	--	--	--	--	--	--	--

Discussion

7.3.9 After analysing survey results in December from 2019 to 2022, there was no significant drop in species richness and abundance for wetland habitat. 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. 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 at work area of Contract 2 on ***24th December 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 would 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 11 bird individuals from 3 species recorded in the monitoring area. No Golden-headed Cisticola was observed during the bird survey.

Herpetofauna

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

Butterfly

7.4.5 There was no butterfly species recorded in the monitoring area.

Dragonfly

7.4.6 There were a total of 4 odonate individuals 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								
Pycnonotus jocosus	Red-whiskered Bulbul	紅耳鵯					5	
Prinia flaviventris	Yellow-bellied Prinia	黃腹鷦鶯		2				
Garrulax perspicillatus	Masked Laughingthrush	黑臉噪鶥		4				
Reptile Survey								
--	--	--	--	--	--	--	--	--
Amphibian Survey								
--	--	--	--	--	--	--	--	--
Butterfly Survey								
--	--	--	--	--	--	--	--	--
Odonate Survey								
Pantala flavescens	Wandering Glider	黃蜻						4

*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
Gambusia affinis	Mosquito fish	食蚊魚						+
Puntius semifasciolatus	Chinese Barb	五線無鬚鮆						+

*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 December 2019 to 2022, there was a no significant drop 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. 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 (January 2023) is scheduled on ***10th December 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 There was no precautionary check for the presence of nesting birds conducted outside the concerned breeding season (February to July).

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 for works area of Contract 1 and Contract 2 on ***29th December 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
29th December 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.	• Reminded 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 and T2928 were in fair health condition with normal foliage color and density. Contractor is reminded to provide proper maintenance according to the method statement.	• Reminder only

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

Date	Findings and Reminder	Follow-Up Status
29th December 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)	0.700	--	313.86 **(#)**	--
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)	0.600	Tuen Mun Area 38	313.86 **(#)**	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)	0.048	NENT Landfill	4.670	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 , 8th, 15th, 22nd and 29th December 2022*** and IEC attended joint site inspection on ***15th December 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
1st December 2022	• No adverse environmental issue was observed.	N/A
8th December 2022	• No adverse environmental issue was observed.	N/A
15th December 2022	• No adverse environmental issue was observed.	N/A
22nd December 2022	• No adverse environmental issue was observed.	N/A
29th December 2022	• No adverse environmental issue was observed.	N/A

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 , 8th, 15th, 22nd and 29th December 2022*** and IEC attended joint site inspection on ***15th December 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
1st December 2022	• No adverse environmental issue was observed.	N/A
8th December 2022	• No adverse environmental issue was observed.	N/A
15th December 2022	• The Contractor was reminded to clean the muddy trail within the site.	• Reminder only.
22nd December 2022	• No adverse environmental issue was observed.	N/A
29th December 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
1st – 31st December 2022	Contract 1	0	2	(1) Air Quality (1) Noise
1st – 31st December 2022	Contract 2	0	6	(1) Water (2) Air Quality (1) Noise (1) Soil / muddy water

Table 11-2 Statistical Summary of Environmental Summons

Reporting Month		Environmental Summons Statistics		
		Frequency	Cumulative	Complaint Nature
1st – 31st December 2022	Contract 1	0	0	NA
1st – 31st December 2022	Contract 2	0	0	NA

Table 11-3 Statistical Summary of Environmental Prosecution

Reporting Month		Environmental Prosecution Statistics		
		Frequency	Cumulative	Complaint Nature
1st – 31st December 2022	Contract 1	0	0	NA
1st – 31st December 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	• 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	• 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	• 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	• 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	• 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	• 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:

- Utilities works at FS17,13
- Paving block installation works
- Compaction works at footpath
- Laying bitumen works
- U-channel construction works (Slope drain work) at Fill Slope FS17

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

- Construction of footpath at Lin Ma Hang Road
- Watermain pipe and sewer installation work at Man Kam To Road
- Planting works at Sandy Ridge and Lin Ma Hang Road

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
Paving block installation works	• Crane lorry • Compaction roller	• Provided efficient silt removal facilities to reduce SS level before effluent discharge. • 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; • Stockpiles of dusty material were covered with impervious sheeting. • Provided workers to clear dusty materials at the vehicle entrance or exit regularly. • 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. • 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" • 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.
Compaction works at footway at Sha Ling Road near Man Kam To Road	• Excavator • Compaction roller	

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

Construction Activities	Used on PME	Environmental Mitigation Measures
Construction of footpath at Lin Ma Hang Road	• Dump truck • Excavator	• Provided efficient silt removal facilities to reduce SS level before effluent discharge. • Exposed slopes surface were compacted and covered with

Construction Activities	Used on PME	Environmental Mitigation Measures
Watermain pipe and sewer installation works at Man Kam To Road	● Excavator	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. ● 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. ● Demarcation fencing has been erected to prevent unauthorised encroachment into the riparian corridor by constructions works and traffic. ● 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.
Planting works at Sandy Ridge and Lin Ma Hang Road	● Excavator ● Roller ● Dump truck	

12.3.2 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 **53rd** Monthly EM&A Report presenting the monitoring results and inspection findings for the period of **1st** to **31st December 2022**.

13.1.2 In the Reporting Month, 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, no water quality monitoring exceedance was recorded.

13.1.5 Monthly ecological monitoring for sensitive habitat for area of Contract 1 and Contract 2 were undertaken on ***24th* December *2022***. After analysing survey results in November from 2019 to 2022, there was no significant drop in species richness and abundance for wetland and non-wetland habitat for area of both Contract 1 and 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 There was no precautionary check for the presence of nesting birds conducted outside the concerned breeding season (February to July).

13.1.7 Landscape and visual inspection at both Contracts were undertaken on ***29th* December *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 , 8th, 15th, 22nd and 29th December 2022.*** Moreover, joint site inspections for Contract 2 by the RE, ET and the Contractor of Contract 2 were carried out on ***1st , 8th, 15th, 22nd and 29th December 2022.*** IEC attended the both Contract joint site inspection on ***15th December 2022***. No non-compliance was noted during the site inspections.

13.2 RECOMMENDATIONS

13.2.1 During dry season, the Contractors are reminded to pay special attention on the 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.

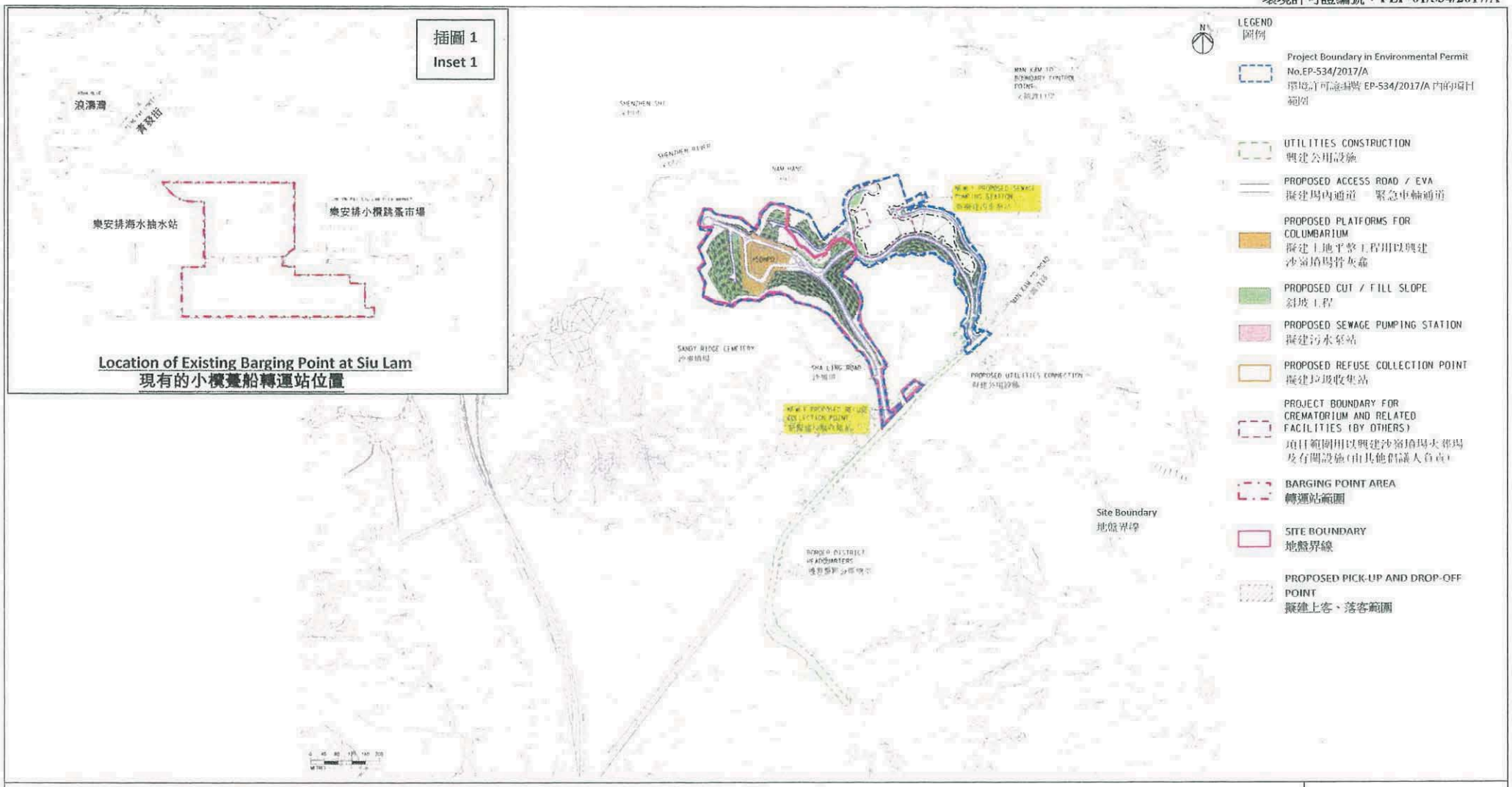
13.2.2 Water quality mitigation measures as recommended in the EM&A Manual should be fully implemented, in particular to prevent surface runoff and other pollutants from flowing to local stream and Conservation Area.

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

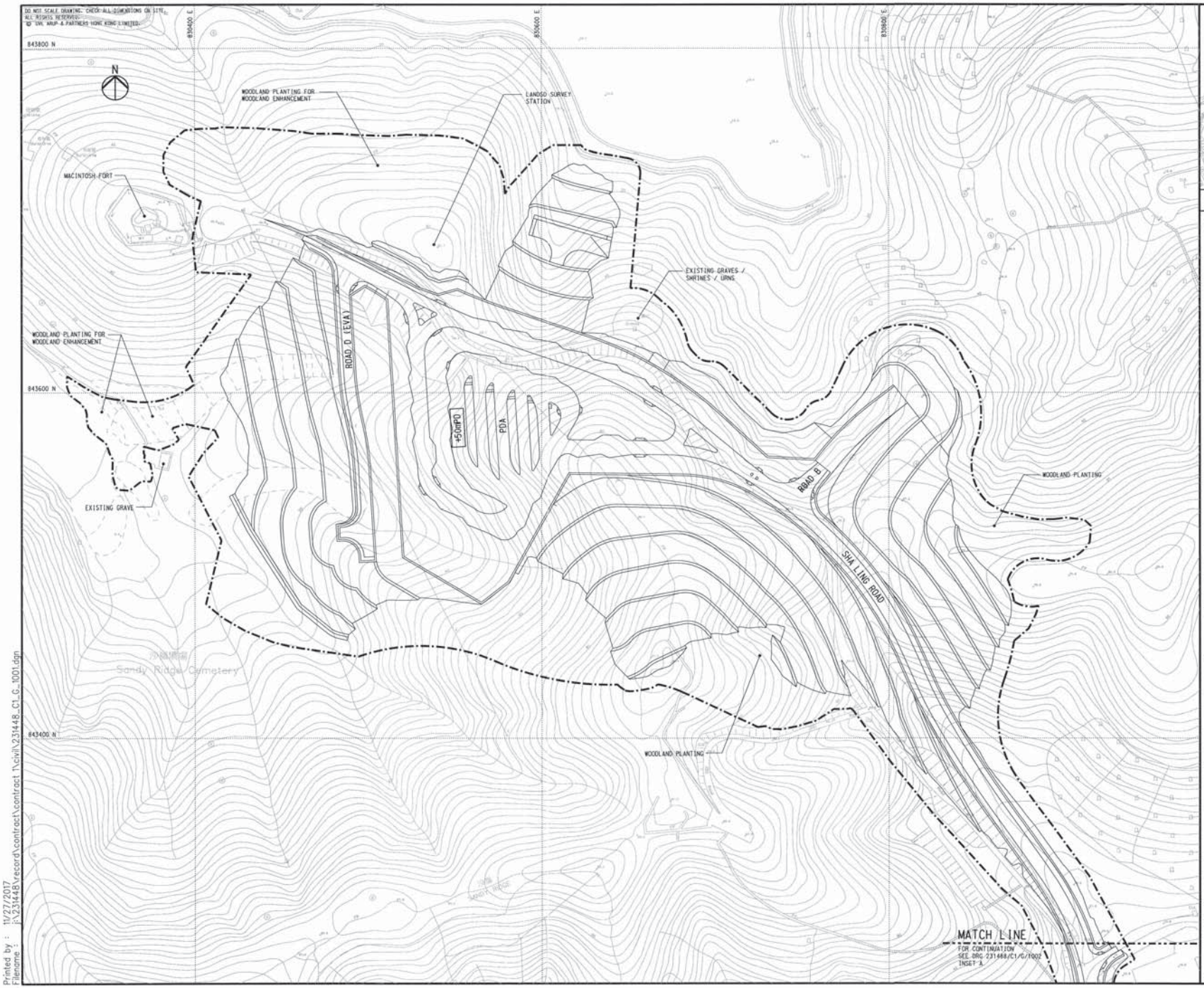


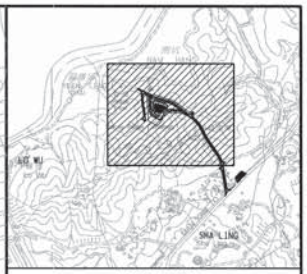
Project Title: Site Formation and Associated Infrastructural Works for Development of Columbarium at Sandy Ridge Cemetery
工程名稱：沙嶺墳場興建骨灰龕的工地平整及相關基建工程

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証申請文件編號：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

EIAO Ordinance Register
EIAO
EPD





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

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(SHEET 1 OF 3)

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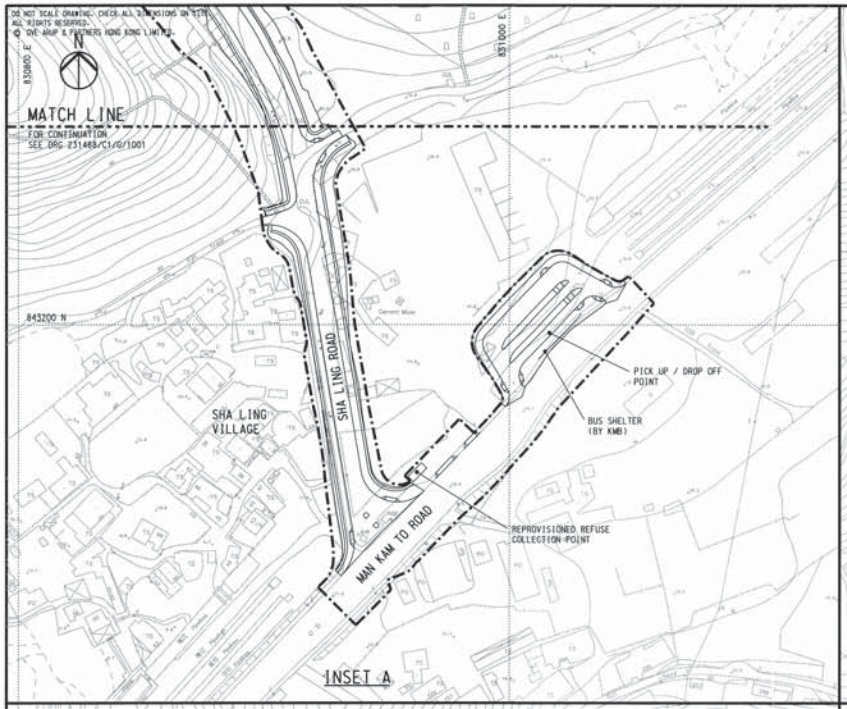

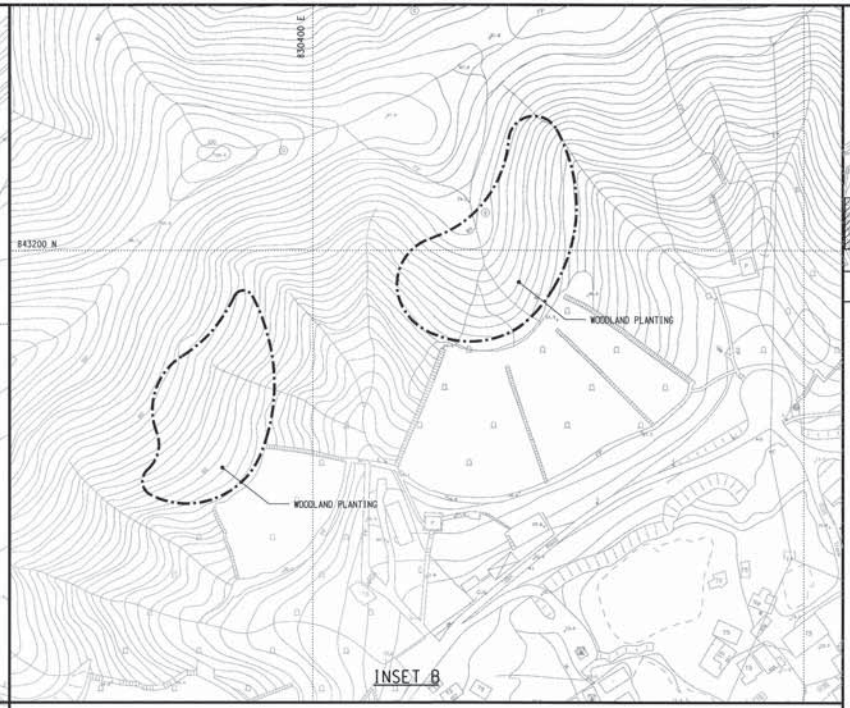

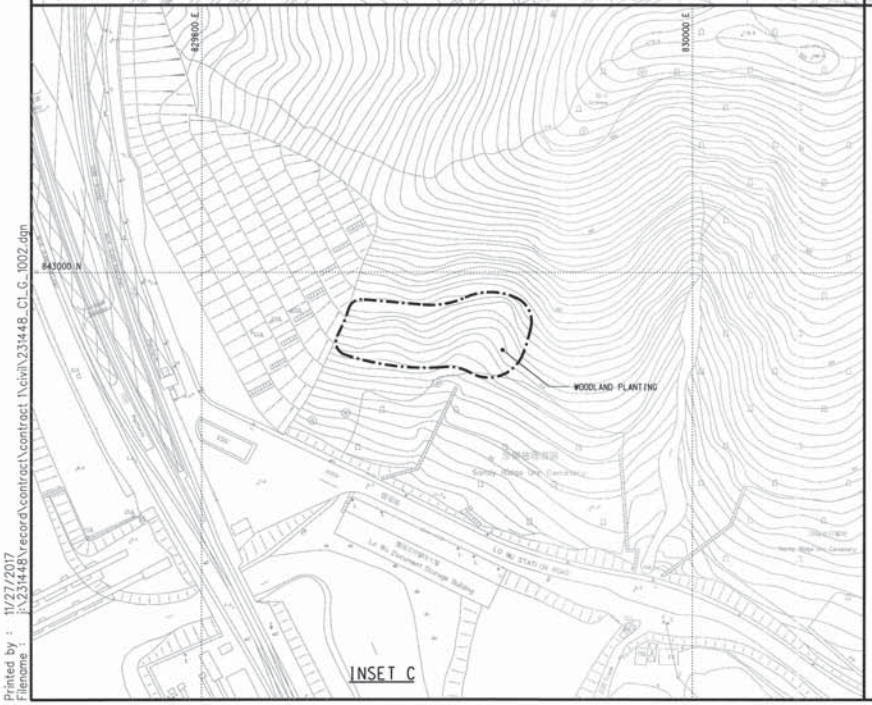

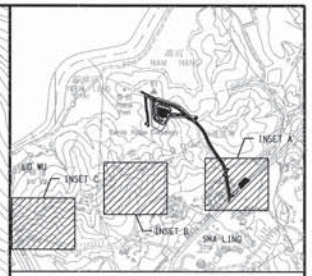

KEY PLAN

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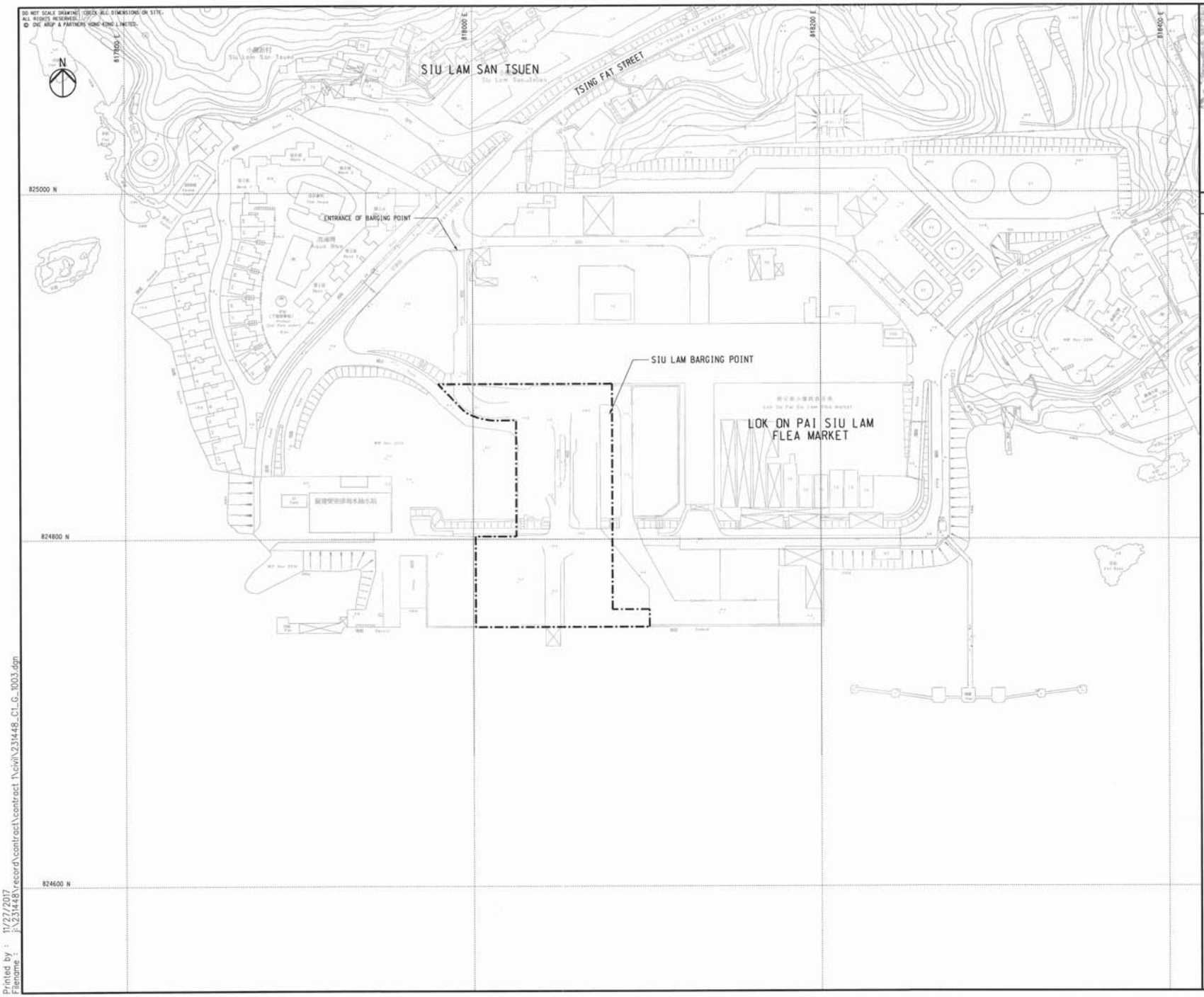

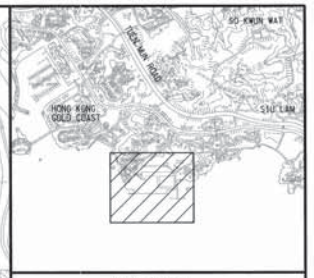

KEY PLAN

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PROPOSED WORKS SITE

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Layout Plan of Contract CV/2017/02

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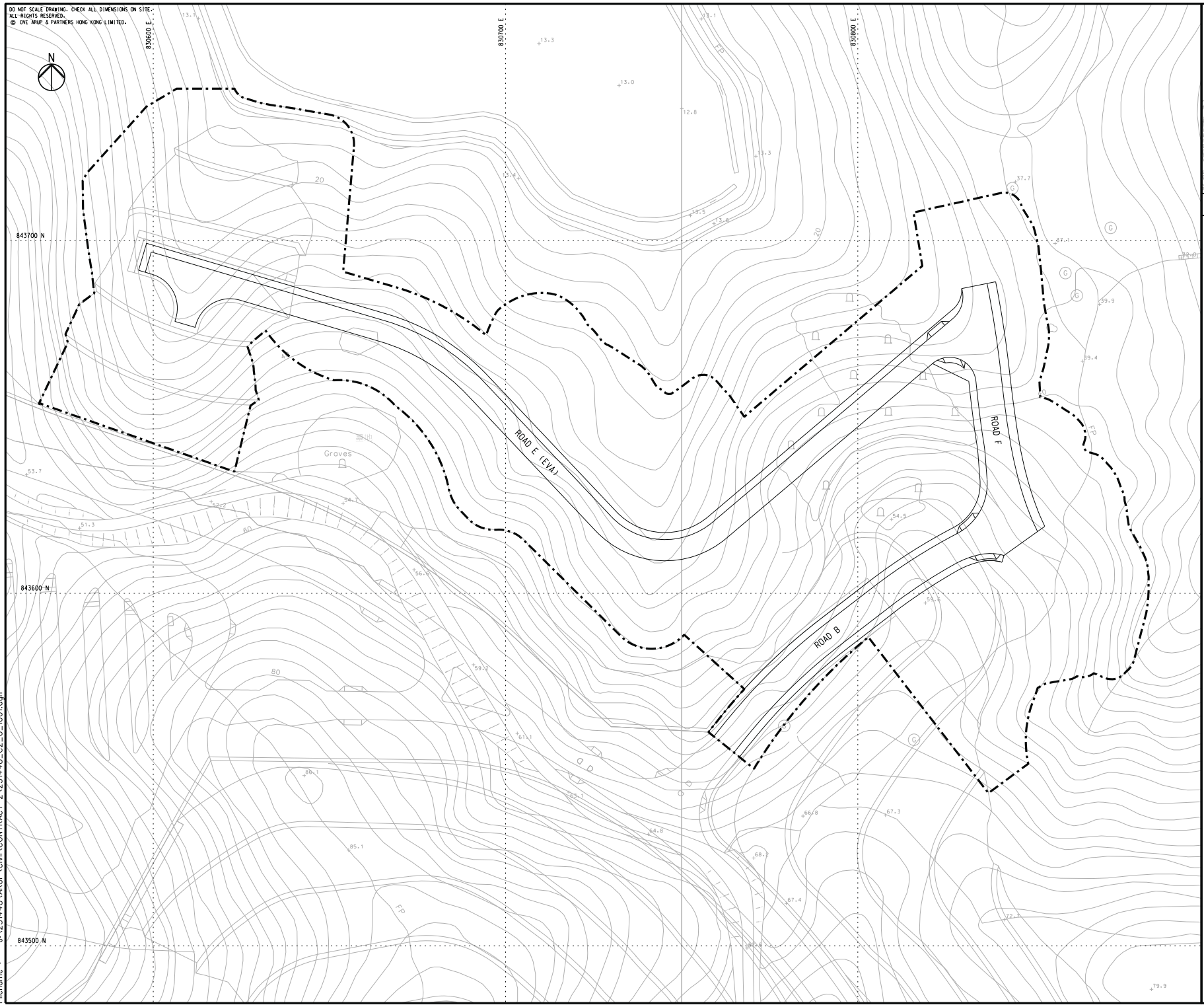

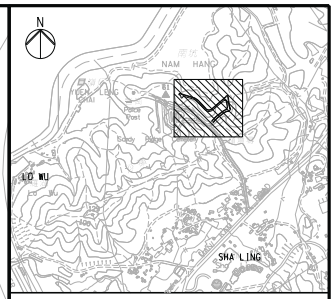

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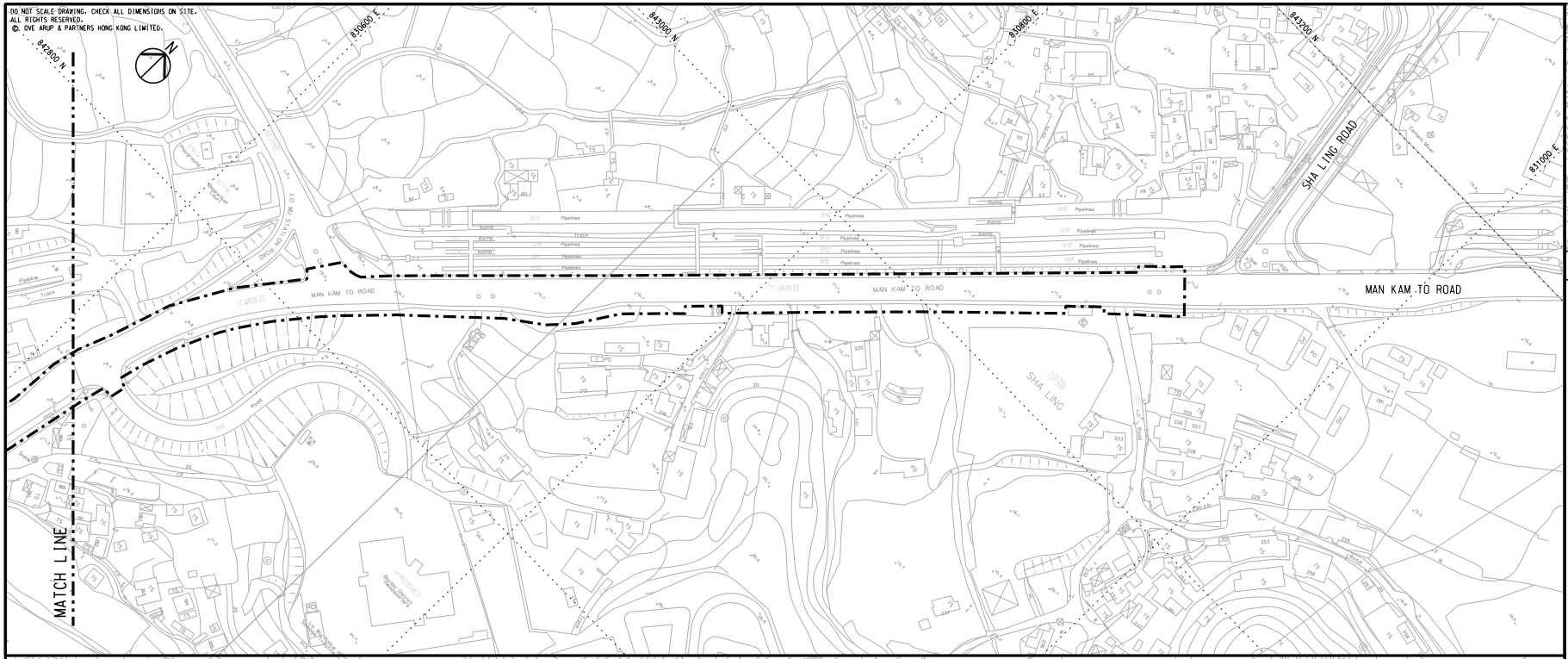

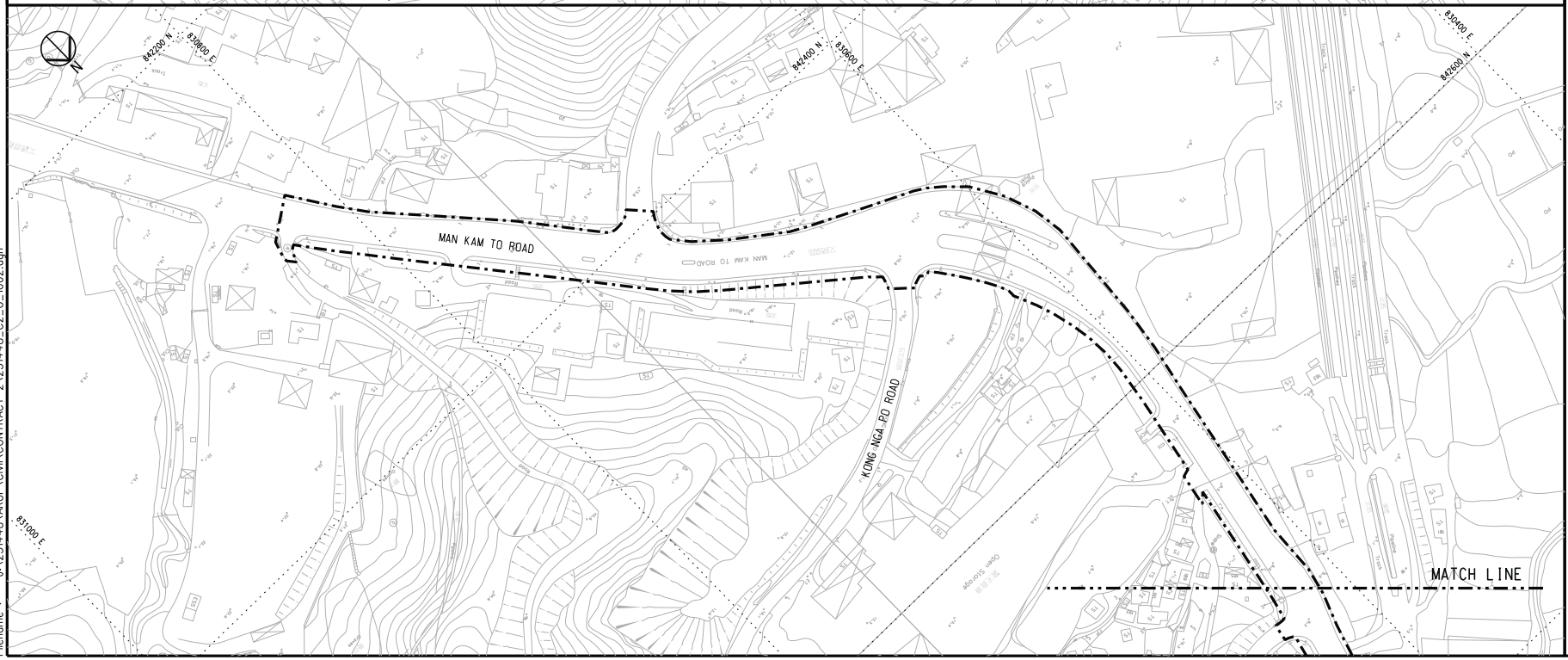

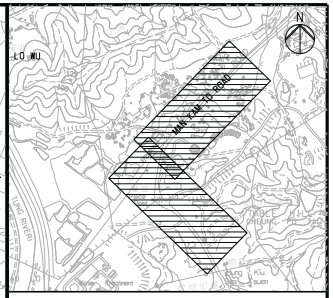

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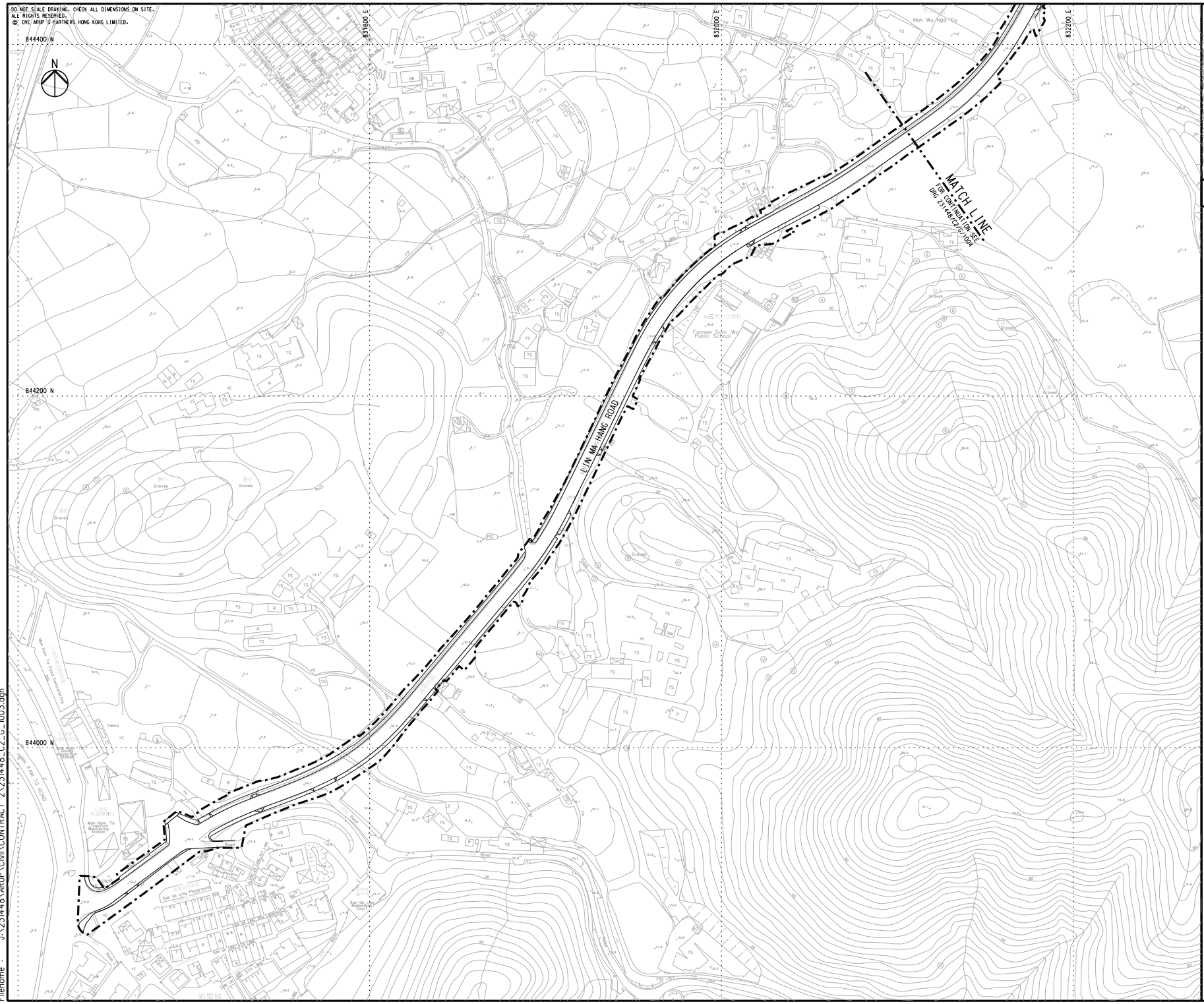

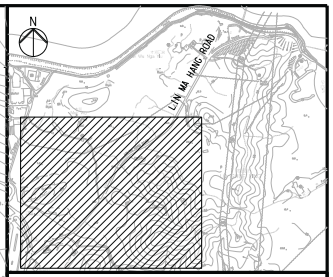

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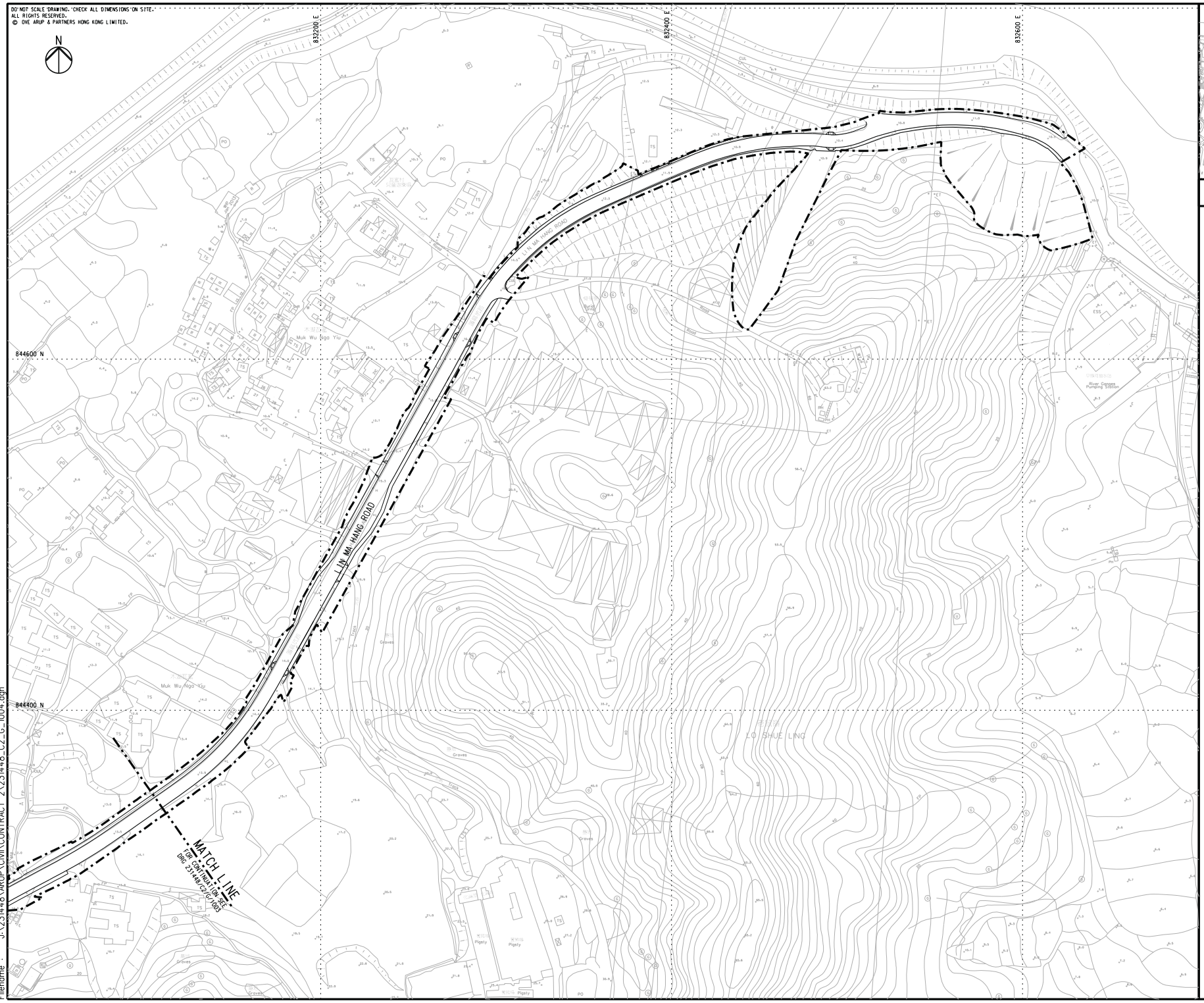

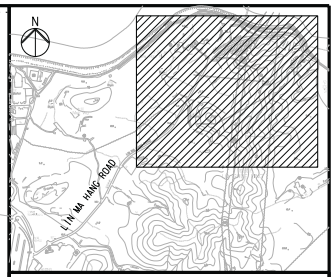

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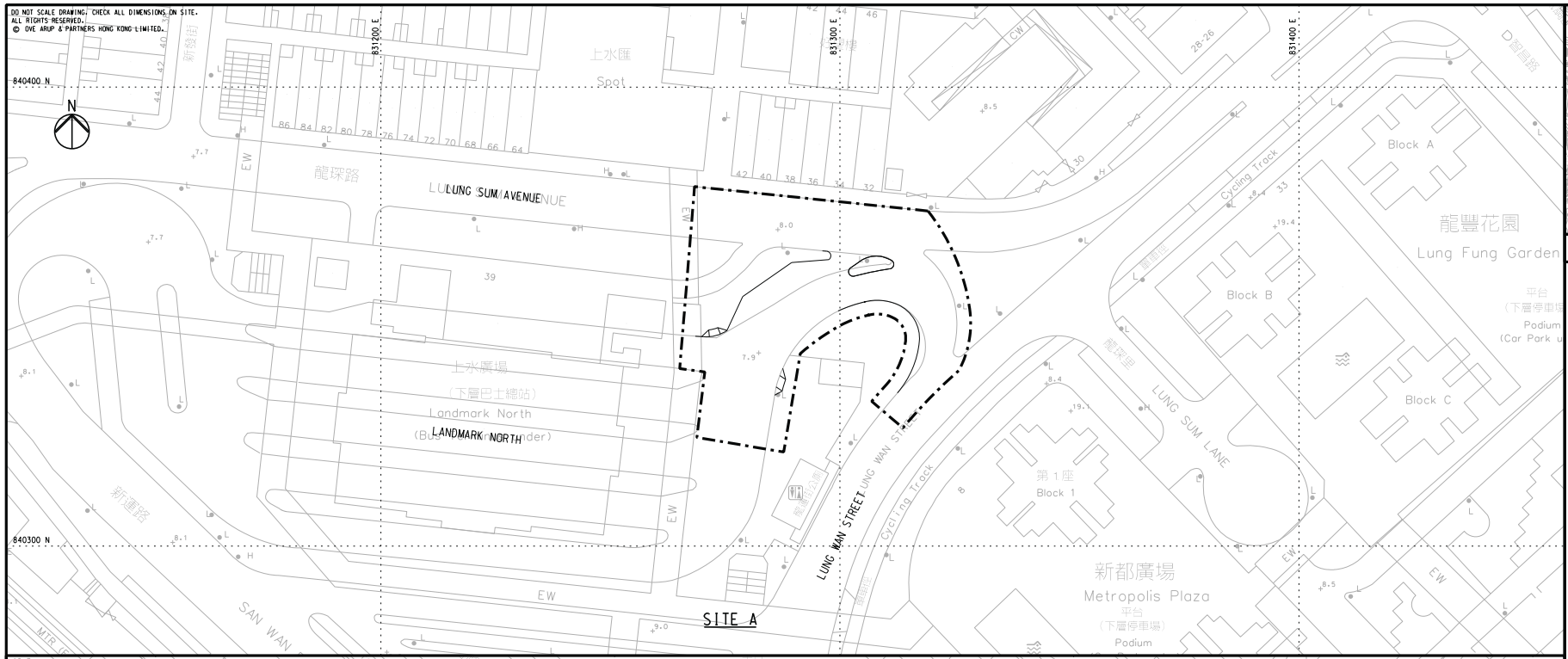

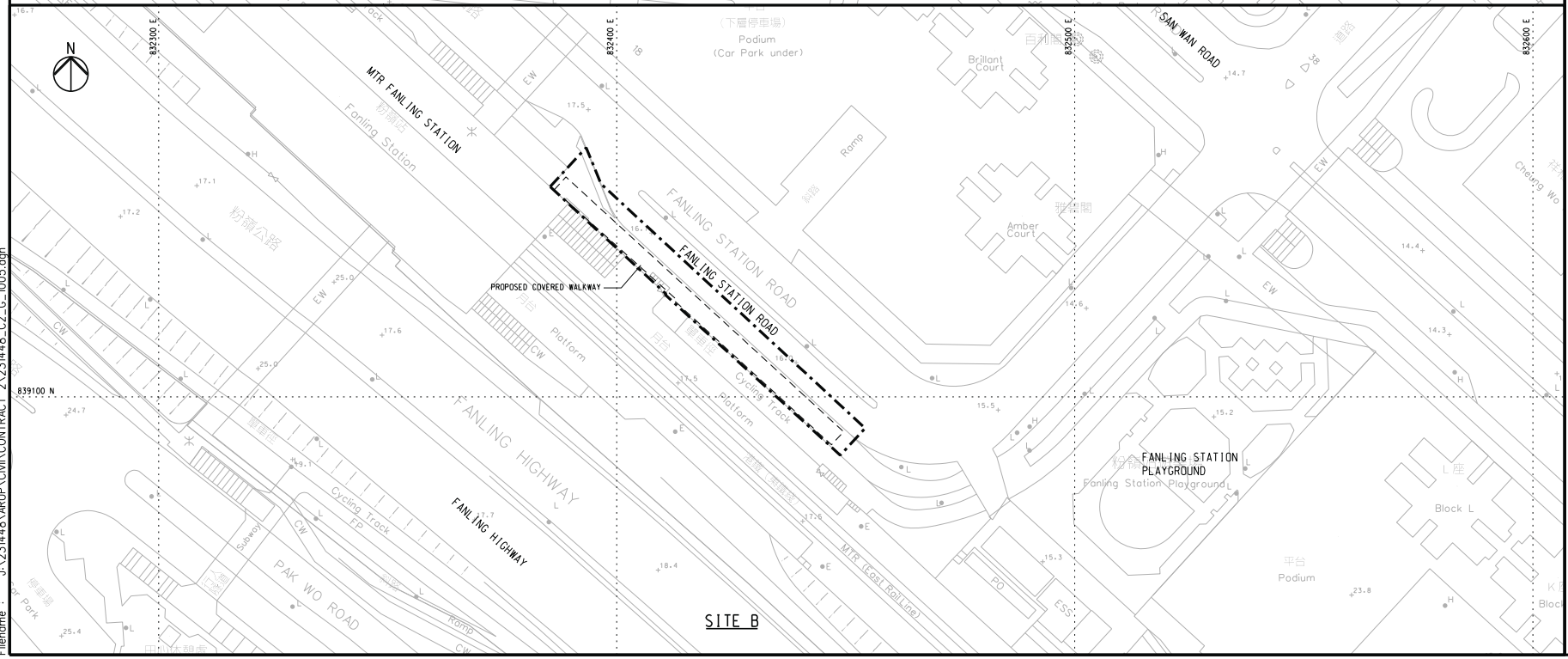

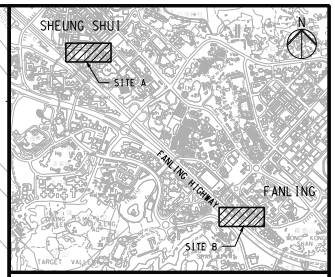

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LEGEND:

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Consultant

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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

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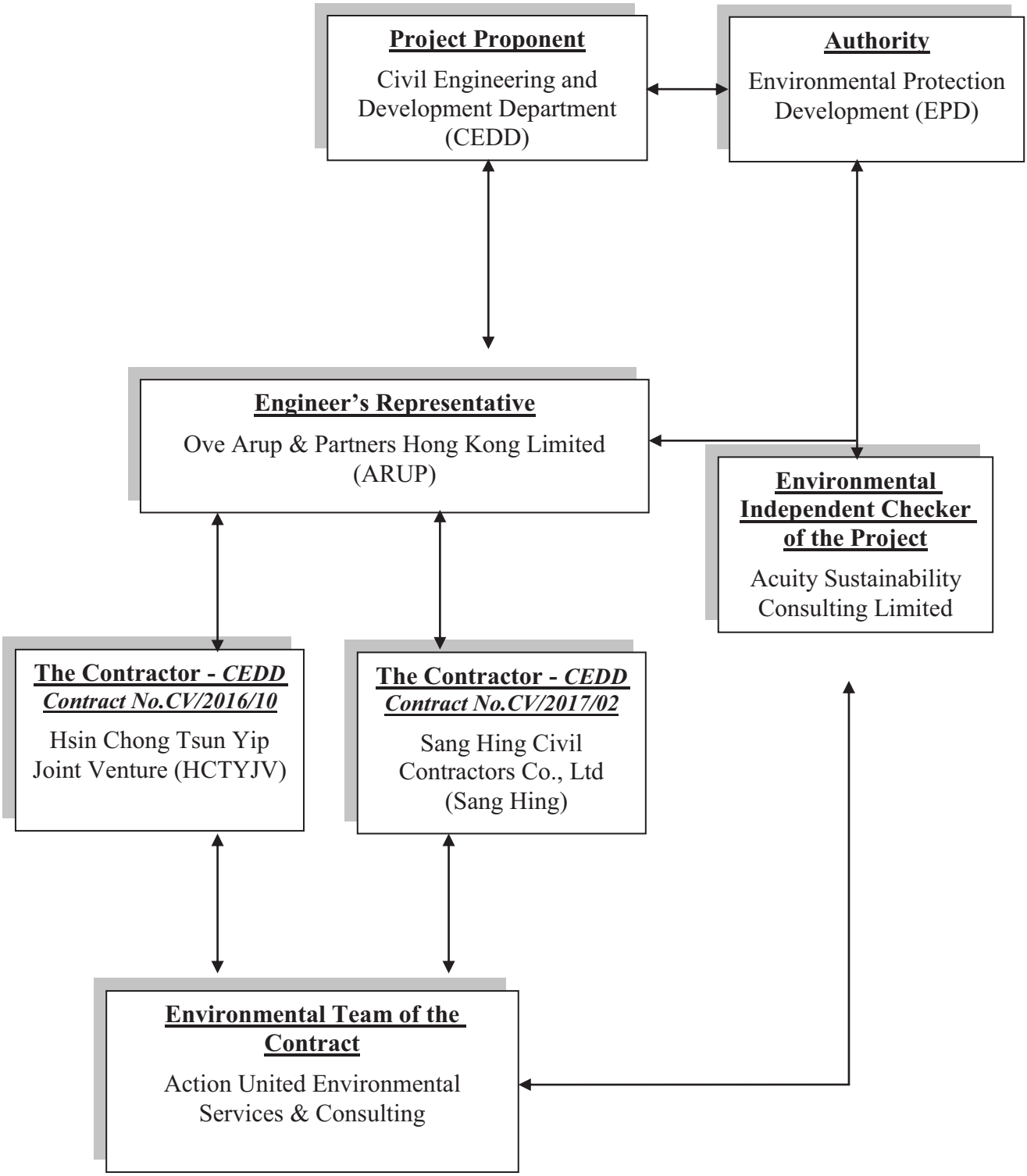
Appendix B

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	BOK Kwok-ming, Aaron	2762-5624	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
AUES	Qualified Ecologist	Mr. Leung Wing Keung, Mike	2959-6059	2959-6079
AUES	Qualified Ecologist	Mr. Keith L.W. Kei	2959-6059	2959-6079
AUES	Registered Landscape Architect	Mr. Shui Yau Bun, Ivan	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	BOK Kwok-ming, Aaron	2762-5624	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
AUES	Qualified Ecologist	Mr. Leung Wing Keung, Mike	2959-6059	2959-6079
AUES	Qualified Ecologist	Mr. Keith L.W. Kei	2959-6059	2959-6079
AUES	Qualified Ecologist	Mr. N.L Lam, Alan	2959-6059	2959-6079
AUES	Registered Landscape Architect	Mr. Shui Yau Bun, Ivan	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

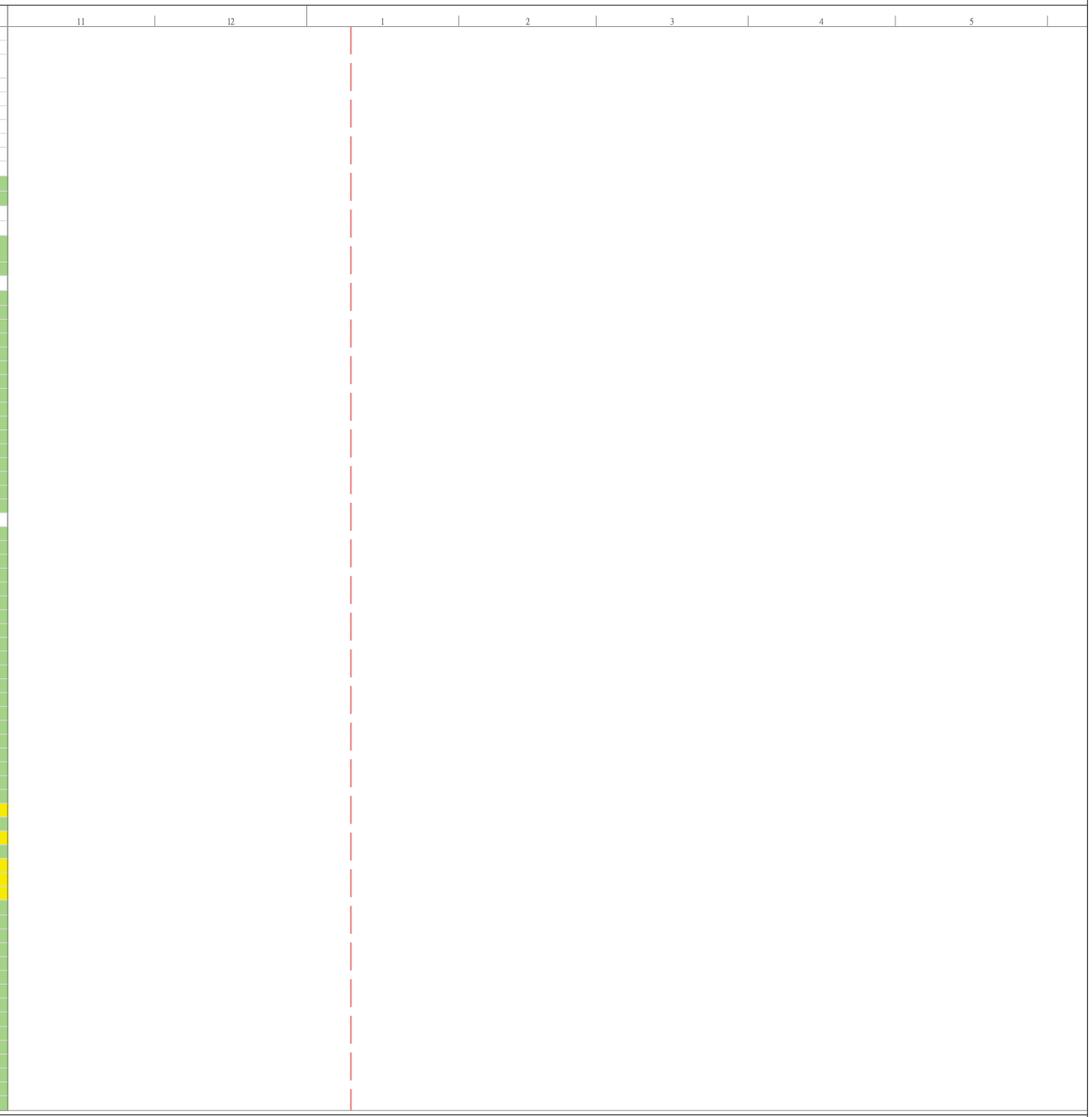
Contract CV/2016/10

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

3 Month Rolling Programme (Dec 2022 to Feb 2023)

Hsin Chong Tsun Yip Joint Venture
Updated Date : Jan 2023

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



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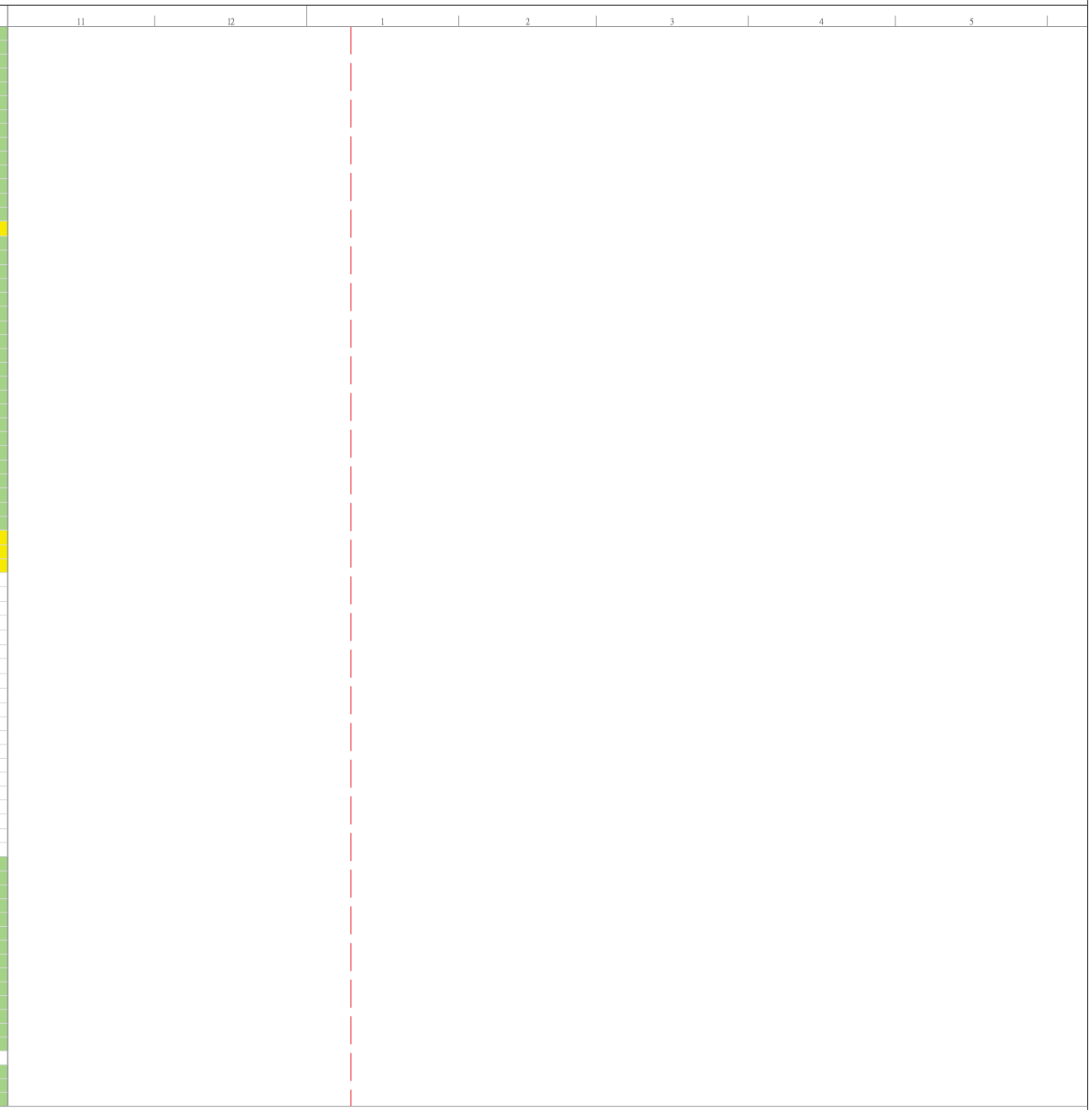
ID	Task Name	Duration	Start
77	Filling (Rolling by Pass)(~7.5m, 0.5m per day)	130 days	Sat 14/3/20
78	**Filling in 3m Zone**	133 days	Sat 22/8/20
79	Benching Works for Rolling by Pass Surface	3 days	Sat 22/8/20
80	Lay Rockfill Layer (7.5m/1m per 5 day)	130 days	Wed 26/8/20
81	Drainage and Maintenance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



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Development of Columbarium at Sandy Ridge Cemetery

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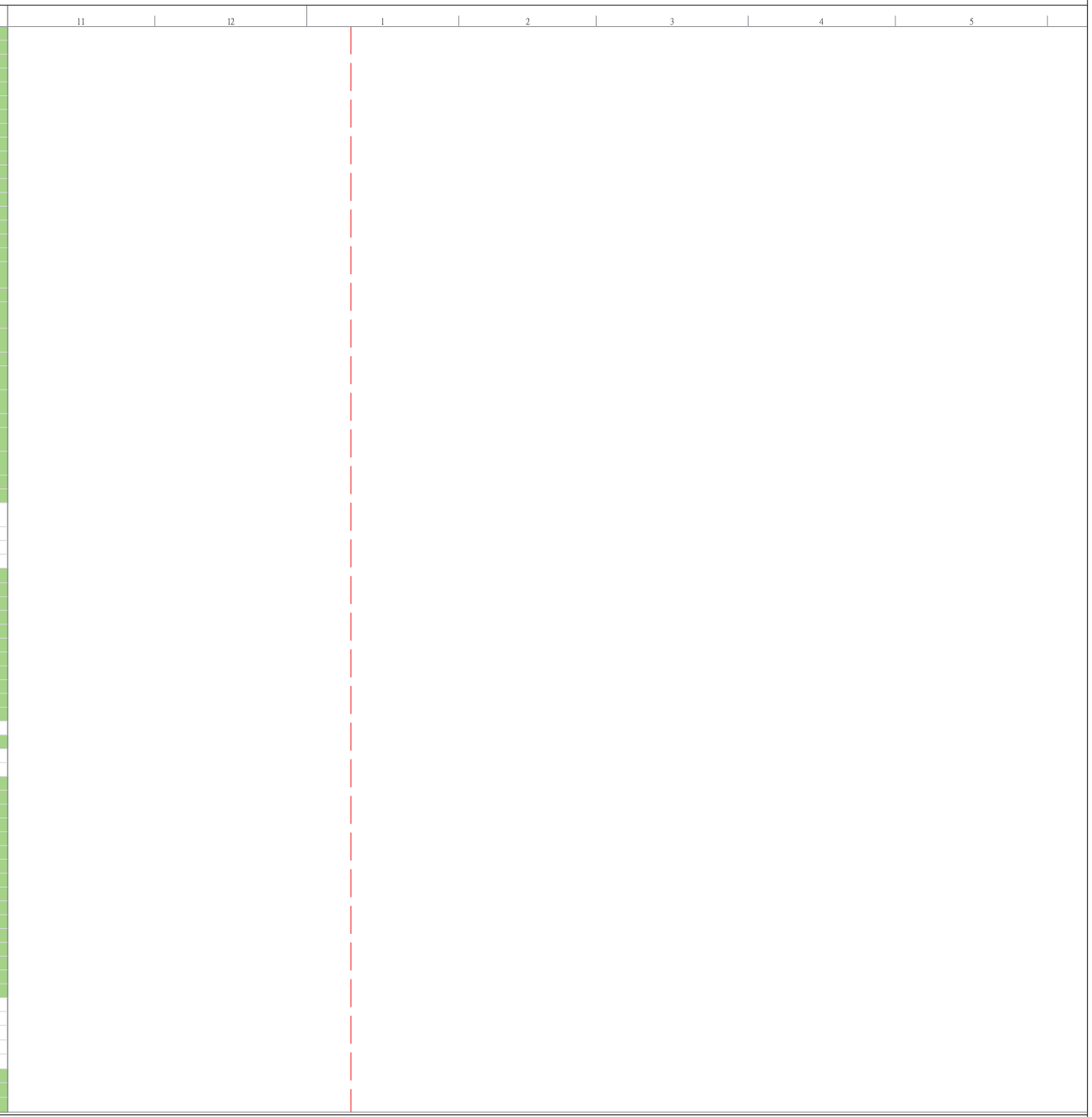
Hsin Chong Tsun Yip Joint Venture
Updated Date : Jan 2023

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



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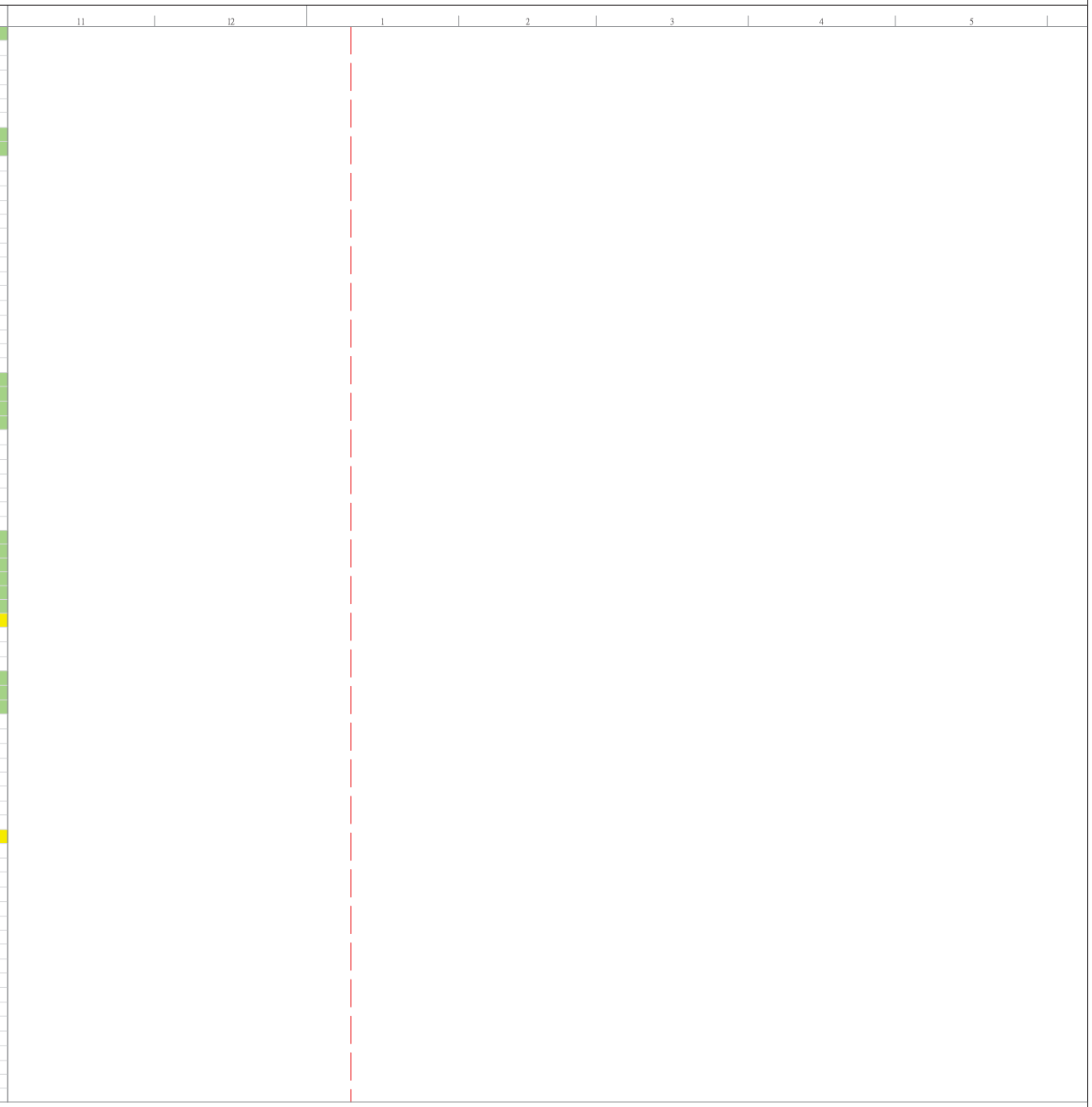
ID	Task Name	Duration	Start
226	Utilities (by others)	3 days	Tue 12/1/21
227	**Carriageway and Footway**	**57 days**	**Fri 23/7/21**
228	Backfilling to Formation Level	11 days	Fri 23/7/21
229	Carriageway	28 days	Thu 5/8/21
230	Footpath, Road Marking and Street Furniture	18 days	Tue 7/9/21
231	**Civil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



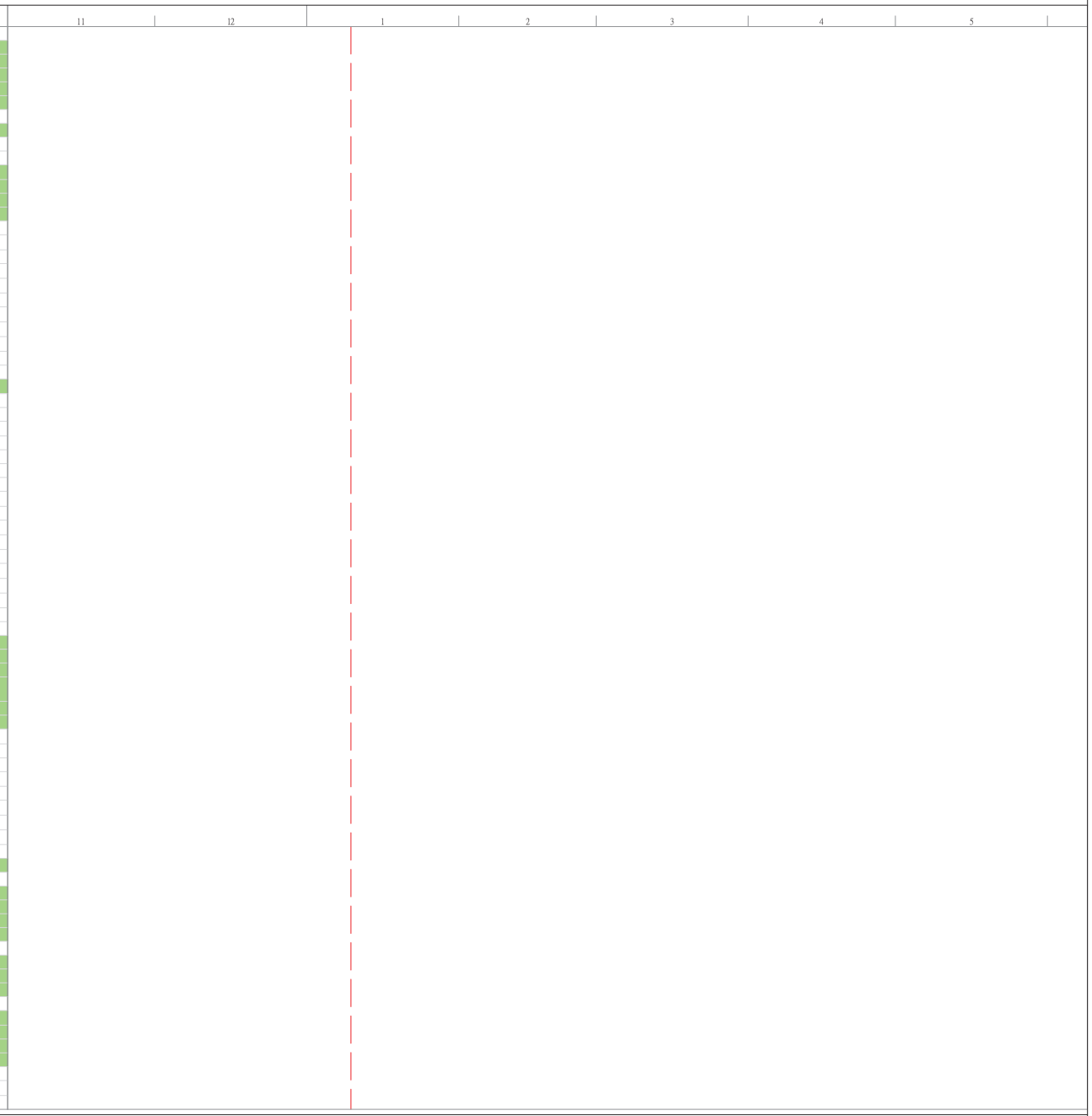
Task | Summary | Progress | Inactive Milestone | Manual Task | Manual Summary Rollup | Start-only | Manual Progress
Milestone | Critical | Inactive Task | Inactive Summary | Duration-only | Manual Summary | Finish-only

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

3 Month Rolling Programme (Dec 2022 to Feb 2023)

Hsin Chong Tsun Yip Joint Venture
Updated Date : Jan 2023

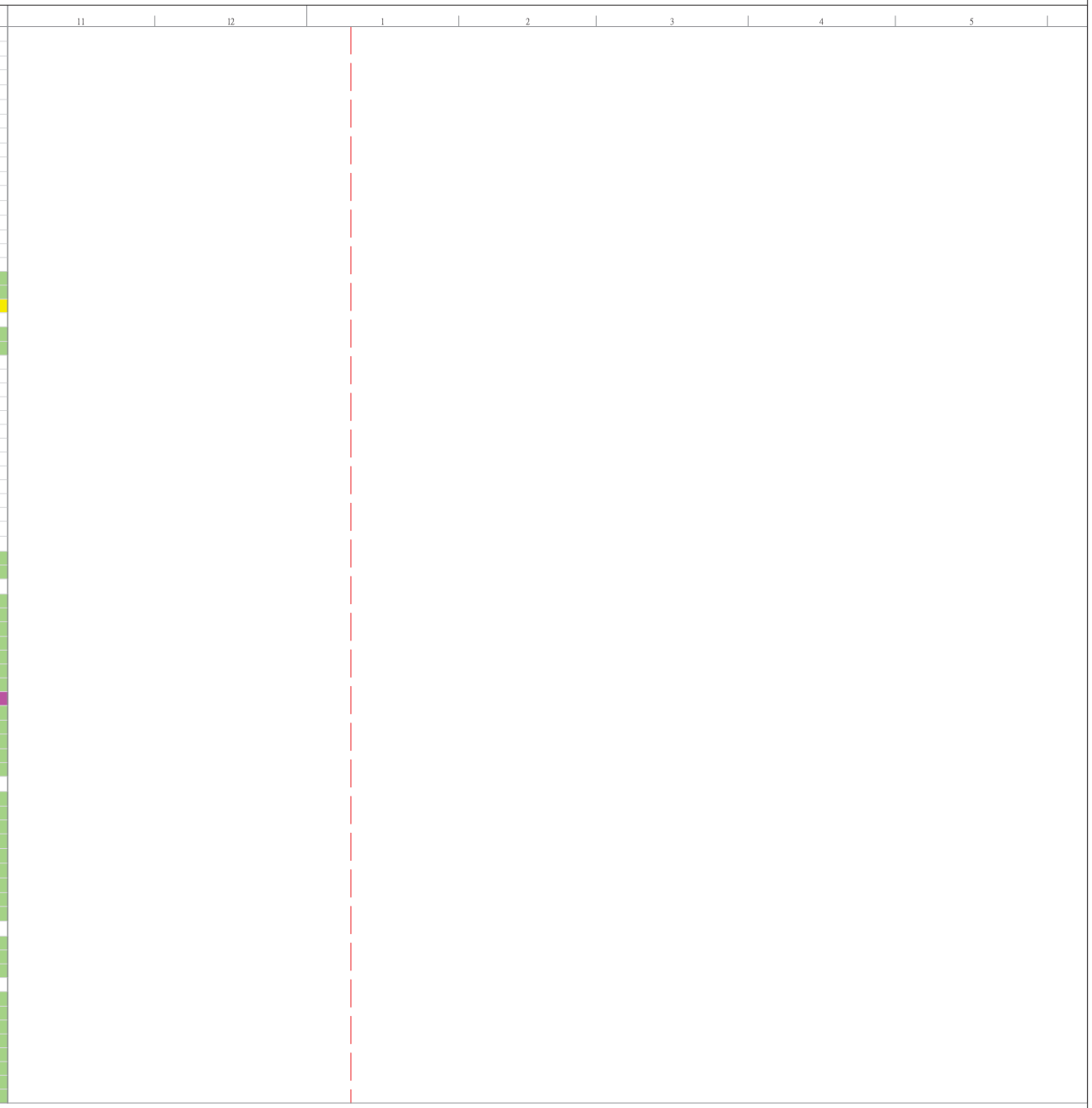
ID	Task Name	Duration	Start
301	**Land Decontamination Works**	**293 days**	**Tue 2/10/18**
302	Re-appraisal and Contamination Assessment Plan (CAP) Submission to EPD	10 days	Tue 2/10/18
303	EPD Review and Acceptance for CAP	195 days	Fri 12/10/18
304	Environmental SI for Determination of Decontamination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



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 (Dec 2022 to Feb 2023)

ID	Task Name	Duration	Start
377	Watermain FW3 (CH000-045)	6 days	Mon 19/7/21
378	Road Lighting Civil Works Provision	8 days	Mon 19/7/21
379	Utilities (by others)	25 days	Thu 13/5/21
380	**Carriageway and Footway (RHS+ Man Kan To EB Slow Lane)**	**38 days**	**Wed 28/7/21**
381	Backfilling to Formation Level	10 days	Wed 28/7/21
382	Carriageway	24 days	Mon 9/8/21
383	Footpath, Road Marking and Street Furniture	4 days	Mon 6/9/21
384	**Waterworks / Drainage / Sewerage/ Utilities Works (LHS)**	**52 days**	**Mon 6/9/21**
385	Sewerage Works / Drainage Works	42 days	Mon 6/9/21
386	Road Lighting Civil Works Provision	5 days	Thu 28/10/21
387	Utilities (by others)	10 days	Thu 28/10/21
388	**Carriageway and Footway (LHS)**	**38 days**	**Tue 9/11/21**
389	Backfilling to Formation Level	10 days	Tue 9/11/21
390	Carriageway	24 days	Sat 20/11/21
391	Footpath, Road Marking and Street Furniture	4 days	Sat 18/12/21
392	**Part C**	**902 days**	**Sat 15/12/18**
393	**Consent from WSD for Works Near Dong Jing Watermain**	**702 days**	**Sat 15/12/18**
394	Investigation works / Trial Pits for Watermains	60 days	Sat 15/12/18
395	Submission for Tempworks	102 days	Sat 23/2/19
396	Approval from WSD (RFI No.66) & Re-design the arrangement	546 days	Tue 2/7/19
397	**Refuse Collection Point**	**200 days**	**Tue 4/5/21**
398	General Excavation with ELS to Formation	15 days	Tue 4/5/21
399	Substructure Construction	20 days	Sat 22/5/21
400	Superstructure Construction	45 days	Wed 16/6/21
401	Pavement / Footpath reinstatment	90 days	Mon 9/8/21
402	ABWF Works	120 days	Mon 9/8/21
403	E&M and Waterworks	120 days	Mon 9/8/21
404	**Landscape Works**	**274 days**	**Tue 2/3/21**
405	at Cut Slope CS1, CS2, CS3	90 days	Wed 8/9/21
406	at Cut Slope CS11, CS12, CS13	90 days	Thu 12/8/21
407	at Cut Slope CS15, CS16, CS17	90 days	Tue 2/3/21
408	at Fill Slope FS13, FS14, FS17	60 days	Wed 13/10/21
409	Sha Ling Road and Man Kam To Road	30 days	Thu 23/12/21
410	Woodland Planting at Site 1,2,4, 7, 8, 9	170 days	Tue 2/3/21
411	Irrigation System and Water Points (Except Water Connection)	30 days	Fri 3/12/21
412	**Section 3 of the Works (Part E)**	**457 days**	**Thu 31/5/18**
413	**Ground Investigation and Geotechnical Instrumentation for Commencement of Slopework**	**64 days**	**Thu 31/5/18**
414	Verification Drillholes (2 Nos., VDH4-5) and Preliminary Results Submission	43 days	Thu 31/5/18
415	Design Review	36 days	Thu 5/7/18
416	**Fill Slope FS3 (Section 17 at Drawing C1/GE/1053)**	**424 days**	**Wed 11/7/18**
417	Time Lag of CE16	100 days	Wed 11/7/18
418	RFI046 Outfall Location	47 days	Mon 8/10/18
419	Drainage, Maintenance Access at slope toe	63 days	Sat 16/2/19
420	Construction of Outfall CP14X	11 days	Mon 7/1/19
421	FS3 Filling Stage 1(~+16 to+17.6 mPD)	121 days	Thu 6/12/18
422	CE50-No Fine at Slope Toe	12 days	Fri 26/4/19
423	FS Filling (+16.9 to +27.6 mPD) (Rolling by Pass)	60 days	Thu 23/5/19
424	FS Filling (+27.6to 30 mPD) (Rolling by Pass)	12 days	Sat 3/8/19
425	FS3 Filling Stage 1 (+16.9 to +21 mPD)	41 days	Sat 17/8/19
426	Drainage and Maintenance Access (+21 to +28.5 mpD)	19 days	Tue 8/10/19
427	FS3 Filling Stage 2 (~7.5m, 21 to +28.5 mPD)	10 days	Wed 30/10/19
428	Drainage and Maintenance Access (+28.5 to +35.5mpD)	15 days	Fri 22/11/19
429	FS3 Filling Stage 3 (~7.5m, +28.5 to 35.5 mPD)	17 days	Thu 21/11/19
430	**Retaining Wall RW4**	**96 days**	**Sat 17/8/19**
431	General Excavation to Formation Level(Bay1~2)	23 days	Sat 17/8/19
432	Plate Load Test and Blinding Layer for Retaining Wall Bays 3-8	5 days	Fri 13/9/19
433	Plate Load Test and Blinding Layer for Retaining Wall Bays 1-2	5 days	Fri 20/9/19
434	Base Slab of Retaining Wall RW4 Bay 1-4	16 days	Fri 20/9/19
435	Base Slab of Retaining Wall RW4 Bay 5-8	16 days	Thu 26/9/19
436	Wall Stem of Retaining Wall RW4 Bay 1-4	30 days	Fri 11/10/19
437	Wall Stem of Retaining Wall RW4 Bay 5-8	20 days	Thu 17/10/19
438	Protective Coating / Subsoil Drain / Filter Layer	5 days	Sat 9/11/19
439	Backfilling behind RW4 and Fill Slop FS4 (~8m up to +35.5 mPD)	22 days	Fri 15/11/19
440	**Fill Slope FS2**	**47 days**	**Thu 17/10/19**
441	Drainage and Maintenance Access (+35.5 to +43.0 mpD)	19 days	Thu 17/10/19
442	FS2 Filling Stage 1 (~7.5m, +35.5 to +43 mPD)	20 days	Fri 8/11/19
443	Drainage and Maintenance Access (+43.0 to +50 mpD)	30 days	Thu 17/10/19
444	FS2 Filling Stage 2 (~7.5m, +43 to +50 mPD)	18 days	Wed 20/11/19
445	**Cut Slope CS18 and CS19**	**235 days**	**Mon 25/2/19**
446	**Slope Cutting (+54.5 to crest)**	**30 days**	**Wed 27/2/19**
447	Confirmation of Interface Details at CS18/19 (NCE29)	30 days	Wed 27/2/19
448	Drainage and Maintenance Access (crest)+ GI Works	8 days	Wed 3/4/19
449	Slope Cutting and Raking Drain (+47 to +54.5mPD, 13 nos. of Raking Drain)	113 days	Mon 25/2/19
450	Drainage and Maintenance Access (+54.5 to +62mPD slope surface/berm)+ GI Works	30 days	Thu 4/4/19
451	Slope Cutting and Raking Drain (+47mPD to toe, 18 nos. of Raking Drain)	110 days	Mon 6/5/19
452	Drainage and Maintenance Access (below +47mPD slope surface/berm)+ GI Works	70 days	Sat 14/9/19



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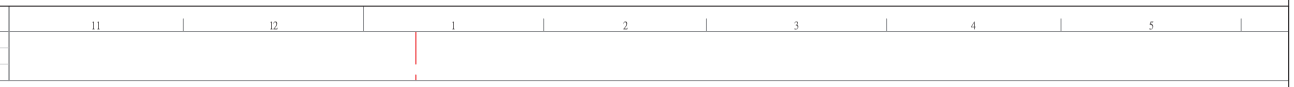
Contract No. CV/2016/10
Site Formation and Associated Infrastructural Works for
Development of Columbarium at Sandy Ridge Cemetery

3 Month Rolling Programme (Dec 2022 to Feb 2023)

Hsin Chong Tsun Yip Joint Venture
Updated Date : Jan 2023

ID	Task Name	Duration	Start
453	**Landscape Works**	**67 days**	**Mon 16/9/19**
454	at Fill Slope FS2, FS3	50 days	Tue 8/10/19
455	at Cut Slope CS18, CS19	60 days	Mon 16/9/19



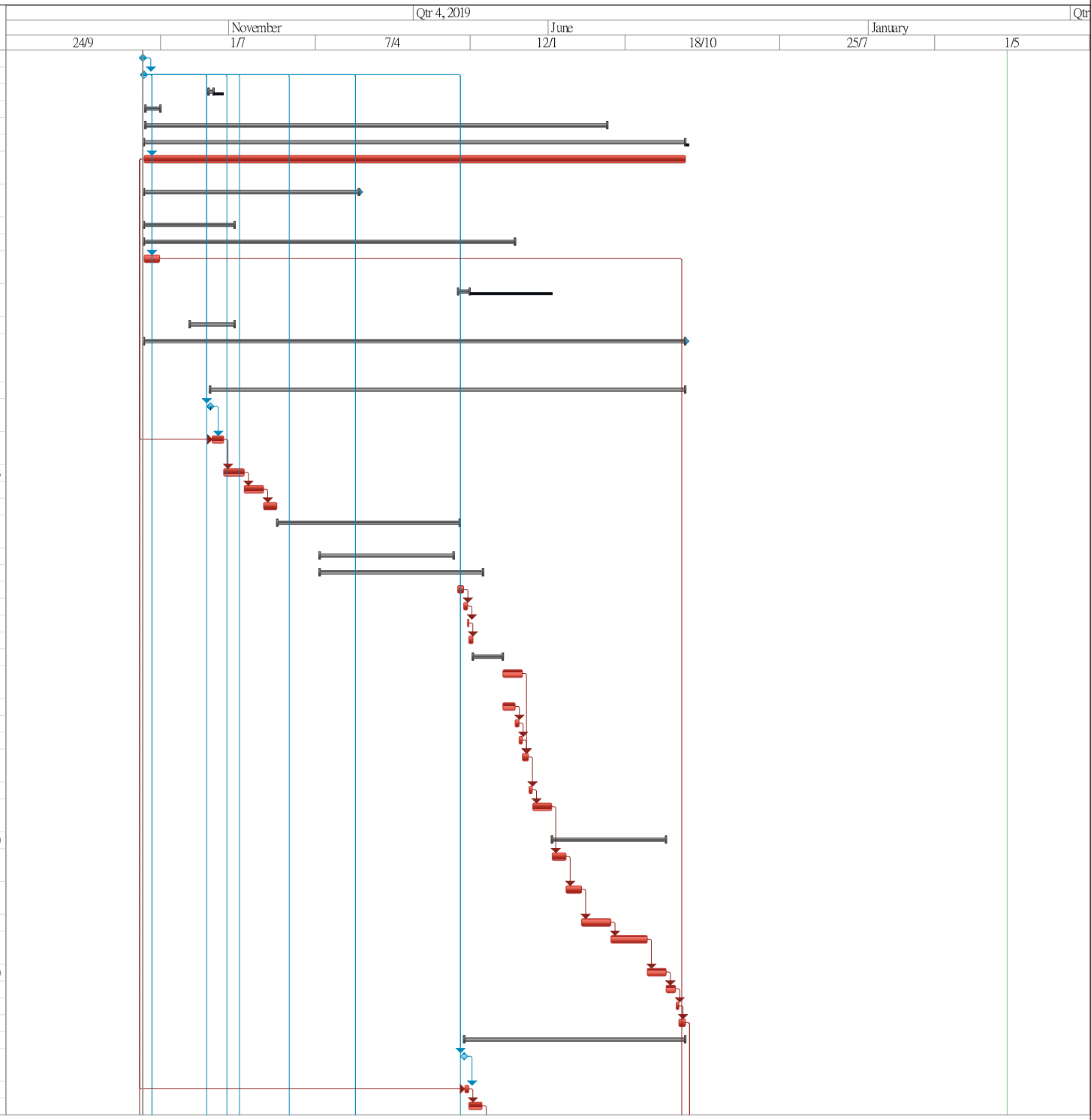
Task | Summary | Progress | Inactive Milestone | Manual Task | Manual Summary Rollup | Start-only | Manual Progress
Milestone | Critical | Inactive Task | Inactive Summary | Duration-only | Manual Summary | Finish-only

Three Months Rolling Programme of

Contract CV/2017/02

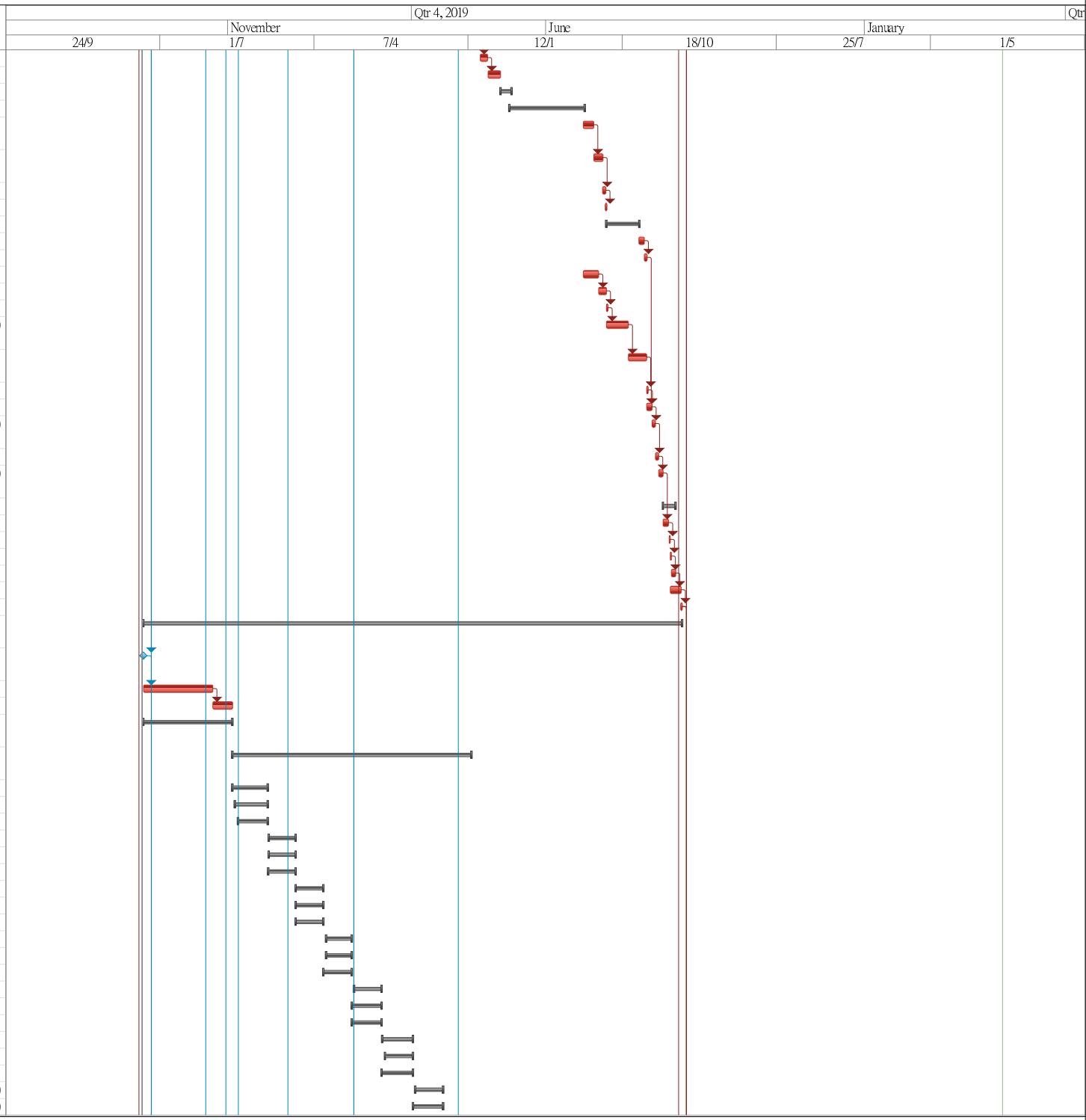
3 Month Rolling Programme
(from 26/7/2022 to 25/10/2022)

ID	WBS	Task Name	Duration	Start Date	Completion Date
1	1	**Letter of Acceptance**	0 days	Wed 30/5/18	Wed 30/5/18
2	2	**Starting Date**	0 days	Thu 31/5/18	Thu 31/5/18
3	3	ET Submissions	9 days	Wed 26/9/18	Fri 5/10/18
12	4	Applications to Government Department	27 days	Mon 4/6/18	Sat 30/6/18
20	5	Submissions & acceptances	835 days	Mon 4/6/18	Tue 15/9/20
44	6	Liaison with Utility Undertakers	979 days	Fri 1/6/18	Wed 3/2/21
47	7	Liaison with Contract CV/2016/01 regarding Parts A1 to A4 (refer PS Appendix A1)	979 days	Fri 1/6/18	Wed 3/2/21
48	8	Liaison Meeting with Interface and associated contractors	389 days	Fri 1/6/18	Mon 24/6/19
53	9	Tree Survey Reporting	164 days	Fri 1/6/18	Sun 11/11/18
58	10	Street Lighting Designs by the Contractor	671 days	Fri 1/6/18	Wed 1/4/20
66	11	Provision of Project Manager's Site Accommodation (PS1.08A(b) & 1.49)	28 days	Fri 1/6/18	Thu 28/6/18
67	12	Design of irrigation system within the Sandy Ridge Cemetery (LS/2021, 2041, 2042, W/1041,1011)	21 days	Fri 20/12/19	Fri 10/1/20
70	13	Condition Survey	81 days	Thu 23/8/18	Sun 11/11/18
77	**14**	**section 1 of the works - Completion of all works within Parts A1, A2 and B of the Site except Establishment works**	979 days	Thu 31/5/18	Wed 3/2/21
78	14.1	**Parts A1**	859 days	Fri 28/9/18	Wed 3/2/21
79	14.1.1	*access date for section 1 (Parts A1) - not more than 120 days after the starting date*	0 days	Fri 28/9/18	Fri 28/9/18
80	14.1.2	form temporary haul road from the south side to Parts A1	14 days	Tue 2/10/18	Mon 22/10/18
81	14.1.3	general site clearance	30 days	Tue 23/10/18	Wed 28/11/18
82	14.1.4	initial survey	27 days	Thu 29/11/18	Wed 2/1/19
83	14.1.5	construction of temporary drainage	21 days	Thu 3/1/19	Sat 26/1/19
84	**14.1.6**	Site Formation works for Cut Slope CS22 (in Parts A1)	258 days	Mon 28/1/19	Mon 23/12/19
101	14.1.7	A1) Construction of Retaining Wall RW13 (bays 1 to	192 days	Mon 15/4/19	Thu 12/12/19
125	**14.1.8**	Site Formation works for Fill Slope FS18	231 days	Mon 15/4/19	Mon 3/2/20
136	14.1.9	CS21 - slope cutting	7 days	Fri 20/12/19	Mon 30/12/19
137	14.1.10	install instrument for CS21	5 days	Tue 31/12/19	Mon 6/1/20
138	14.1.11	placement of erosion control mat/ hydroseeding	2 days	Tue 7/1/20	Wed 8/1/20
139	14.1.12	minor cutting CS26 (Parts A1) (for Road E)	7 days	Thu 9/1/20	Thu 16/1/20
140	14.1.13	Drainage works at Road E	43 days	Fri 17/1/20	Tue 10/3/20
143	14.1.14	Waterworks at Road E	24 days	Wed 11/3/20	Tue 14/4/20
144	14.1.15	CS23 - slope cutting & 300U channel	17 days	Wed 11/3/20	Wed 1/4/20
145	14.1.16	install instrument for CS23	5 days	Thu 2/4/20	Wed 8/4/20
146	14.1.17	placement of erosion control mat/ hydroseeding	2 days	Thu 9/4/20	Tue 14/4/20
147	14.1.18	backfilling of pipe trench to formation (including SRT test)	9 days	Wed 15/4/20	Sat 25/4/20
148	14.1.19	300U channel behind RW13	4 days	Mon 27/4/20	Sat 2/5/20
149	14.1.20	300U channel and planter wall at south side of Road E	30 days	Mon 4/5/20	Sat 6/6/20
150	14.1.21	Roadworks of Road E (A1-ch66-243)	164 days	Mon 8/6/20	Wed 30/12/20
151	14.1.21.1	ducting for road lighting (RD/2091) & construction of irrigation system	20 days	Mon 8/6/20	Thu 2/7/20
152	14.1.21.2	kerbing, sub-base (include subbase SRT test) & cross road duct (RD/2061, 2081)	24 days	Fri 3/7/20	Thu 30/7/20
153	14.1.21.3	concrete pavement	45 days	Fri 31/7/20	Mon 21/9/20
154	14.1.21.4	traffic signs, directional signs, type 2 railing, emergency crash gate, beam barriers	48 days	Tue 22/9/20	Thu 26/11/20
155	14.1.21.5	concrete footpath	27 days	Fri 27/11/20	Wed 30/12/20
156	14.1.22	street lighting (Drg/ RD/2091)	14 days	Thu 31/12/20	Sat 16/1/21
157	14.1.23	landscaping (hydroseeding)	5 days	Mon 18/1/21	Fri 22/1/21
158	14.1.24	landscaping (shrub planting)	10 days	Sat 23/1/21	Wed 3/2/21
159	14.2	**Parts A2**	400 days	Tue 31/12/19	Wed 3/2/21
160	**14.2.1**	*access date for section 1 (Parts A2) - not more than 580 days after the starting date*	0 days	Tue 31/12/19	Tue 31/12/19
161	14.2.2	form temporary haul road to Parts A2	6 days	Thu 2/1/20	Wed 8/1/20
162	14.2.3	general site clearance	18 days	Thu 9/1/20	Sat 1/2/20



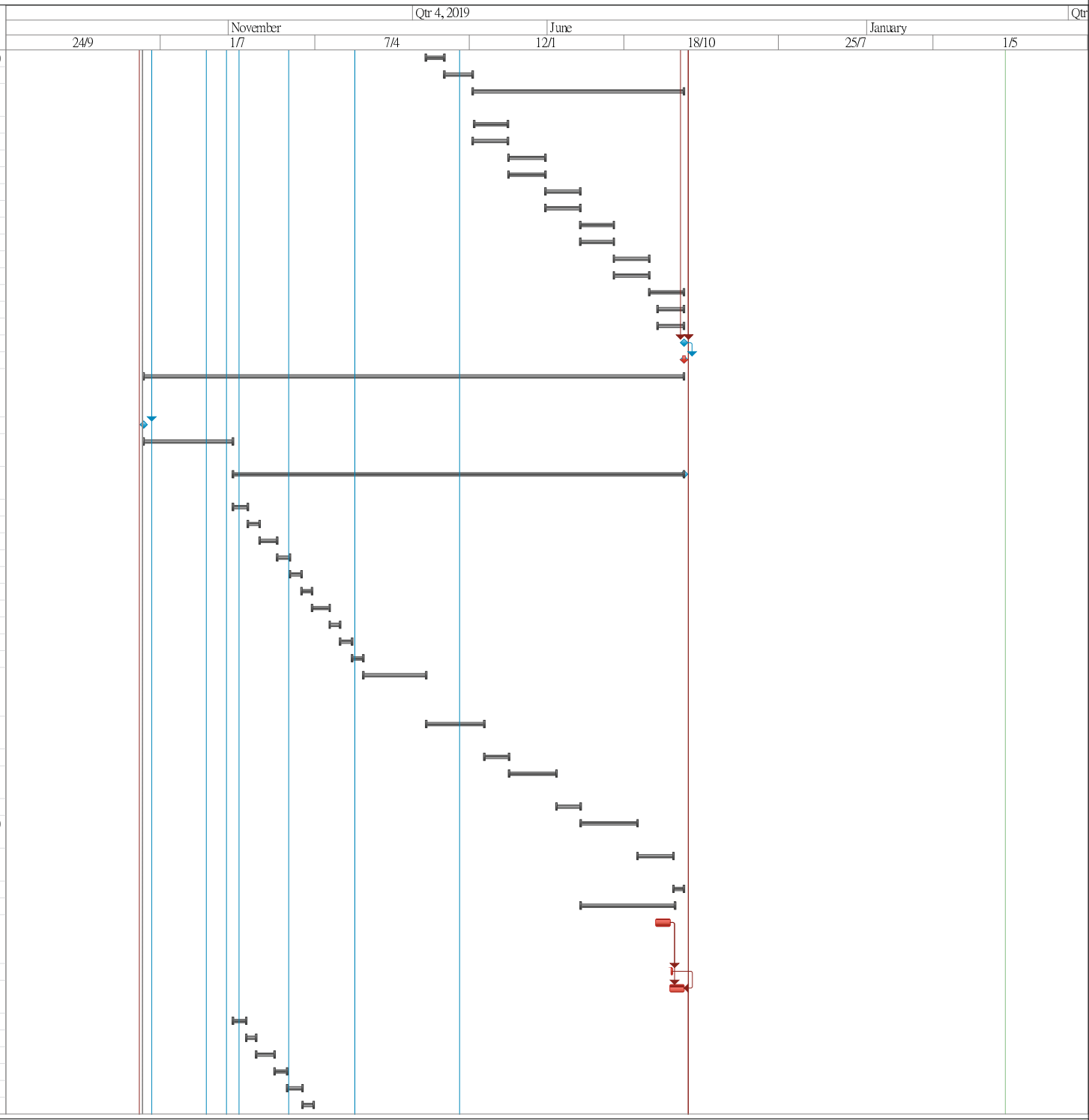
3 Month Rolling Programme
(from 26/7/2022 to 25/10/2022)

ID	WBS	Task Name	Duration	Start Date	Completion Date
163	14.2.4	initial survey	12 days	Mon 3/2/20	Sat 15/2/20
164	14.2.5	construction of temporary drainage	20 days	Mon 17/2/20	Tue 10/3/20
165	14.2.6	Site Formation works for Cut Slope CS22 (in Parts A:	15 days	Wed 11/3/20	Mon 30/3/20
174	14.2.7	Construction of Retaining Wall RW13 Bay 6 to Bay 8	107 days	Fri 27/3/20	Mon 10/8/20
199	14.2.8	(west) drainage works at Road E (ch250 to 300)	16 days	Sat 8/8/20	Wed 26/8/20
200	14.2.9	(west) waterworks at Road E (ch250 to 300)	15 days	Thu 27/8/20	Sat 12/9/20
201	14.2.10	construction of Irrigation System	5 days	Sat 12/9/20	Thu 17/9/20
202	14.2.11	U channel for Road E	3 days	Thu 17/9/20	Sat 19/9/20
203	14.2.12	Roadworks of Road E (A2-ch243-300)	42 days	Sat 19/9/20	Tue 17/11/20
209	14.2.13	street lighting for Road E (Drg/ RD/2091)	9 days	Tue 17/11/20	Thu 26/11/20
210	14.2.14	landscaping (shrub planting)	4 days	Fri 27/11/20	Tue 1/12/20
211	14.2.15	site formation works for Cut Slope CS26 (A2)	24 days	Sat 8/8/20	Fri 4/9/20
212	14.2.16	site formation works for Cut Slope CS25 (A2)	12 days	Sat 5/9/20	Fri 18/9/20
213	14.2.17	placement of erosion control mat/ hydroseeding	2 days	Sat 19/9/20	Mon 21/9/20
214	14.2.18	drainage works at Road B & sewerage works at Road B	28 days	Sat 19/9/20	Wed 28/10/20
215	14.2.19	waterworks at Road B	25 days	Thu 29/10/20	Mon 30/11/20
216	14.2.20	backfill formation for Road B	3 days	Tue 1/12/20	Thu 3/12/20
217	14.2.21	street lighting ducts and drawpits at Road B	9 days	Tue 1/12/20	Thu 10/12/20
218	14.2.22	arrange Town Gas to lay cables (NOT YET AGREED)	5 days	Fri 11/12/20	Wed 16/12/20
219	14.2.23	planter wall for Road B	5 days	Thu 17/12/20	Tue 22/12/20
220	14.2.24	arrange HKT to lay PCCW cables (NOT YET AGREED)	5 days	Wed 23/12/20	Wed 30/12/20
221	14.2.25	Roadworks of Road B (A2-ch28.5-90)	19 days	Thu 31/12/20	Fri 22/1/21
222	14.2.25.1	kerbing & sub-base (include sub-base SRT test)	8 days	Thu 31/12/20	Sat 9/1/21
223	14.2.25.2	DBM (Roadbase)	2 days	Mon 11/1/21	Tue 12/1/21
224	14.2.25.3	base course and wearing course	2 days	Wed 13/1/21	Thu 14/1/21
225	14.2.25.4	directional sign, roadmarkings & footpath	7 days	Fri 15/1/21	Fri 22/1/21
226	14.2.26	landscaping (hydroseeding)	17 days	Wed 13/1/21	Mon 1/2/21
227	14.2.27	landscaping (shrub planting)	3 days	Mon 1/2/21	Wed 3/2/21
228	14.3	**Parts B - refer Appendix MKTR01A & Appendix MKTR01B**	979 days	Thu 31/5/18	Wed 3/2/21
229	14.3.1	*access date for section 1 (Parts B) - the starting date*	0 days	Thu 31/5/18	Thu 31/5/18
230	14.3.2	Initial Survey	104 days	Fri 1/6/18	Thu 4/10/18
231	14.3.3	utility detection and submit reports	30 days	Fri 5/10/18	Fri 9/11/18
232	14.3.4	Temporary Traffic Arrangement (TTA) Scheme for Man Kam Road	134 days	Fri 1/6/18	Fri 9/11/18
236	14.3.5	Construction of Fresh Water Mains (DN400)-refer to Drawings No. MKTR Programme/W/001 & 002	352 days	Sat 10/11/18	Fri 17/1/20
237	14.3.5.1	Phase 1: TTA 1s	52 days	Sat 10/11/18	Sat 12/1/19
246	14.3.5.2	Phase 1: TTA 8s	49 days	Wed 14/11/18	Sat 12/1/19
255	14.3.5.3	Phase 1: TTA 15s	44 days	Tue 20/11/18	Sat 12/1/19
264	14.3.5.4	Phase 2: TTA 2s	39 days	Tue 15/1/19	Mon 4/3/19
273	14.3.5.5	Phase 2: TTA 9s	39 days	Tue 15/1/19	Mon 4/3/19
282	14.3.5.6	Phase 2: TTA 16s	40 days	Mon 14/1/19	Mon 4/3/19
291	14.3.5.7	Phase 3: TTA3s	39 days	Tue 5/3/19	Tue 23/4/19
300	14.3.5.8	Phase 3: TTA10s	39 days	Tue 5/3/19	Tue 23/4/19
309	14.3.5.9	Phase 3: TTA17s	39 days	Tue 5/3/19	Tue 23/4/19
318	14.3.5.10	Phase 4: TTA4s	38 days	Mon 29/4/19	Fri 14/6/19
327	14.3.5.11	Phase 4: TTA11s	38 days	Mon 29/4/19	Fri 14/6/19
336	14.3.5.12	Phase 4: TTA18s	42 days	Wed 24/4/19	Fri 14/6/19
345	14.3.5.13	Phase 5: TTA5s	42 days	Wed 19/6/19	Wed 7/8/19
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



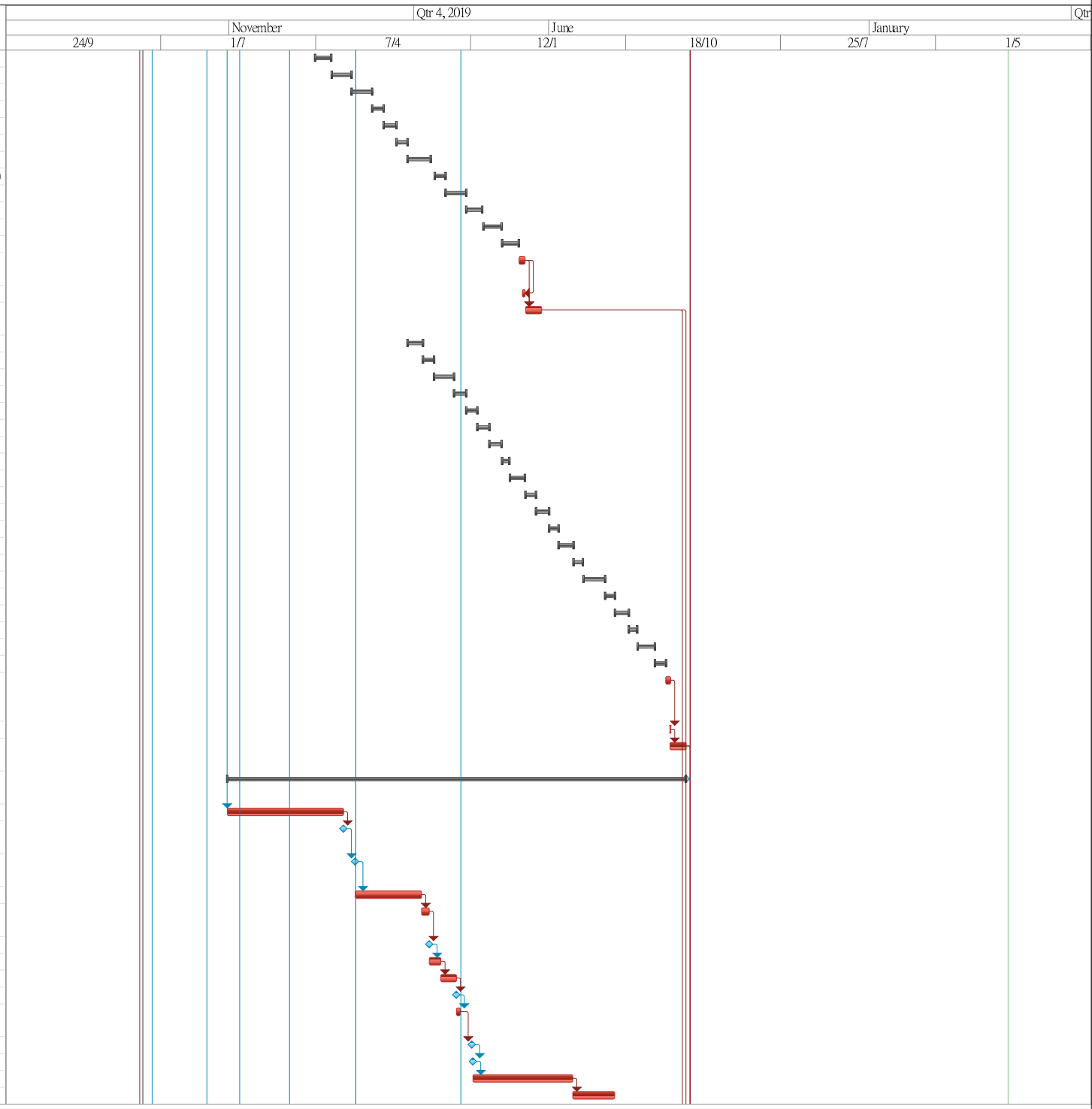
3 Month Rolling Programme
(from 26/7/2022 to 25/10/2022)

ID	WBS	Task Name	Duration	Start Date	Completion Date
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
891	17.3.20	Street lighting (drawpits, abandon existing public lighting & cable, 100uPVC ducts) (ch0-435)	21 days	Mon 14/12/20	Sat 9/1/21
892	17.3.21	tree planting	3 days	Mon 11/1/21	Wed 13/1/21
893	17.3.22	Street furniture & construction of footpath (ch0-435)	22 days	Sat 9/1/21	Wed 3/2/21
894	17.3.23	Phase Ia (stage 101)-south lane (chainage 633-685)	20 days	Sat 10/11/18	Mon 3/12/18
904	17.3.24	Phase Ia (stage 102)-north lane (chainage 633-685)	16 days	Tue 4/12/18	Fri 21/12/18
914	17.3.25	Phase Ia (stage 103)-south lane (chainage 685-740)	25 days	Sat 22/12/18	Wed 23/1/19
925	17.3.26	Phase Ia (stage 104)-north lane (chainage 685-740)	17 days	Thu 24/1/19	Fri 15/2/19
934	17.3.27	Phase Ia (stage 105)-south lane (chainage 740-790)	24 days	Sat 16/2/19	Fri 15/3/19
945	17.3.28	Phase Ia (stage 106) north lane (chainage 740-790)	17 days	Sat 16/3/19	Thu 4/4/19



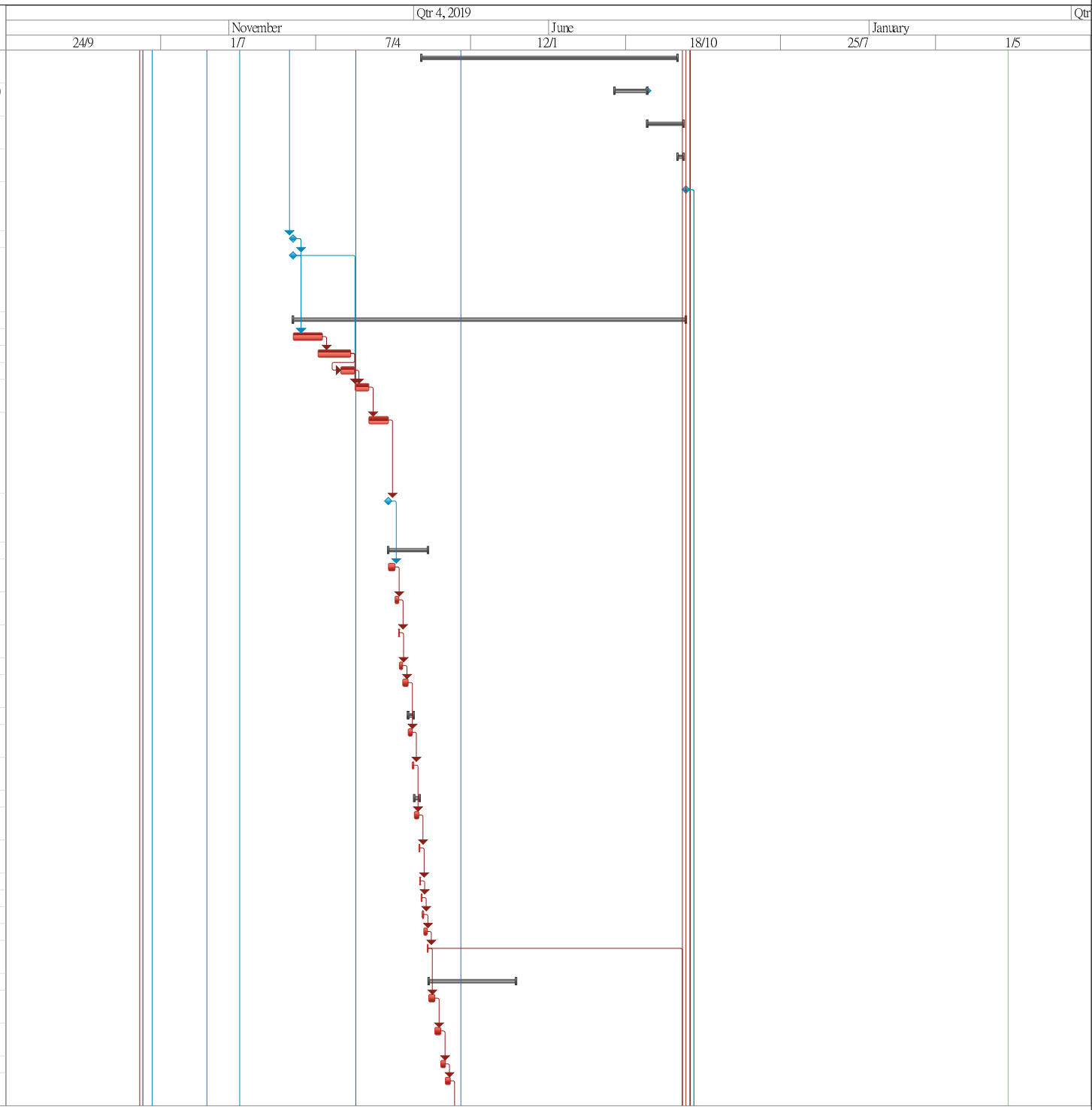
3 Month Rolling Programme
(from 26/7/2022 to 25/10/2022)

ID	WBS	Task Name	Duration	Start Date	Completion Date
955	17.3.29	Phase Ia stage 107)-south lane (chainage 790-840)	21 days	Sat 6/4/19	Sat 4/5/19
966	17.3.30	Phase Ia (stage 108)-north lane (chainage 790-840)	29 days	Mon 6/5/19	Mon 10/6/19
976	17.3.31	Phase Ia (stage 109)-south lane (chainage 840-890)	31 days	Tue 11/6/19	Wed 17/7/19
988	17.3.32	Phase Ia (stage 110)-north lane (chainage 840-890)	18 days	Thu 18/7/19	Wed 7/8/19
998	17.3.33	Phase III (stage 1)-south lane (chainage 435-490)	20 days	Thu 8/8/19	Fri 30/8/19
1009	17.3.34	Phase III (stage 2)-north lane (chainage 435-490)	16 days	Sat 31/8/19	Thu 19/9/19
1019	17.3.35	Phase III (stage 3)-south lane (chainage 490-540)	34 days	Fri 20/9/19	Thu 31/10/19
1030	17.3.36	Phase III (stage 4)-north lane (chainage 490-540)	17 days	Fri 8/11/19	Wed 27/11/19
1039	17.3.37	Phase III (stage 5)-south lane (chainage 540-590)	29 days	Thu 28/11/19	Fri 3/1/20
1049	17.3.38	Phase III (stage 6)-north lane (chainage 540-590)	22 days	Sat 4/1/20	Sat 1/2/20
1059	17.3.39	Phase III (stage 7)-south lane (chainage 590-633)	29 days	Tue 4/2/20	Sat 7/3/20
1069	17.3.40	Phase III (stage 8)-north lane (chainage 590-633)	25 days	Mon 9/3/20	Tue 7/4/20
1079	17.3.41	Street lighting (drawpits, abandon existing public lighting & cable, 100uPVC ducts) (ch435-890)	7 days	Wed 8/4/20	Sat 18/4/20
1080	17.3.42	tree planting	5 days	Tue 14/4/20	Sat 18/4/20
1081	17.3.43	Street furniture & construction of footpath (ch435-890)	23 days	Mon 20/4/20	Mon 18/5/20
1082	17.3.44	Phase IV (stage 1)-south lane (chainage 890-940)	22 days	Fri 20/9/19	Thu 17/10/19
1093	17.3.45	Phase IV (stage 2)-north lane (chainage 890-940)	17 days	Fri 18/10/19	Wed 6/11/19
1103	17.3.46	Phase IV (stage 3)-south lane (chainage 940-983)	31 days	Thu 7/11/19	Thu 12/12/19
1113	17.3.47	Phase IV (stage 4)-north lane (chainage 940-983)	16 days	Fri 13/12/19	Fri 3/1/20
1122	17.3.48	Phase V (stage 1)-south lane (chainage 983-1035)	17 days	Sat 4/1/20	Thu 23/1/20
1132	17.3.49	Phase V (stage 2)-north lane (chainage 983-1035)	16 days	Fri 24/1/20	Fri 14/2/20
1141	17.3.50	Phase V (stage 3)-south lane (chainage 1035-1087)	19 days	Sat 15/2/20	Sat 7/3/20
1151	17.3.51	Phase V (stage 4)-north lane (chainage 1035-1087)	12 days	Mon 9/3/20	Sat 21/3/20
1160	17.3.52	Phase V (stage 5)-south lane (chainage 1087-1139)	20 days	Mon 23/3/20	Sat 18/4/20
1170	17.3.53	Phase V (stage 6)-north lane (chainage 1087-1139)	15 days	Mon 20/4/20	Fri 8/5/20
1179	17.3.54	Phase V (stage 7)-south lane (chainage 1139-1190)	20 days	Sat 9/5/20	Mon 1/6/20
1189	17.3.55	Phase V (stage 8)-north lane (chainage 1139-1190)	15 days	Tue 2/6/20	Thu 18/6/20
1198	17.3.56	Phase VI (stage 1)-south lane (chainage 1190-1240)	21 days	Fri 19/6/20	Wed 15/7/20
1208	17.3.57	Phase VI (stage 2)-north lane (chainage 1190-1240)	15 days	Thu 16/7/20	Sat 1/8/20
1217	17.3.58	Phase VI (stage 3)-south lane (chainage 1240-1286)	34 days	Mon 3/8/20	Thu 10/9/20
1228	17.3.59	Phase VI (stage 4)-north lane (chainage 1240-1286)	15 days	Fri 11/9/20	Mon 28/9/20
1237	17.3.60	Phase VI (stage 5)-south lane (chainage 1286-1332)	20 days	Tue 29/9/20	Fri 23/10/20
1247	17.3.61	Phase VI (stage 6) - north lane (chainage 1286 -133	12 days	Sat 24/10/20	Sat 7/11/20
1254	17.3.62	Phase VI (stage 7)-south lane (chainage 1332-1377)	27 days	Mon 9/11/20	Wed 9/12/20
1266	17.3.63	Phase VI (stage 8)-north lane (chainage 1332-1377)	15 days	Thu 10/12/20	Tue 29/12/20
1275	17.3.64	Street lighting (drawpits, abandon existing public lighting & cable, 100uPVC ducts) (ch890-1377)	7 days	Tue 29/12/20	Wed 6/1/21
1276	17.3.65	tree planting	1 day	Wed 6/1/21	Wed 6/1/21
1277	17.3.66	Street furniture & construction of footpath (ch890-1377)	25 days	Wed 6/1/21	Wed 3/2/21
1278	17.4	Noise Barrier works above the concrete substructure of the noise barrier (section 2 Part C1)	674 days	Mon 29/10/18	Wed 3/2/21
1279	17.4.1	seek specialist subcontractor to design and build	210 days	Mon 29/10/18	Sun 26/5/19
1280	17.4.2	propose specialist subcontractor to PM for acceptance	0 days	Sun 26/5/19	Sun 26/5/19
1281	17.4.3	acceptance of propose specialist subcontractor by Project Manager	0 days	Sun 16/6/19	Sun 16/6/19
1282	17.4.4	prepare design & liaise with designer & PM	120 days	Mon 17/6/19	Mon 14/10/19
1283	17.4.5	submit a proposal detailing the changes to PM's design, if any	14 days	Tue 15/10/19	Mon 28/10/19
1284	17.4.6	submit 1st design for PM's comment	0 days	Mon 28/10/19	Mon 28/10/19
1285	17.4.7	PM's comments	21 days	Tue 29/10/19	Mon 18/11/19
1286	17.4.8	revise design	28 days	Tue 19/11/19	Mon 16/12/19
1287	17.4.9	re-submit design for PM's acceptance	0 days	Mon 16/12/19	Mon 16/12/19
1288	17.4.10	submit 3 sample panels for each type & colour for acceptance	7 days	Tue 17/12/19	Mon 23/12/19
1289	17.4.11	PM's & relevant authorities' acceptance	0 days	Mon 13/1/20	Mon 13/1/20
1290	17.4.12	ordering of noise barrier panel	0 days	Wed 15/1/20	Wed 15/1/20
1291	17.4.13	fabricating of panel and steelworks	180 days	Thu 16/1/20	Mon 13/7/20
1292	17.4.14	delivery of panel and steelworks on site	76 days	Tue 14/7/20	Sun 27/9/20



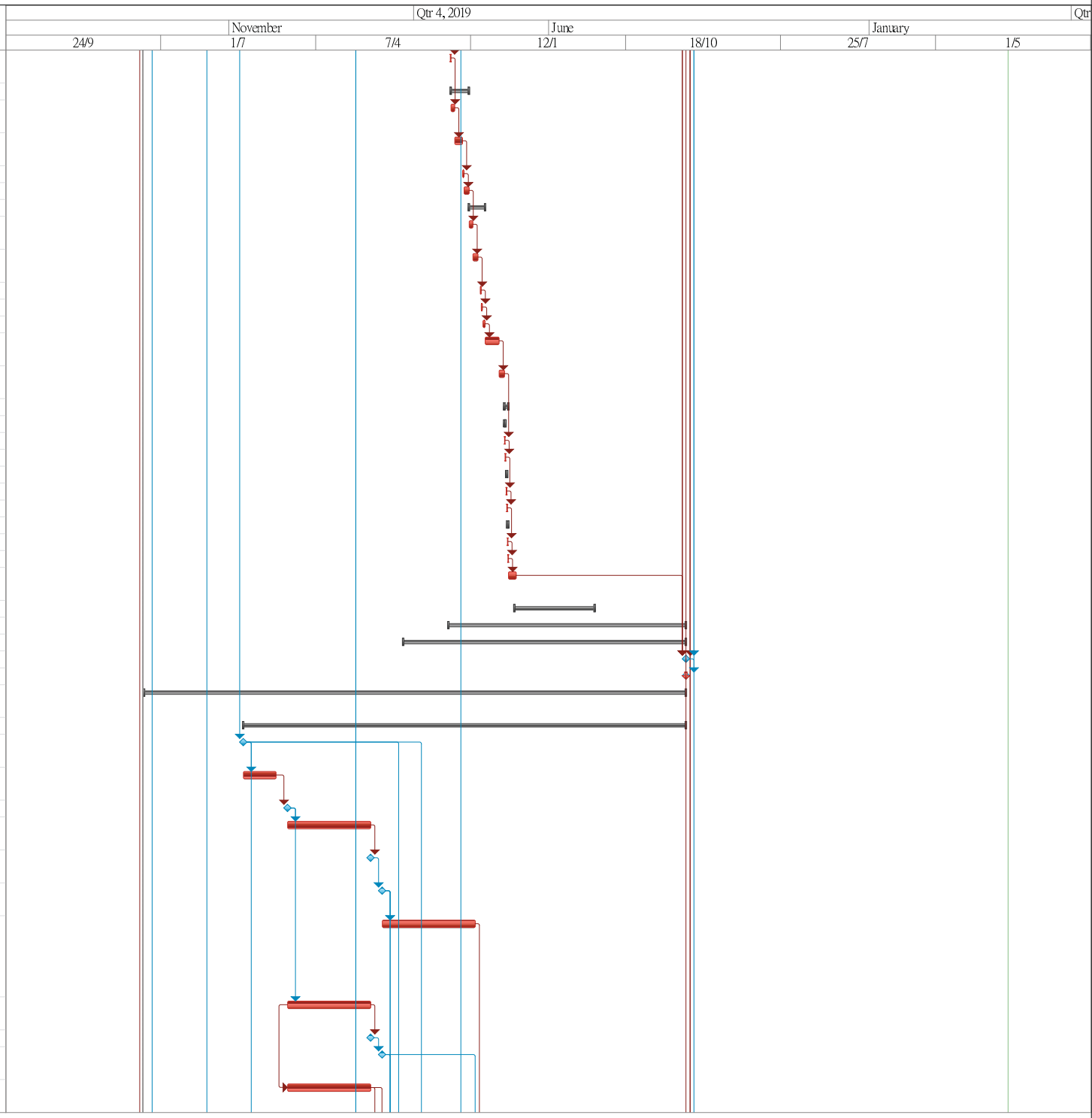
3 Month Rolling Programme
(from 26/7/2022 to 25/10/2022)

ID	WBS	Task Name	Duration	Start Date	Completion Date
1293	17.4.15	completion of concrete curing of substructure of Nosie Barriers	463 days	Mon 14/10/19	Tue 19/1/21
1301	17.4.16	construction works above the concrete substructure of the noise barrier MM6, MM7 & MM9 (app. 77m)	48 days	Mon 28/9/20	Wed 25/11/20
1308	17.4.17	construction works above the concrete substructure of the noise barrier MM10 (app. 94m)	54 days	Thu 26/11/20	Sat 30/1/21
1315	17.4.18	construction works above the concrete substructure of the noise barrier MM5 & MM8 (app. 42.322m)	10 days	Wed 20/1/21	Sat 30/1/21
1322	17.4.19	submit as-built drawings & design calculation & 2 sets of velographs for noise barrier works	0 days	Wed 3/2/21	Wed 3/2/21
1323	17.5	*access date for section 2 (Part C2)*	0 days	Sun 24/2/19	Sun 24/2/19
1324	17.6	**additional site possession for areas outside site boundary {for 3NW-C/C470 (existing D-DH7), C224 (existing D-DH11) & C225 new drillholes DHA1,A2 & A3 }**	0 days	Sun 24/2/19	Sun 24/2/19
1325	17.7	**Slope Upgrading works (section 2 Part C2)**	578 days	Mon 25/2/19	Wed 3/2/21
1326	17.7.1	general site clearance	45 days	Mon 25/2/19	Thu 18/4/19
1327	17.7.2	Initial topographic survey	45 days	Thu 11/4/19	Sat 8/6/19
1328	17.7.3	utility detection and submit reports	21 days	Wed 22/5/19	Sat 15/6/19
1329	17.7.4	drilling of verification boreholes DHA1,A2 & A3	21 days	Mon 17/6/19	Thu 11/7/19
1330	17.7.5	baseline monitoring for 3NW-C/C230 (DH15 & 16) & C225 (DH3 & 17) on existing drillholes & 3NW-C/C470 (existing D-DH7), C224 (existing D-DH11) & C225 proposed verification drillholes DHA1,A2 & A3	30 days	Fri 12/7/19	Thu 15/8/19
1331	17.7.6	submit 4 sets of initial readings of baseline monitoring and preliminary logs to the Project Manager to the Project Manager	0 days	Thu 15/8/19	Thu 15/8/19
1332	17.7.7	**Slopeworks: 3NW-C/C470 (ch490-540S/B)**	59 days	Fri 16/8/19	Sat 26/10/19
1333	17.7.7.1	removal of existing trees	10 days	Fri 16/8/19	Tue 27/8/19
1334	17.7.7.2	hoarding & fencing	6 days	Wed 28/8/19	Tue 3/9/19
1335	17.7.7.3	slope excavation works	1 day	Wed 4/9/19	Wed 4/9/19
1336	17.7.7.4	temporary scaffolding	5 days	Thu 5/9/19	Tue 10/9/19
1337	17.7.7.5	proposed slope stripping for mapping or rock and relict discontinuities (AS5-A,B, AS6-A,B)	8 days	Wed 11/9/19	Fri 20/9/19
1338	17.7.7.6	Phase I	8 days	Sat 21/9/19	Mon 30/9/19
1339	17.7.7.6.1	install test nail PN02 & pull out test	6 days	Sat 21/9/19	Fri 27/9/19
1340	17.7.7.6.2	drill, install steel bars and grout soil nails (B01-12)	2 days	Sat 28/9/19	Mon 30/9/19
1341	17.7.7.7	Phase II	8 days	Wed 2/10/19	Fri 11/10/19
1342	17.7.7.7.1	install test nail PN01 & pull out test	6 days	Wed 2/10/19	Wed 9/10/19
1343	17.7.7.7.2	drill, install steel bars and grout soil nails (A01-17)	2 days	Thu 10/10/19	Fri 11/10/19
1344	17.7.7.8	raking drains	1 day	Sat 12/10/19	Sat 12/10/19
1345	17.7.7.9	TDR Test (including test & wait issue result)	2 days	Mon 14/10/19	Tue 15/10/19
1346	17.7.7.10	soil nail head works	3 days	Wed 16/10/19	Fri 18/10/19
1347	17.7.7.11	UC & catchpit (38m & 1 nr)	5 days	Sat 19/10/19	Thu 24/10/19
1348	17.7.7.12	biodegradable erosion control mat with hydroseeding	2 days	Fri 25/10/19	Sat 26/10/19
1349	17.7.8	**Slopeworks: - 3NW-C/C230 (ch1240-1330S/B)**	130 days	Mon 28/10/19	Thu 2/4/20
1350	17.7.8.1	removal of existing trees	10 days	Mon 28/10/19	Thu 7/11/19
1351	17.7.8.2	hoarding & fencing	9 days	Fri 8/11/19	Mon 18/11/19
1352	17.7.8.3	temporary scaffolding	7 days	Tue 19/11/19	Tue 26/11/19
1353	17.7.8.4	proposed slope stripping for mapping or rock and relict discontinuities (AS3-A,B, AS4-A,B)	8 days	Wed 27/11/19	Thu 5/12/19



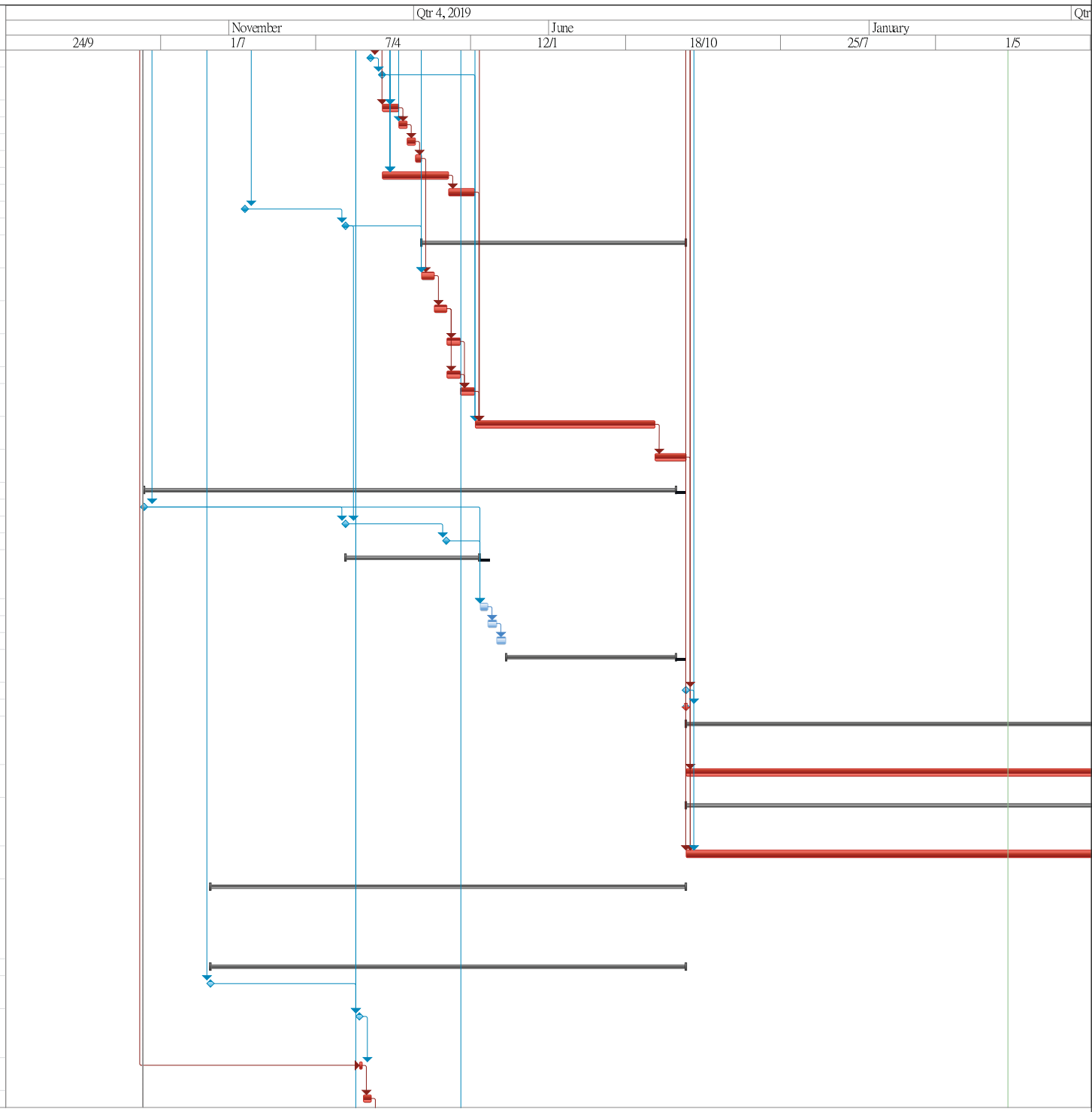
3 Month Rolling Programme
(from 26/7/2022 to 25/10/2022)

ID	WBS	Task Name	Duration	Start Date	Completion Date
1354	17.7.8.5	slope excavation works	1 day	Fri 6/12/19	Fri 6/12/19
1355	17.7.8.6	Phase I	25 days	Sat 7/12/19	Wed 8/1/20
1356	17.7.8.6.1	install test nail PN22 & pull out test	6 days	Sat 7/12/19	Fri 13/12/19
1357	17.7.8.6.2	drill, install steel bars and grout soil nails (K01-22, N01-05, M01-11, J01-25)	10 days	Sat 14/12/19	Fri 27/12/19
1358	17.7.8.6.3	TDR Test (including test & wait issue result)	2 days	Sat 28/12/19	Mon 30/12/19
1359	17.7.8.6.4	soil nail head works	7 days	Tue 31/12/19	Wed 8/1/20
1360	17.7.8.7	Phase II	22 days	Thu 9/1/20	Thu 6/2/20
1361	17.7.8.7.1	install test nail PN21 & pull out test	6 days	Thu 9/1/20	Wed 15/1/20
1362	17.7.8.7.2	drill, install steel bars and grout soil nails (H01-25, L01-16)	8 days	Thu 16/1/20	Fri 24/1/20
1363	17.7.8.7.3	raking drains	2 days	Wed 29/1/20	Thu 30/1/20
1364	17.7.8.7.4	TDR Test (including test & wait issue result)	2 days	Fri 31/1/20	Sat 1/2/20
1365	17.7.8.7.5	soil nail head works	4 days	Mon 3/2/20	Thu 6/2/20
1366	17.7.8.8	225UC, 300SC & catchpits	21 days	Fri 7/2/20	Mon 2/3/20
1367	17.7.8.9	600mm width concrete maintenance staircase with handrailing	9 days	Tue 3/3/20	Thu 12/3/20
1368	17.7.8.10	soil replacement by no-fines concrete	6 days	Fri 13/3/20	Thu 19/3/20
1369	17.7.8.10.1	stage 1	2 days	Fri 13/3/20	Sat 14/3/20
1370	17.7.8.10.1.1	temporary cut & excavation of soil	1 day	Fri 13/3/20	Fri 13/3/20
1371	17.7.8.10.1.2	placement of no-fine concrete	1 day	Sat 14/3/20	Sat 14/3/20
1372	17.7.8.10.2	stage 2	2 days	Mon 16/3/20	Tue 17/3/20
1373	17.7.8.10.2.1	temporary cut & excavation of soil	1 day	Mon 16/3/20	Mon 16/3/20
1374	17.7.8.10.2.2	placement of no-fine concrete	1 day	Tue 17/3/20	Tue 17/3/20
1375	17.7.8.10.3	stage 3	2 days	Wed 18/3/20	Thu 19/3/20
1376	17.7.8.10.3.1	temporary cut & excavation of soil	1 day	Wed 18/3/20	Wed 18/3/20
1377	17.7.8.10.3.2	placement of no-fine concrete	1 day	Thu 19/3/20	Thu 19/3/20
1378	17.7.8.11	biodegradable erosion control mat with hydroseeding & shrub planting	12 days	Fri 20/3/20	Thu 2/4/20
1379	17.7.9	**Slopeworks: - 3NW-C/C224 (ch1040-1120N/B)**	117 days	Tue 31/3/20	Sat 22/8/20
1404	17.7.10	**Slopeworks: - 3NW-C/C225 (ch1300-1376N/B)**	348 days	Tue 3/12/19	Wed 3/2/21
1438	17.7.11	**Slopeworks: - 3NW-C/C231 (ch1220-1240N/B)**	415 days	Thu 12/9/19	Wed 3/2/21
1505	18	Planned Completion for section 2 of the works	0 days	Wed 3/2/21	Wed 3/2/21
1506	19	Completion Date for section 2 of the works	0 days	Wed 3/2/21	Wed 3/2/21
1507	20	**section 3 of the works - Completion of all works within Parts D and E of the Site**	797 days	Thu 31/5/18	Wed 3/2/21
1508	20.1	**Parts D**	800 days	Mon 26/11/18	Wed 3/2/21
1509	20.1.1	*access date for section 3 (Parts D) - not more than 180 days after the starting date*	0 days	Mon 26/11/18	Mon 26/11/18
1510	20.1.2	seek specialist for design, supply and installation of the covered walkway	59 days	Tue 27/11/18	Thu 24/1/19
1511	20.1.3	acceptance of specialist	0 days	Thu 14/2/19	Thu 14/2/19
1512	20.1.4	design for approval for lighting system for the covered walkway	150 days	Fri 15/2/19	Sun 14/7/19
1513	20.1.5	submit for approval for lighting system for the covered walkway	0 days	Sun 14/7/19	Sun 14/7/19
1514	20.1.6	acceptance of lighting system for the covered walkway	0 days	Sun 4/8/19	Sun 4/8/19
1515	20.1.7	Coordination with CLP to obtain the electricity supply for the street lighting system (Design for Road B, Road E, Road F(part), Lin Ma Hang Road and Sheung Shui Landmark PTI & Lighting system for the covered walkway)	168 days	Mon 5/8/19	Sun 19/1/20
1516	20.1.8	design for glazing system of the proposed covered walkway at Fanling Station Road	150 days	Fri 15/2/19	Sun 14/7/19
1517	20.1.9	submission of glazing system	0 days	Sun 14/7/19	Sun 14/7/19
1518	20.1.10	acceptance of glazing system and fall arrest system by Project Manager	0 days	Sun 4/8/19	Sun 4/8/19
1519	20.1.11	design for fall arrest system of the proposed covered walkway at Fanling Station Road	150 days	Fri 15/2/19	Sun 14/7/19



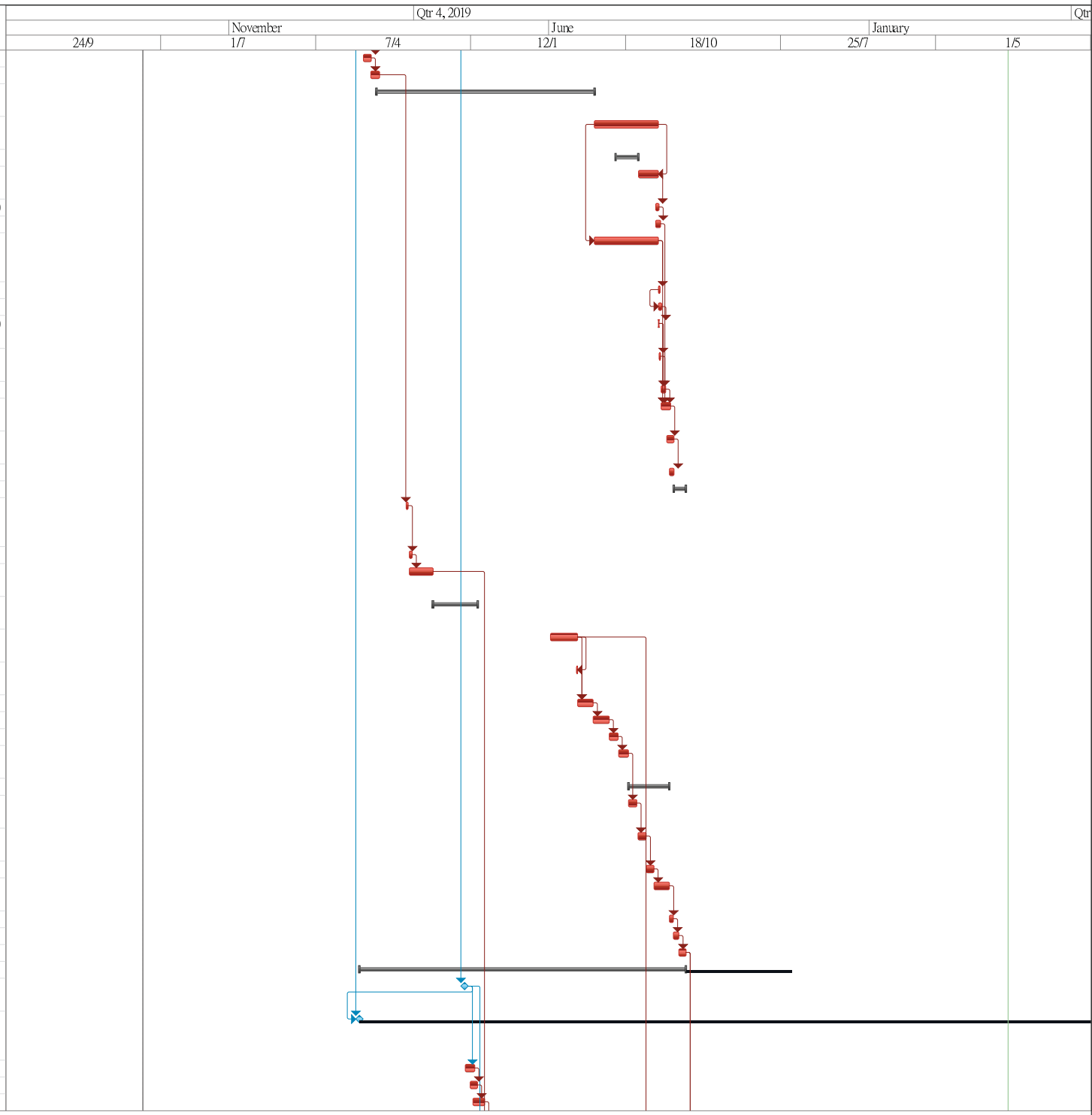
3 Month Rolling Programme
(from 26/7/2022 to 25/10/2022)

ID	WBS	Task Name	Duration	Start Date	Completion Date
1520	20.1.12	submission of fall arrest system	0 days	Sun 14/7/19	Sun 14/7/19
1521	20.1.13	acceptance of fall arrest system by Project Manager	0 days	Sun 4/8/19	Sun 4/8/19
1522	20.1.14	Liaison with MTRC for the works arrangement	30 days	Mon 5/8/19	Tue 3/9/19
1523	20.1.15	general site clearance	12 days	Wed 4/9/19	Wed 18/9/19
1524	20.1.16	initial survey	12 days	Thu 19/9/19	Thu 3/10/19
1525	20.1.17	utility detection and submit reports	8 days	Fri 4/10/19	Mon 14/10/19
1526	20.1.18	Fabrication of Steelworks & glass panel	100 days	Mon 5/8/19	Mon 2/12/19
1527	20.1.19	delivery steelworks & glass panel to site	38 days	Tue 3/12/19	Sat 18/1/20
1528	20.1.20	application of XP (for Parts D)	0 days	Thu 29/11/18	Thu 29/11/18
1529	20.1.21	acceptance of XP (for Parts D)	0 days	Thu 30/5/19	Thu 30/5/19
1530	20.1.22	Construction of Covered Walkway at Fanling Station	390 days	Tue 15/10/19	Wed 3/2/21
1531	20.1.22.1	construct the concrete foundation of covered walkway (first 20m)	20 days	Tue 15/10/19	Wed 6/11/19
1532	20.1.22.2	construct the concrete foundation of covered walkway (2nd 20m)	20 days	Thu 7/11/19	Fri 29/11/19
1533	20.1.22.3	construct the concrete foundation of covered walkway (3rd 20m)	20 days	Sat 30/11/19	Mon 23/12/19
1534	20.1.22.4	demolished existing planter (drg.WY/1051)	20 days	Sat 30/11/19	Mon 23/12/19
1535	20.1.22.5	construct the concrete foundation of covered walkway (4th 20m)	20 days	Tue 24/12/19	Sat 18/1/20
1536	20.1.22.6	construction of covered walkway including steelworks, glass panel and electrical works	265 days	Mon 20/1/20	Wed 9/12/20
1537	20.1.22.7	Reinstatement of the pavement and street furniture	45 days	Thu 10/12/20	Wed 3/2/21
1538	20.2	**Parts E**	782 days	Thu 31/5/18	Sat 16/1/21
1539	20.2.1	*access date for section 3 (Parts E)*	0 days	Thu 31/5/18	Thu 31/5/18
1540	20.2.2	application of XP (for Parts E)	0 days	Thu 30/5/19	Thu 30/5/19
1541	20.2.3	acceptance of XP (for Parts E)	0 days	Thu 28/11/19	Thu 28/11/19
1542	20.2.4	Temporary Traffic Arrangement (TTA) Scheme for Sheung Shui Landmark North PTI and Fanling Station Road	242 days	Fri 31/5/19	Mon 27/1/20
1546	20.2.5	general site clearance	12 days	Wed 29/1/20	Tue 11/2/20
1547	20.2.6	initial Survey	14 days	Wed 12/2/20	Thu 27/2/20
1548	20.2.7	utility detection and submit reports	14 days	Fri 28/2/20	Sat 14/3/20
1549	20.2.8	Road Improvement works at Sheung Shui Landmark North PTI	250 days	Mon 16/3/20	Sat 16/1/21
1559	21	Planned Completion for section 3 of the works	0 days	Wed 3/2/21	Wed 3/2/21
1560	22	Completion Date for section 3 of the works	0 days	Wed 3/2/21	Wed 3/2/21
1561	23	**section 4 of the works - Completion of Establishment works for the Landscape Softworks within Parts A1, A2 and B of the Site**	1095 days	Thu 4/2/21	Sat 3/2/24
1562	23.1	Establishment works for the Landscape Softworks within Parts A1, A2 and B of the Site	1095 days	Thu 4/2/21	Sat 3/2/24
1565	26	**section 5 of the works - Completion of Establishment works for the Landscape Softworks within Parts C1 and C2 of the Site**	1095 days	Thu 4/2/21	Sat 3/2/24
1566	26.1	Establishment works for the Landscape Softworks within Parts C1 and C2 of the Site	1095 days	Thu 4/2/21	Sat 3/2/24
1569	**29**	**section 6 of the works (section Subject to Excision) - Completion of all works within Parts A3 and A4 of the Site except Establishment works. Extent of works under section 6 of the works is defined in Drawing No.: 231448/C2/G/1031**	859 days	Fri 28/9/18	Wed 3/2/21
1570	29.1	**Parts A3**	859 days	Fri 28/9/18	Wed 3/2/21
1571	29.1.1	*access date for section 6 (Part A3) - not more than 120 days after the starting date*	0 days	Fri 28/9/18	Fri 28/9/18
1572	29.1.2	The time for ordering the "section Subject to Excision" for section 6 and 7 is within 390 days commencing from and including the starting date	0 days	Mon 24/6/19	Mon 24/6/19
1573	29.1.3	form temporary haul road from the south side to Parts A3	5 days	Tue 25/6/19	Sat 29/6/19
1574	29.1.4	general site clearance & tree felling	12 days	Tue 2/7/19	Mon 15/7/19



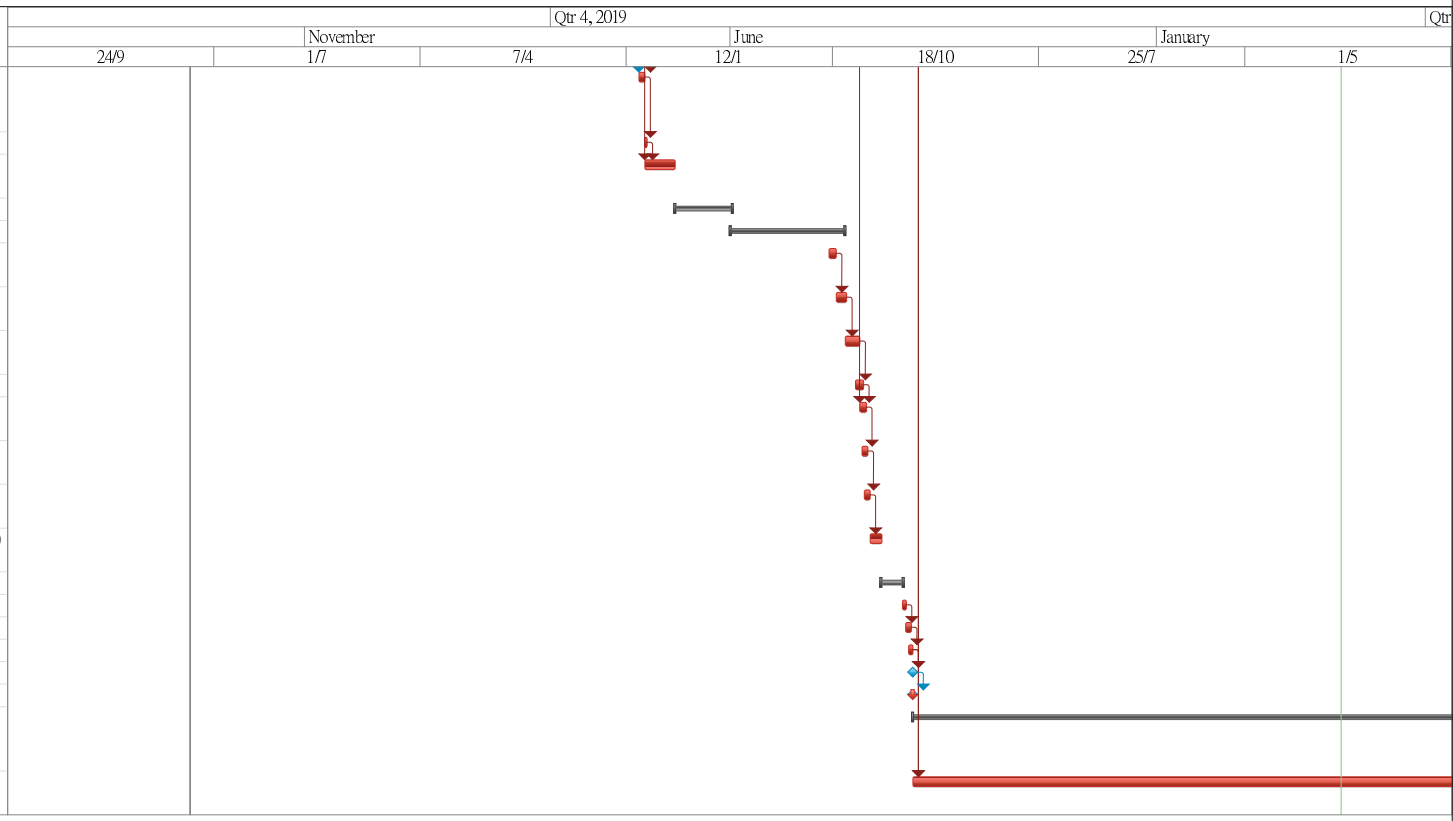
3 Month Rolling Programme
(from 26/7/2022 to 25/10/2022)

ID	WBS	Task Name	Duration	Start Date	Completion Date
1575	29.1.5	initial survey	12 days	Tue 2/7/19	Mon 15/7/19
1576	29.1.6	construction of temporary drainage	14 days	Mon 15/7/19	Tue 30/7/19
1577	29.1.7	**Construction of Retaining Wall RW14 (Bay 1-Bay 6)**	312 days	Fri 26/7/19	Sat 22/8/20
1602	29.1.8	backfilling works behind Retaining Wall RW14 (bay1 to 6) (include SRT tests)	90 days	Sat 22/8/20	Tue 15/12/20
1603	29.1.9	Construction of Retaining Wall RW14 Bay 7	27 days	Wed 30/9/20	Mon 9/11/20
1613	29.1.10	backfilling works behind RW14 (bay 7) (include SRT tests)	30 days	Tue 10/11/20	Tue 15/12/20
1614	29.1.11	install instrument for RW14	5 days	Fri 11/12/20	Wed 16/12/20
1615	29.1.12	construct 300U channel & catchpit in front of RW14	8 days	Fri 11/12/20	Sat 19/12/20
1616	29.1.13	site formation works for fill slope FS19 and FS20 (including in "backfilling works behind Retaining Wall RW14 (bay1 to 6)")	90 days	Sat 22/8/20	Tue 15/12/20
1617	29.1.14	300U channel & stepped channel for FS19 & 20	3 days	Wed 16/12/20	Fri 18/12/20
1618	29.1.15	install instrument for FS19 & FS20	5 days	Wed 16/12/20	Mon 21/12/20
1619	29.1.16	minor site formation works for cut slope CS25	1 day	Wed 16/12/20	Wed 16/12/20
1620	29.1.17	minor site formation works for cut slope CS26	3 days	Thu 17/12/20	Sat 19/12/20
1621	29.1.18	install instruments for CS25 & CS26	5 days	Mon 21/12/20	Mon 28/12/20
1622	29.1.19	waterworks at Road E	12 days	Mon 21/12/20	Wed 6/1/21
1623	29.1.20	drainage works at Road E	10 days	Thu 31/12/20	Tue 12/1/21
1624	29.1.21	U channels at Road E	7 days	Tue 5/1/21	Tue 12/1/21
1625	29.1.22	Roadworks of Road E (ch20-60)	19 days	Wed 13/1/21	Wed 3/2/21
1631	29.1.23	Site Formation works for Cut Slope CS24 (include temporary cutting from top of RW12 to toe of CS24) (for RW12 bays 1-3)	4 days	Tue 17/9/19	Fri 20/9/19
1632	29.1.24	install instrument for CS24	5 days	Mon 23/9/19	Fri 27/9/19
1633	29.1.25	temporary soil nails between CS20 & RW12 (for RW12 bays 1-3)	30 days	Mon 23/9/19	Mon 4/11/19
1634	29.1.26	**Construction of Retaining Wall RW12 CH 0-20**	67 days	Tue 5/11/19	Fri 24/1/20
1657	29.1.27	backfilling along Retaining Wall RW12	40 days	Thu 4/6/20	Wed 22/7/20
1658	29.1.28	Completion of Site Formation works for Cut Slope 25	2 days	Tue 21/7/20	Wed 22/7/20
1659	29.1.29	Waterworks at Road F	24 days	Thu 23/7/20	Wed 19/8/20
1660	29.1.30	Drainage works at Road F	25 days	Thu 20/8/20	Thu 17/9/20
1661	29.1.31	planter wall for Road E and Road F in Parts A3	12 days	Fri 18/9/20	Sat 3/10/20
1662	29.1.32	UU-Arrange Town Gas & PCCW to lay across Road F (not yet agree)	14 days	Mon 5/10/20	Thu 22/10/20
1663	29.1.33	Roadworks of Road F (60m)	55 days	Fri 23/10/20	Mon 4/1/21
1664	29.1.33.1	kerbing and cross road duct (RD/2061, 2081)	10 days	Fri 23/10/20	Fri 6/11/20
1665	29.1.33.2	ducting for road lighting & construction of irrigation system	12 days	Mon 9/11/20	Mon 23/11/20
1666	29.1.33.3	bituminous pavement	12 days	Tue 24/11/20	Mon 7/12/20
1667	29.1.33.4	traffic signs, directional signs, type 2 railing & footpath	21 days	Tue 8/12/20	Mon 4/1/21
1668	29.1.34	street lighting (Drg/ RD/2091)	6 days	Tue 5/1/21	Mon 11/1/21
1669	29.1.35	landscaping (hydroseeding)	9 days	Tue 12/1/21	Thu 21/1/21
1670	29.1.36	landscaping (shrub planting)	11 days	Fri 22/1/21	Wed 3/2/21
1671	29.2	**Parts A4**	590 days	Mon 24/6/19	Wed 3/2/21
1672	29.2.1	*access date for section 6 (Parts A4) - not more than 580 days after the starting date*	0 days	Tue 31/12/19	Tue 31/12/19
1673	29.2.2	The time for ordering the "section Subject to Excision" for section 6 and 7 is within 390 days commencing from and including the starting date	0 days	Mon 24/6/19	Mon 24/6/19
1674	29.2.3	general site clearance	15 days	Thu 2/1/20	Sat 18/1/20
1675	29.2.4	initial survey	11 days	Sat 11/1/20	Thu 23/1/20
1676	29.2.5	construction of temporary drainage	15 days	Thu 16/1/20	Wed 5/2/20



3 Month Rolling Programme
(from 26/7/2022 to 25/10/2022)

ID	WBS	Task Name	Duration	Start Date	Completion Date
1677	29.2.6	Site Formation works for Cut Slope CS24 (include temporary cutting from top of RW12 to toe of CS24) (for RW12 bays 4-6)	7 days	Wed 29/1/20	Wed 5/2/20
1678	29.2.7	install instrument for CS24	3 days	Thu 6/2/20	Sat 8/2/20
1679	29.2.8	temporary soil nails between CS20 & RW12 (for RW12 bays 4-6)	35 days	Thu 6/2/20	Tue 17/3/20
1680	29.2.9	Construction of Retaining Wall RW12 CH 21-40	58 days	Wed 18/3/20	Wed 3/6/20
1703	29.2.10	Site Formation works for Cut Slope CS20	125 days	Mon 1/6/20	Tue 3/11/20
1737	29.2.11	Site Formation works for Cut Slope CS26 (A4)	8 days	Tue 13/10/20	Thu 22/10/20
1738	29.2.12	Site Formation works for Cut Slope CS25 (A4)	9 days	Fri 23/10/20	Thu 5/11/20
1739	29.2.13	complete the construction of U channel at CS 25 and 26	15 days	Wed 4/11/20	Mon 23/11/20
1740	29.2.14	planter wall	10 days	Wed 18/11/20	Sat 28/11/20
1741	29.2.15	Waterworks at Road B	8 days	Tue 24/11/20	Wed 2/12/20
1742	29.2.16	Sewerage works at Road B	7 days	Fri 27/11/20	Fri 4/12/20
1743	29.2.17	Drainage works at Road B	7 days	Mon 30/11/20	Mon 7/12/20
1744	29.2.18	UU - Arrange Town Gas & PCCW to lay cables (not agreed yet)	14 days	Tue 8/12/20	Wed 23/12/20
1745	29.2.19	Roadworks of Road B (A4-ch90-130)	23 days	Wed 23/12/20	Thu 21/1/21
1750	29.2.20	street lighting (Drg/ RD/2091)	4 days	Thu 21/1/21	Mon 25/1/21
1751	29.2.21	landscaping (hydroseeding)	7 days	Mon 25/1/21	Mon 1/2/21
1752	29.2.22	landscaping (shrub planting)	5 days	Fri 29/1/21	Wed 3/2/21
1753	30	Planned Completion for section 6 of the works	0 days	Wed 3/2/21	Wed 3/2/21
1754	31	Completion Date for section 6 of the works	0 days	Wed 3/2/21	Wed 3/2/21
1755	32	**section 7 of the works (section Subject to Excision) - Completion of Establishment works for the Landscape Softworks within Parts A3 and A4 of the**	1095 days	Thu 4/2/21	Sat 3/2/24
1756	32.1	Establishment works for the Landscape Softworks within Parts A3 and A4 of the Site	1095 days	Thu 4/2/21	Sat 3/2/24



Appendix D

Monitoring Locations

Air Quality Monitoring Location

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

Legend

- Project Boundary
- Utilities Construction
- Proposed Air Monitoring Stations

Rev	Description	By	Date
E	FIFTH ISSUE	GL	02/16
D	FOURTH ISSUE	GL	12/15
C	THIRD ISSUE	GL	10/15
B	SECOND ISSUE	GL	02/15

Consultant

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

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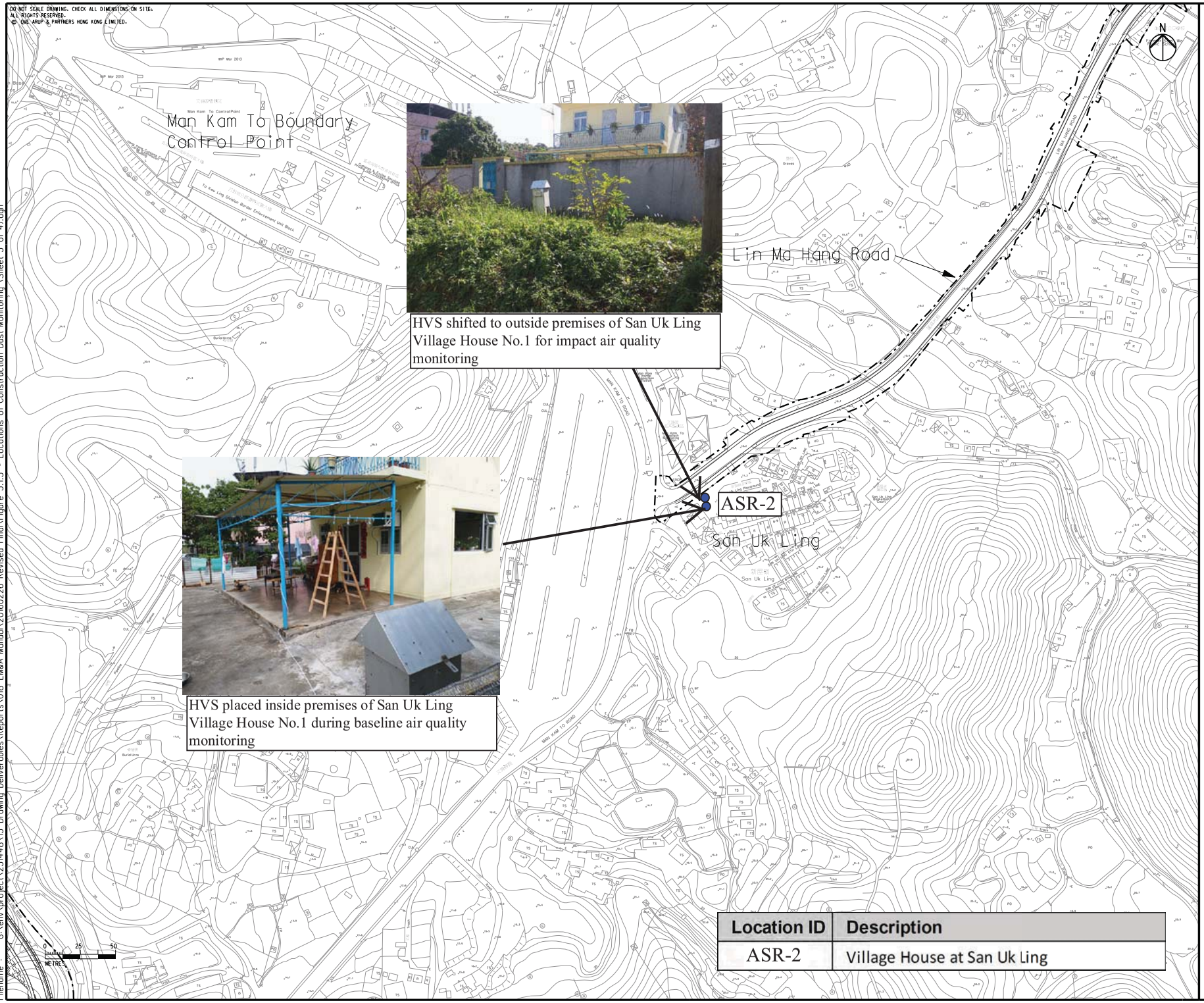

Location ID	Description
ASR-2	Village House at San Uk Ling

Legend

Project Boundary

Existing Air Monitoring Stations

Rev	Description	By	Date
E	FIFTH ISSUE	GL	02/16
D	FOURTH ISSUE	GL	12/15
C	THIRD ISSUE	GL	10/15
B	SECOND ISSUE	GL	02/15

Consultant

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

Figure 1
Air Quality Monitoring Location (ASR-2)

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Filename : G:\env\project\231448\13 Drawing Deliverables\Reports\018 EM&A Manual\20160226 Revised Final\Figure 5.1.3 - Locations of Construction Dust Monitoring (Sheet 3 of 4).dgn

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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

ASR-3a

ASR-3

100m

Muk Wu Nga Yiu

Lin Ma Hang Road

SHAM CHUN RIVER (SHENZHEN HE)

深圳市 SHENZHEN SHI

N

0 25 50 METRES

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

Legend

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

Rev	Description	By	Date
E	FIFTH ISSUE	GL	02/16
D	FOURTH ISSUE	GL	12/15
C	THIRD ISSUE	GL	10/15
B	SECOND ISSUE	GL	02/15

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Contract No. and Title:

Agreement No. CE 1/2013(CE)

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Drawing title

Figure 2
Air Quality Monitoring Location (ASR-3)

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Noise Monitoring Location

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

Legend

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

Rev	Description	By	Date
E	FIFTH ISSUE	GL	02/16
D	FOURTH ISSUE	GL	12/15
C	THIRD ISSUE	GL	10/15
B	SECOND ISSUE	GL	02/15

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

Legend

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

Rev	Description	By	Date
E	FIFTH ISSUE	GL	02/16
D	FOURTH ISSUE	GL	12/15
C	THIRD ISSUE	GL	10/15
B	SECOND ISSUE	GL	02/15

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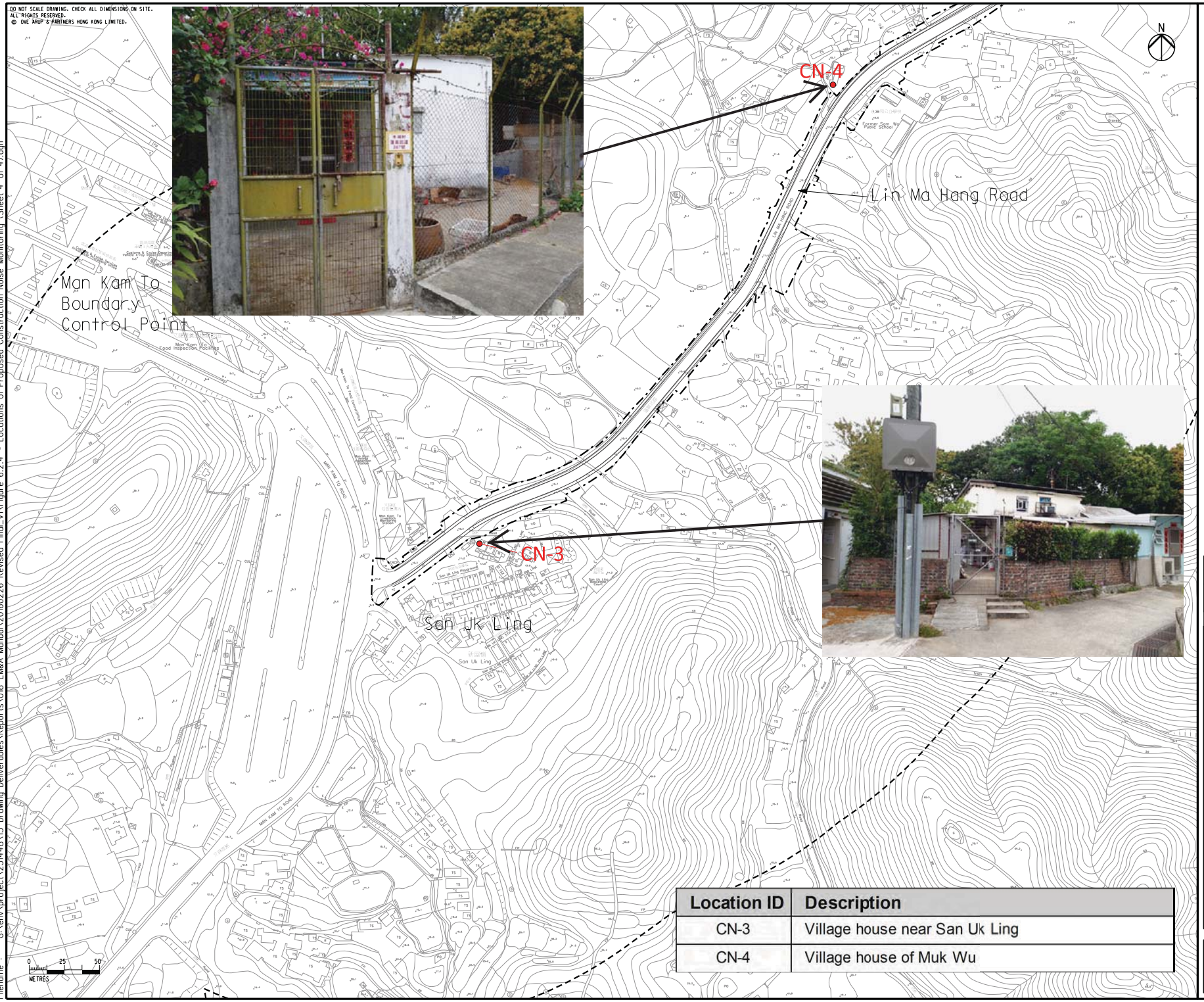

Legend

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

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

Rev	Description	By	Date
E	FIFTH ISSUE	GL	02/16
D	FOURTH ISSUE	GL	12/15
C	THIRD ISSUE	GL	10/15
B	SECOND ISSUE	GL	02/15

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Water Quality Monitoring Station

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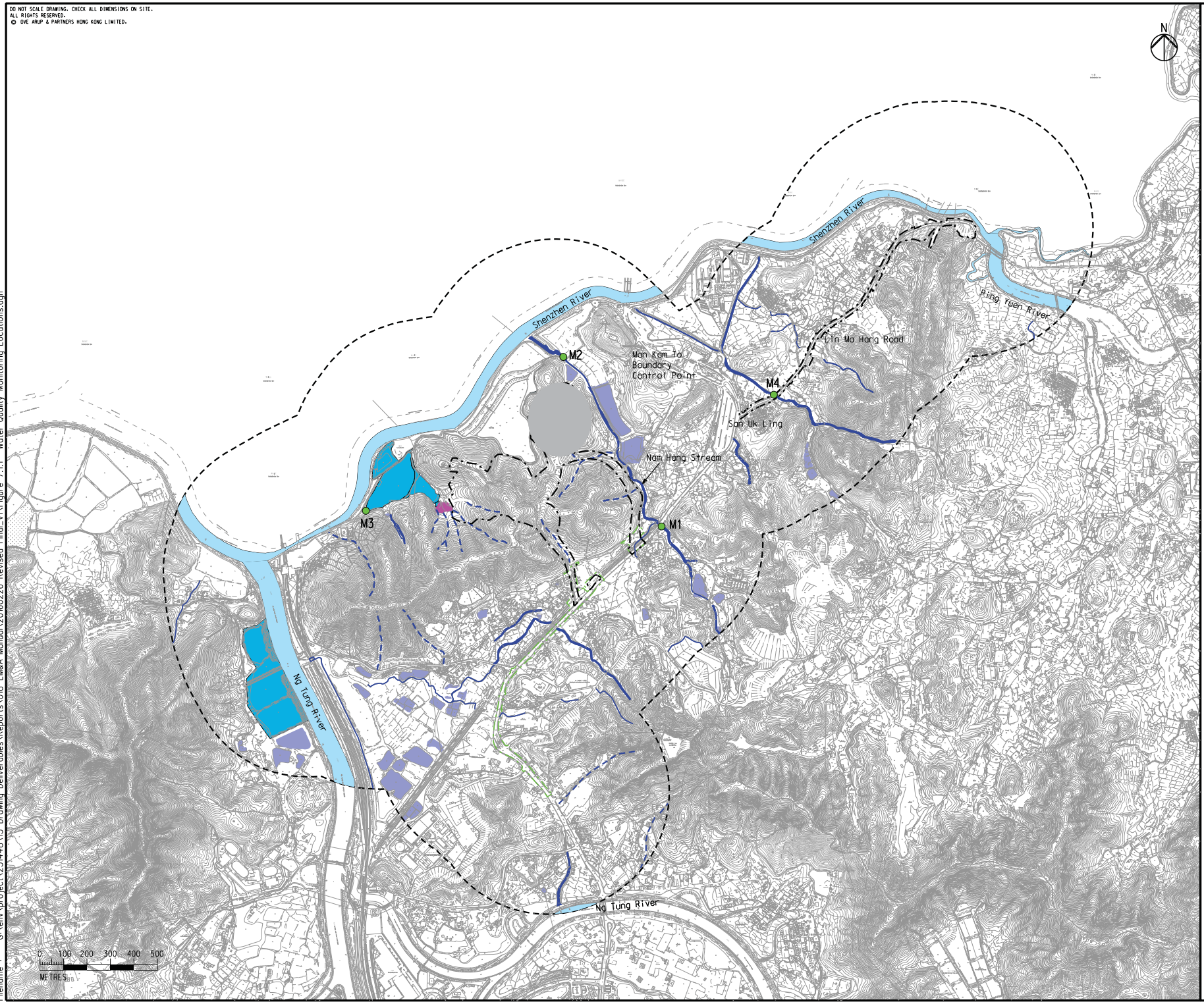

Legend

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

Rev	Description	By	Date
E	FIFTH ISSUE	GL	02/16
D	FOURTH ISSUE	GL	12/15
C	THIRD ISSUE	GL	10/15
B	SECOND ISSUE	GL	02/15

Consultant

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

Drawing title

Water Quality Monitoring Locations

Drawing no.	Rev.
Figure 7.1.1	E

Drawn	Date	Checked	Approved
GL	02/16	EL	ST

Scale	Status
AS SHOWN	PRELIMINARY

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Filename : G:\env\project\231448\13 Drawing Deliverables\Reports\018 EM&A Manual\20160226 Revised Final_v1\Figure 7.1.1 - Water Quality Monitoring Locations.dgn

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	1 Dec 22	14 Dec 22
1b		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for ASR-1	17 Dec 22	30 Dec 22
2		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for ASR-2	1 Dec 22	14 Dec 22
2a		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for ASR-2	17 Dec 22	30 Dec 22
3		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for ASR-3a	1 Dec 22	14 Dec 22
3a		TISCH High Volume Air Sampler, HVS Model TE-5170 TSP Sampler Calibration Spreadsheet for ASR-3a	17 Dec 22	30 Dec 22
4		Calibration Kit TISCH Model TE-5025A Orifice ID 1612 and Rootsmeter 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		Laser Dust Monitor, Model LD-3B (Serial No. 2Y6502) – EQ113	26 Mar 22	26 Mar 23
9	Noise	Rion NL-52 Sound Level Meter (Serial No. 00809405) – EQ018	12 Mar 22	12 Mar 23
10		Rion NL-31 Sound Level Meter (Serial No. 00410221) – EQ067	12 Mar 22	12 Mar 23
11		Rion NC - 73 Acoustical Calibrator (Serial No. 10655561) – EQ085	20 Aug 22	20 Aug 23
12	Water	YSI Professional DSS (Serial No.20J101862)	25 Oct 22	25 Jan 23
13		Global Water FP211 Flow Meter (Serial No. 22B106785)	3 May 22	3 May 23

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Sha Ling Village House No.6 — Date of Calibration: 1-Dec-22
Location ID : ASR-1 — Next Calibration Date: 14-Dec-22
Name and Model: TISCH HVS Model TE-5170 — Technician: Eric Chan

CONDITIONS

Sea Level Pressure (hPa)	1020.5	Corrected Pressure (mm Hg)	765.375
Temperature (°C)	16.5	Temperature (K)	290

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected
18	5.40	5.40	10.8	1.678	61	63.01
13	4.50	4.50	9.0	1.532	54	55.78
10	3.50	3.50	7.0	1.352	48	49.58
7	2.00	2.00	4.0	1.023	40	41.32
5	1.30	1.30	2.6	0.825	30	30.99

LINEAR REGRESSION

Slope =	35.0225
Intercept =	3.2441
Corr. coeff. =	0.9922

Calculations :

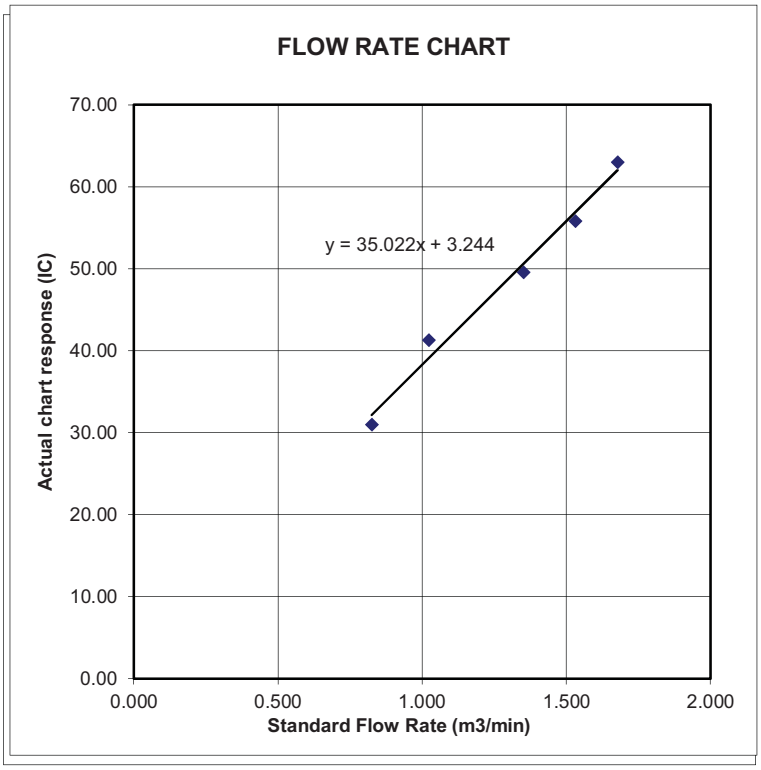
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[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: 1-Dec-22
Location ID : ASR-2 — Next Calibration Date: 14-Dec-22
Name and Model: TISCH HVS Model TE-5170 — Technician: Eric Chan

CONDITIONS

Sea Level Pressure (hPa)	1020.5	Corrected Pressure (mm Hg)	765.375
Temperature (ºC)	16.5	Temperature (K)	290

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION	
18	5.20	5.20	10.4	1.646	55	56.81	Slope =	32.9663
13	4.00	4.00	8.0	1.445	48	49.58	Intercept =	2.7156
10	2.70	2.70	5.4	1.188	42	43.39	Corr. coeff. =	0.9959
7	1.80	1.80	3.6	0.971	34	35.12		
5	1.30	1.30	2.6	0.825	28	28.92		

Calculations :

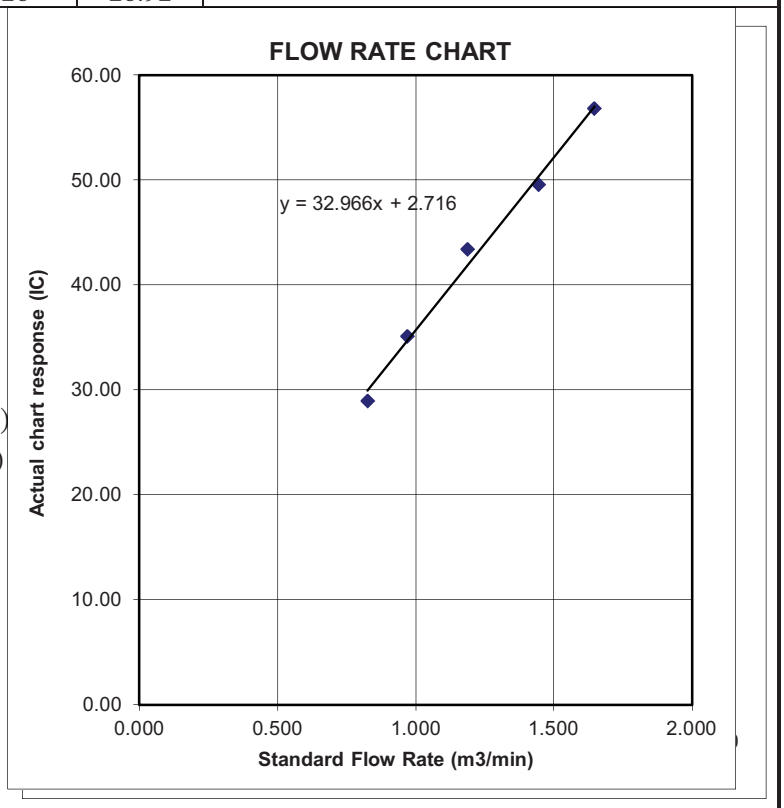
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[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: 1-Dec-22
Location ID : ASR-3a	Next Calibration Date: 14-Dec-22
Name and Model: TISCH HVS Model TE-5170	Technician: Eric Chan

CONDITIONS

Sea Level Pressure (hPa)	1020.5	Corrected Pressure (mm Hg)	765.375
Temperature (°C)	16.5	Temperature (K)	290

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.20	5.20	10.4	1.646	55	56.81	Slope = 33.5250
13	4.20	4.20	8.4	1.480	47	48.55	Intercept = 0.1343
10	3.10	3.10	6.2	1.272	41	42.35	Corr. coeff. = 0.9937
7	2.20	2.20	4.4	1.072	34	35.12	
5	1.30	1.30	2.6	0.825	28	28.92	

Calculations :

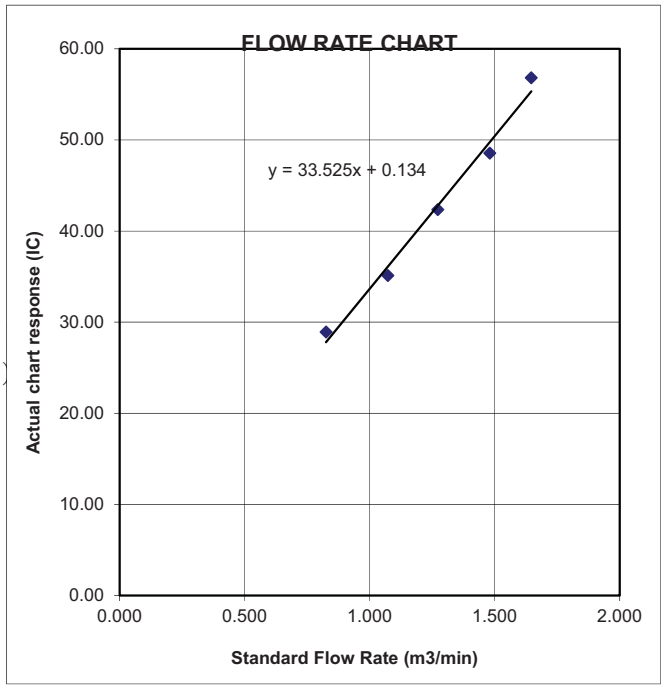
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[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: 17-Dec-22
Location ID : ASR-1 — Next Calibration Date: 30-Dec-22
Name and Model: TISCH HVS Model TE-5170 — Technician: Eric Chan

CONDITIONS

Sea Level Pressure (hPa)	1024.9	Corrected Pressure (mm Hg)	768.675
Temperature (°C)	13.2	Temperature (K)	286

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected
18	5.40	5.40	10.8	1.691	61	63.88
13	4.60	4.60	9.2	1.561	54	56.55
10	3.50	3.50	7.0	1.362	48	50.26
7	2.10	2.10	4.2	1.056	40	41.89
5	1.30	1.30	2.6	0.832	30	31.41

LINEAR REGRESSION

Slope =	35.4240
Intercept =	2.7311
Corr. coeff. =	0.9938

Calculations :

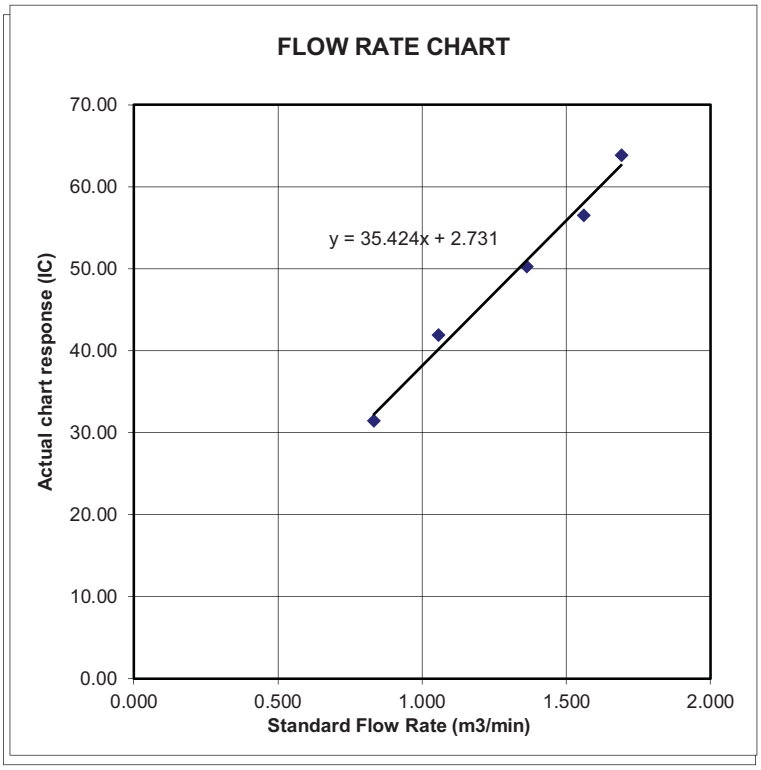
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[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: 17-Dec-22
Location ID : ASR-2 — Next Calibration Date: 30-Dec-22
Name and Model: TISCH HVS Model TE-5170 — Technician: Eric Chan

CONDITIONS

Sea Level Pressure (hPa)	1024.9	Corrected Pressure (mm Hg)	768.675
Temperature (ºC)	13.2	Temperature (K)	286

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION	
18	5.30	5.30	10.6	1.675	55	57.59	Slope =	32.7478
13	4.00	4.00	8.0	1.456	48	50.26	Intercept =	3.0066
10	2.80	2.80	5.6	1.219	42	43.98	Corr. coeff. =	0.9975
7	1.80	1.80	3.6	0.978	34	35.60		
5	1.30	1.30	2.6	0.832	28	29.32		

Calculations :

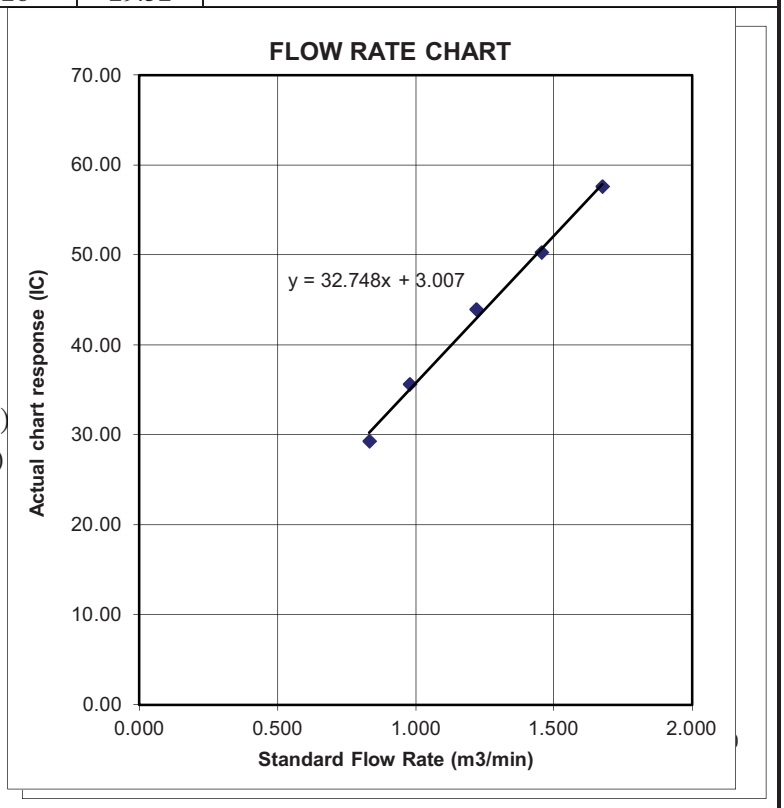
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[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: 17-Dec-22
Location ID : ASR-3a	Next Calibration Date: 30-Dec-22
Name and Model: TISCH HVS Model TE-5170	Technician: Eric Chan

CONDITIONS

Sea Level Pressure (hPa)	1024.9	Corrected Pressure (mm Hg)	768.675
Temperature (°C)	13.2	Temperature (K)	286

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected
18	5.30	5.30	10.6	1.675	55	57.59
13	4.20	4.20	8.4	1.492	47	49.22
10	3.10	3.10	6.2	1.282	41	42.93
7	2.30	2.30	4.6	1.105	34	35.60
5	1.30	1.30	2.6	0.832	28	29.32

LINEAR REGRESSION

Slope = 33.5514
Intercept = 0.0799
Corr. coeff. = 0.9931

Calculations :

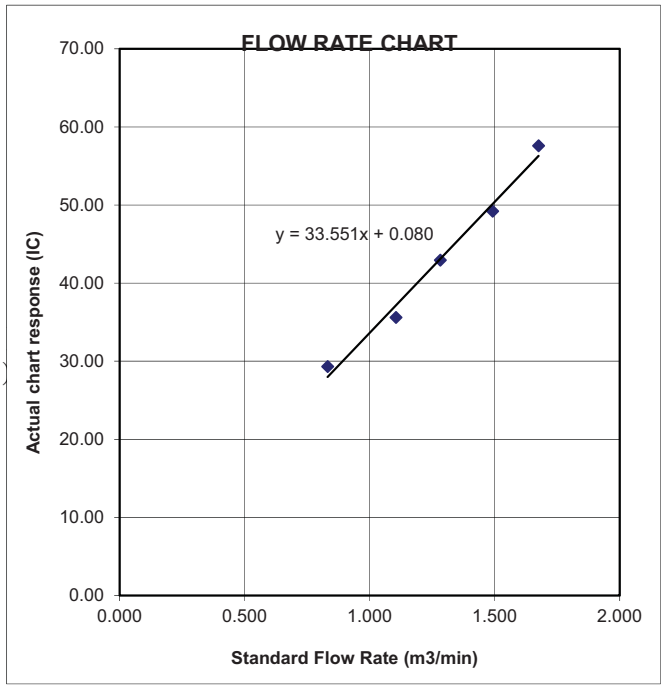
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

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



TISCH Environmental

RECALIBRATION DUE DATE:
December 27, 2022

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)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (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=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

For subsequent flow rate calculations:

$$\textbf{Qstd=}\ 1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$$

$$\textbf{Qa=}\ 1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$$

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

TSI P/N 2300157

CERTIFICATE OF CALIBRATION AND TESTING

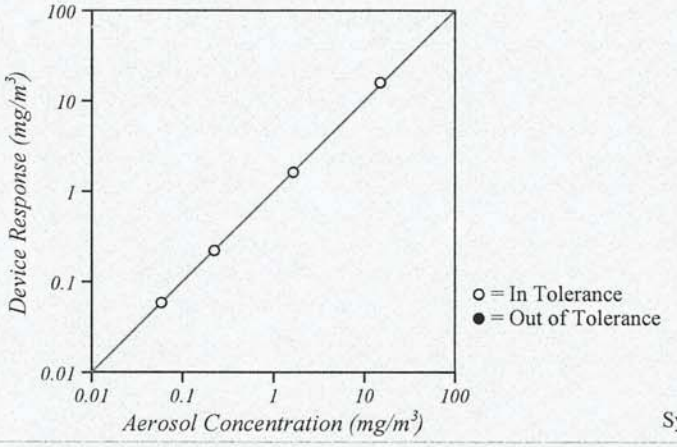
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

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

Model	**AM510**
Serial Number	**11008060**

☒ As Left ☒ In Tolerance
☐ As Found ☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-02

CONCENTRATION *Unit: mg/m3*

#	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

Jim Levin
Calibrated

February 4, 2022
Date

TSI P/N 2300157

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

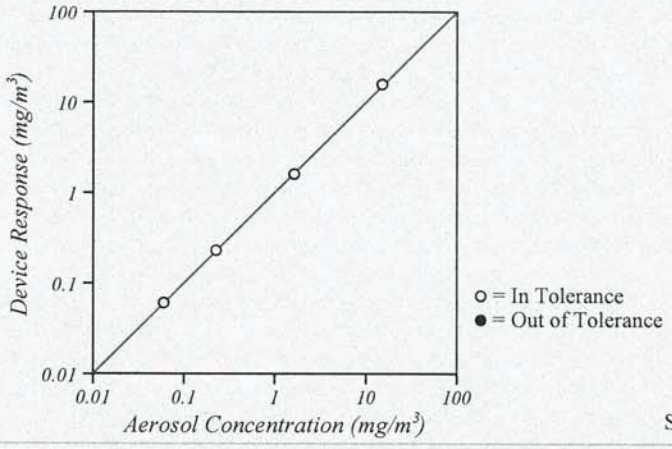
Environment Conditions		
Temperature	76.22 (24.6)	°F (°C)
Relative Humidity	21.7	%RH
Barometric Pressure	29.32 (992.9)	inHg (hPa)

Model	**AM510**
Serial Number	**11008017**

☒ As Left ☐ As Found

☒ In Tolerance ☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-02

CONCENTRATION *Unit: mg/m3*

#	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

Jon Lewin
Calibrated

February 4, 2022
Date

ALS Technichem (HK) Pty Ltd

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)

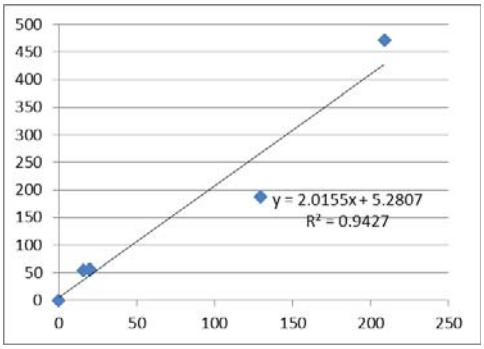
Sensitivity Adjustment Scale Setting (After Calibration) 586 (CPM)

Linear Regression of Y or X

Slope (K-factor): 2.0155 (μg/m^3)/CPM

Correlation Coefficient (R) 0.9709

Date of Issue 15 January 2022



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 2.0155 (μg/m^3)/CPM should be apply for TSP monitoring

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

Operator : Fai So Signature : Date : 15 January 2022

QC Reviewer : Ben Tam 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.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected
18	6.2	6.2	12.4	1.675	52	51.93
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

LINEAR REGRESSION

Slope =	24.2092
Intercept =	10.8881
Corr. coeff. =	0.9959

Calculations :

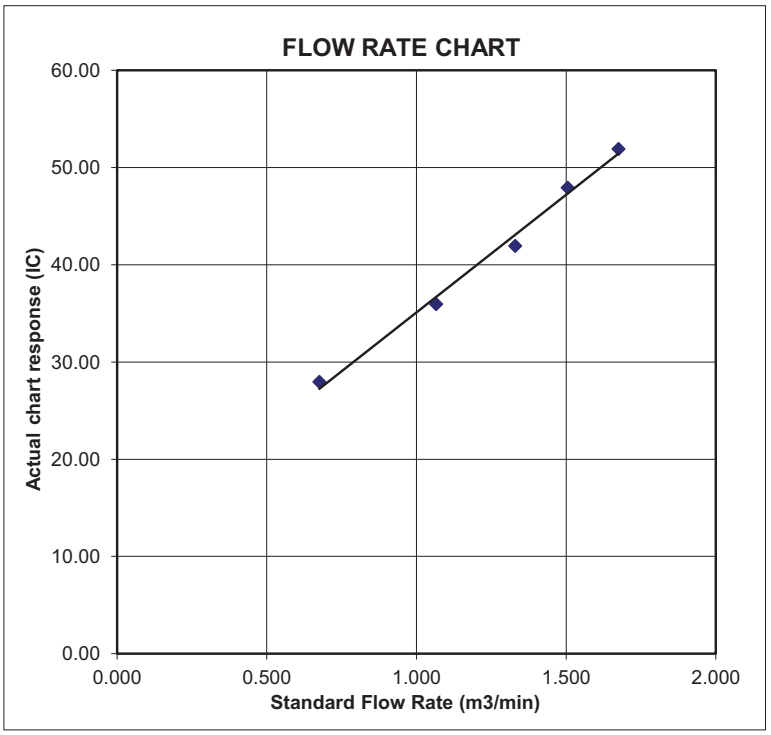
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[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.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected
18	6.2	6.2	12.4	1.681	52	52.11
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

LINEAR REGRESSION

Slope =	36.4525
Intercept =	-9.0200
Corr. coeff. =	0.9943

Calculations :

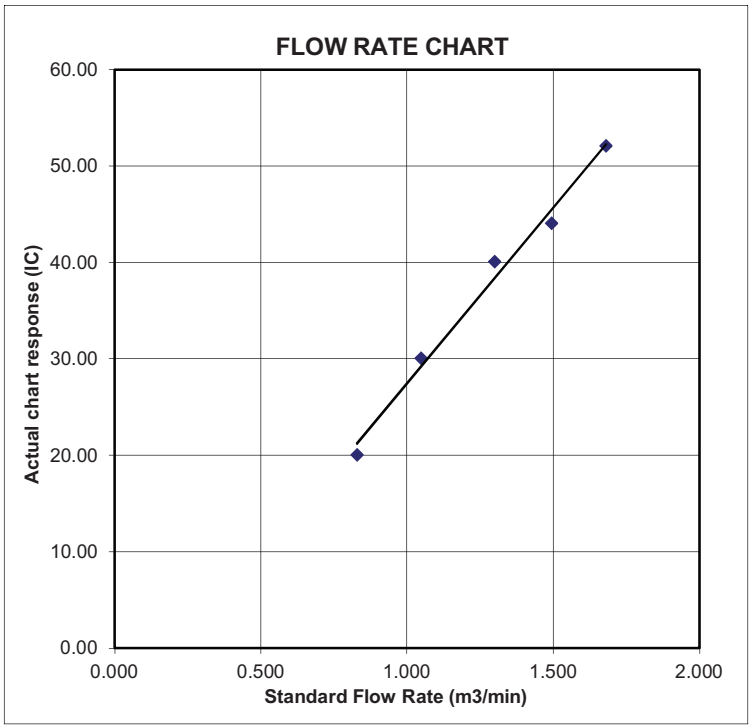
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

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



TISCH Environmental

RECALIBRATION DUE DATE:
January 19, 2022

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)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (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=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
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= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	: **HK2214745**
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	: 12-APR-2022
		DATE OF ISSUE	: 29-APR-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 : HK2214745
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.
HK2214745-001	S/N: 3Y6502	AIR	12-Apr-2022	S/N: 3Y6502

Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	3Y6502
Equipment Ref:	EQ113

Standard Equipment:

Standard Equipment:	Higher Volume Sampler (TSP)
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018 & HVS 019
Last Calibration Date:	22 February 2022

Equipment Verification Results:

Verification Date: 1 & 7 March 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-Mar-22	2hr01mins	09:17 ~ 11:18	22.5	1010.6	26.4	947	7.9
7-Mar-22	2hr01mins	11:24 ~ 13:25	22.5	1010.6	34.8	1449	12.0
7-Mar-22	2hr01mins	13:30 ~ 15:31	22.5	1010.6	40.3	1874	15.5
1-Mar-22	30mins	10:03 ~ 10:33	22	1016.9	123.1	1709	57.0
1-Mar-22	31mins	10:39 ~ 11:10	22	1016.9	93.9	1401	45.8

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

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

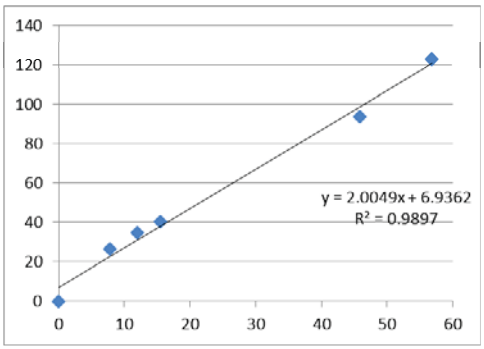
Sensitivity Adjustment Scale Setting (After Calibration) 661 (CPM)

Linear Regression of Y or X

Slope (K-factor): 2.0049 (μg/m^3)/CPM

Correlation Coefficient (R) 0.9948

Date of Issue 26 March 2022



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 2.0049 (μg/m^3)/CPM should be apply for TSP monitoring

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

Operator : Fai So Signature : Date : 26 March 2022

QC Reviewer : Ben Tam Signature : Date : 26 March 2022

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

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

CONDITIONS

Sea Level Pressure (hPa)	1010.8	Corrected Pressure (mm Hg)	758.1
Temperature (°C)	22.8	Temperature (K)	296

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	1.99838
Model->	5025A	Qstd Intercept ->	-0.00903
Calibration Date->	27-Dec-21	Expiry Date->	27-Dec-22

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION	
18	5.8	5.8	11.6	1.713	54	54.13	Slope =	27.3242
13	4.7	4.7	9.4	1.543	49	49.12	Intercept =	7.2177
10	3.6	3.6	7.2	1.351	44	44.11	Corr. coeff. =	0.9997
8	2.3	2.3	4.6	1.080	37	37.09		
5	1.4	1.4	2.8	0.844	30	30.07		

Calculations :

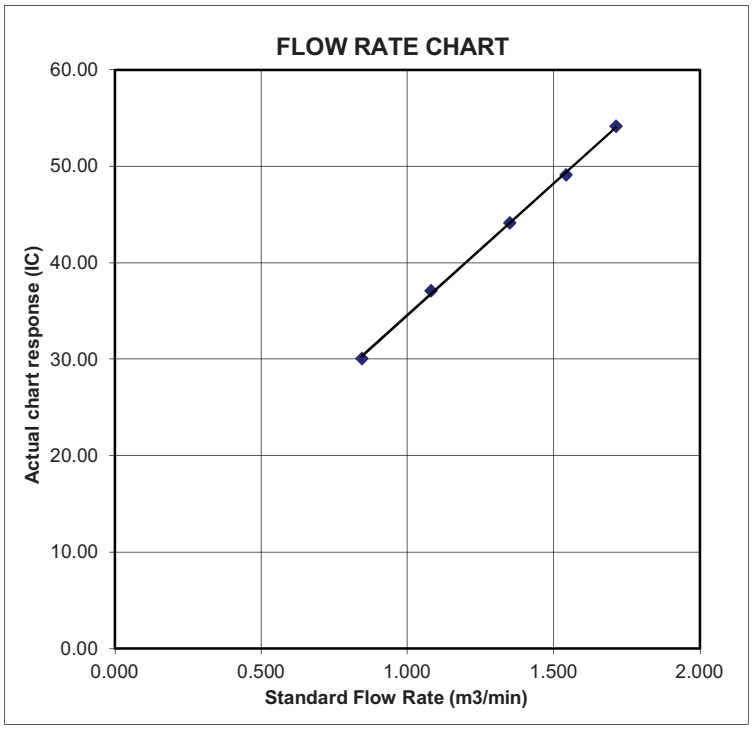
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[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:	22-Feb-22
Location ID :	Calibration Room	Next Calibration Date:	22-May-22

CONDITIONS

Sea Level Pressure (hPa)	1010.8	Corrected Pressure (mm Hg)	758.1
Temperature (°C)	22.8	Temperature (K)	296

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	1.99838
Model->	5025A	Qstd Intercept ->	-0.00903
Calibration Date->	27-Dec-21	Expiry Date->	27-Dec-22

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION	
18	6.2	6.2	12.4	1.771	52	52.13	Slope =	34.6002
13	4.9	4.9	9.8	1.575	44	44.11	Intercept =	-9.1434
10	3.8	3.8	7.6	1.387	40	40.10	Corr. coeff. =	0.9958
8	2.4	2.4	4.8	1.104	30	30.07		
5	1.5	1.5	3.0	0.873	20	20.05		

Calculations :

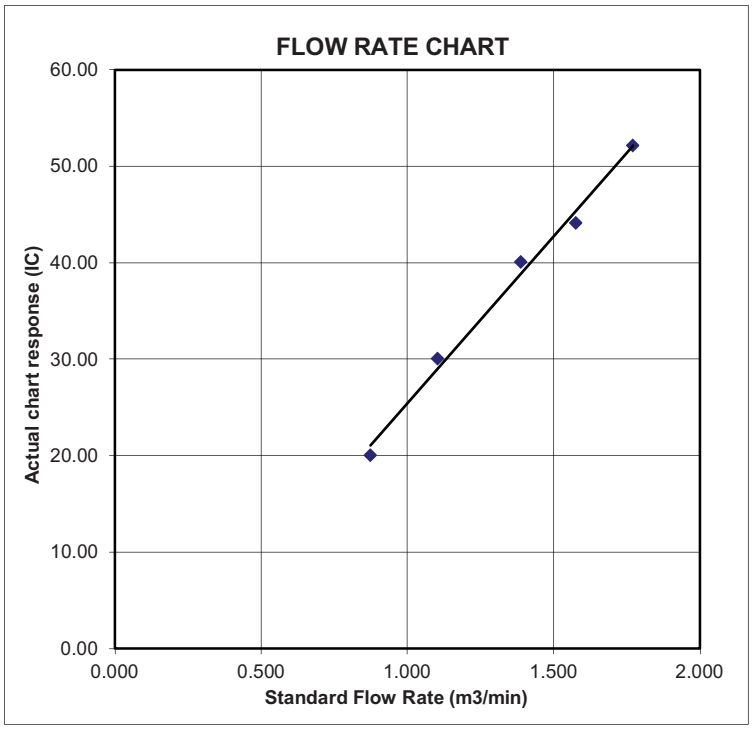
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

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



TISCH Environmental

RECALIBRATION DUE DATE:
December 27, 2022

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)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (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=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
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= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C221365
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC22-0258) Date of Receipt / 收件日期 : 14 February 2022

Description / 儀器名稱	:	Sound Level Meter (EQ018)
Manufacturer / 製造商	:	Rion
Model No. / 型號	:	NL-52
Serial No. / 編號	:	00809405
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 : 12 March 2022

TEST RESULTS / 測試結果

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

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Fluke Everett Service Center, USA
- Agilent Technologies / Keysight Technologies

Tested By : K C Lee
測試 Engineer

Certified By : H C Chan
核證 Engineer

Date of Issue : 16 March 2022
簽發日期

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

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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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. : C221365
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	C220381
CL281	Multifunction Acoustic Calibrator	AV210017

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

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

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

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Certificate No. : C221365
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6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT	IEC 61672
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.	Reading (dB)	Class 1 Spec. (dB)
30 - 130	L_A	A	Fast	94.00	63 Hz	67.8	-26.2 ± 1.5
					125 Hz	77.9	-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	95.0	+1.2 ± 1.6
					4 kHz	94.7	+1.0 ± 1.6
					8 kHz	92.9	-1.1 (+2.1 ; -3.1)
					16 kHz	85.5	-6.6 (+3.5 ; -17.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT	IEC 61672
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.	Reading (dB)	Class 1 Spec. (dB)
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	93.6	-0.2 ± 1.6
					4 kHz	92.9	-0.8 ± 1.6
					8 kHz	91.0	-3.0 (+2.1 ; -3.1)
					16 kHz	83.5	-8.5 (+3.5 ; -17.0)

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Certificate of Calibration
校正證書

Certificate No. : C221365
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 16463

- 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

Certificate of Calibration
校正證書

Certificate No. : C221363
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC22-0258) Date of Receipt / 收件日期 : 14 February 2022

Description / 儀器名稱 : Sound Level Meter (EQ067)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-31
Serial No. / 編號 : 00410221
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 : 12 March 2022

TEST RESULTS / 測試結果

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

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Fluke Everett Service Center, USA
- Agilent Technologies / Keysight Technologies

Tested By 測試 : K C Lee
Engineer

Certified By 核證 : H C Chan
Engineer

Date of Issue 簽發日期 : 16 March 2022

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

Certificate No. : C221363
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	C220381
CL281	Multifunction Acoustic Calibrator	AV210017

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT	IEC 61672 Class 1
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Spec. (dB)
30 - 120	L_A	A	Fast	94.00	1	93.8	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)
30 - 120	L_A	A	Fast	94.00	1	93.8 (Ref.)
				104.00		103.8
				114.00		113.7

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	IEC 61672 Class 1
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Spec. (dB)
30 - 120	L_A	A	Fast	94.00	1	93.8	Ref.
			Slow			93.7	± 0.3

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
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Certificate of Calibration
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Certificate No. : C221363
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT	IEC 61672 Class 1
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.	Reading (dB)	Spec. (dB)
30 - 120	L_A	A	Fast	94.00	63 Hz	67.5	-26.2 ± 1.5
					125 Hz	77.6	-16.1 ± 1.5
					250 Hz	85.1	-8.6 ± 1.4
					500 Hz	90.5	-3.2 ± 1.4
					1 kHz	93.8	Ref.
					2 kHz	95.0	+1.2 ± 1.6
					4 kHz	94.9	+1.0 ± 1.6
					8 kHz	92.7	-1.1 (+2.1 ; -3.1)
					16 kHz	87.4	-6.6 (+3.5 ; -17.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT	IEC 61672 Class 1
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.	Reading (dB)	Spec. (dB)
30 - 120	L_C	C	Fast	94.00	63 Hz	92.8	-0.8 ± 1.5
					125 Hz	93.5	-0.2 ± 1.5
					250 Hz	93.7	0.0 ± 1.4
					500 Hz	93.8	0.0 ± 1.4
					1 kHz	93.7	Ref.
					2 kHz	93.6	-0.2 ± 1.6
					4 kHz	93.1	-0.8 ± 1.6
					8 kHz	90.8	-3.0 (+2.1 ; -3.1)
					16 kHz	85.4	-8.5 (+3.5 ; -17.0)

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Certificate of Calibration
校正證書

Certificate No. : C221363
證書編號

Remarks : - UUT Microphone Model No. : UC-53A & S/N : 322551

- 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.

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Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C224779
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC22-1539) Date of Receipt / 收件日期 : 4 August 2022

Description / 儀器名稱 : Sound Level Calibrator (EQ085)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NC-73
Serial No. / 編號 : 10655561
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

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

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 20 August 2022

TEST RESULTS / 測試結果

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

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong
Assistant Engineer

Certified By 核證 : K C Lee
Engineer

Date of Issue 簽發日期 : 23 August 2022

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

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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. : C224779
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

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

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.5	± 0.2

5.2 Frequency Accuracy

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

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

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

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

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	**WORK ORDER:**	HK2228780
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:	25-Jul-2022
		DATE OF ISSUE:	29-Jul-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:	28-July-2022

GENERAL COMMENTS

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

Mr Chan Siu Ming, Vico
Manager - Inorganics

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK2228780

SUB- BATCH: 0
DATE OF ISSUE: 29-Jul-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: 28-July-2022 Date of Next Calibration: 28-October-2022

PARAMETERS:

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

Expected Reading (µS/cm)	Displayed Reading (µS/cm)	Tolerance (%)
146.9	158.0	+7.6
6667	6884	+3.3
12890	13531	+5.0
58670	58656	-0.0
	Tolerance Limit (%)	±10.0

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
2.96	2.94	-0.02
5.08	5.05	-0.03
7.51	7.51	+0.00
	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	3.95	-0.05
7.0	7.12	+0.12
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.

Mr Chan Siu Ming, Vico
Manager - Inorganics

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK2228780

SUB- BATCH: 0
DATE OF ISSUE: 29-Jul-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: 28-July-2022 Date of Next Calibration: 28-October-2022

PARAMETERS:

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

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	-0.01	--
4	4.09	+2.3
40	38.89	-2.8
80	77.59	-3.0
400	422.82	+5.7
800	755.63	-5.5
	Tolerance Limit (%)	±10.0

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

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	10.34	+3.4
20	20.65	+3.2
30	30.62	+2.1
	Tolerance Limit (%)	±10.0

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

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK2228780

SUB- BATCH: 0
DATE OF ISSUE: 29-Jul-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: 28-July-2022 Date of Next Calibration: 28-October-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)
9.0	8.4	-0.6
21.5	20.3	-1.2
38.0	37.1	-0.9
	Tolerance Limit (°C)	±2.0

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

Mr Chan Siu Ming, Vico
Manager - Inorganics

WATER

Manufacturing Certificate

This product has been tested in accordance with procedures established through Global Water Instrumentation's Quality Management System. This product meets or exceeds its manufacturing acceptance criteria.

ITEM DESCRIPTION:	Flow Probe, 5.5 - 14'
MODEL NAME/ NUMBER:	FP211
PART NUMBER:	BB1100
SERIAL NUMBER:	22B106785
ACCURACY:	± 0.1 FPS (0.03 MPS)
POWER REQUIRED:	Internal Lithium Coin Cell Battery
CABLE LENGTH:	N/A
CERTIFICATES:	CE Compliant
RANGE:	0.3 - 19.9 FPS (0.1 - 6.1 MPS)
OUTPUT:	Flow Display, FPS/MPS
CALIBRATION FACTOR:	318

Contact Global Water for all your instrumentation needs:
Water Level
Water Flow
Water Samplers
Water Quality
Weather
Remote Monitoring
Control

Technician Barnette, Melinda **Inspector** Wineberg, Josh **Date** 3/5/2022

NOTE: Global Water Instrumentation warrants that its products are free from defects in material & workmanship under normal use & service for a period of one year from date of original shipment from factory. Repaired components are warranted for a period of 90 days from shipment. Contact us for complete warranty details.

Global Water
a xylem brand

In the U.S. call toll free at 1-800-876-1172
International: 1-979-690-5560
Fax: 1-979-690-0440
Email: globalw@globalw.com

Visit our online catalog at: www.globalw.com
Our Service Address:
151 Graham Rd
College Station, TX 77845

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

This certificate is issued subject to the terms and conditions laid down by HKAS
本證書按照香港認可處訂立的條款及條件發出

L001934

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	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.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action level exceedance for two or more consecutive samples	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.	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.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	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	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.	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.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	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	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.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

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	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.	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.	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.	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	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	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.	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.	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	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, 5. 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	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.	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.	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	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	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.	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.	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 – December 2022

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

Remark: No water quality monitoring would be carried out during Christmas Holiday from 25 to 27 December 2022 as no construction activity will be carried out by The Contractors.

✓	Monitoring Day
	Sunday or Public Holiday

Impact Monitoring Schedule of Air Quality, Noise and Water Quality – January 2023

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

Remark: No water quality monitoring would be carried out during Chinese New Year from 22 to 25 January 2023 as no construction activity will be carried out by The Contractors.

✓	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	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-Hr TSP (μg/m³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m³/min)	(std m³)	INITIAL	FINAL	(g)	
2-Dec-22	28919	26374.71	26398.71	1440.00	42	42	42.0	16.5	1019.4	1.13	1624	2.6814	2.7907	0.1093	67
8-Dec-22	28950	26398.71	26422.71	1440.00	43	43	43.0	19.9	1017.9	1.15	1654	2.7580	2.8286	0.0706	43
14-Dec-22	29012	26422.71	26446.71	1440.00	43	43	43.0	12.5	1021.4	1.17	1680	2.7222	2.7994	0.0772	46
20-Dec-22	29022	26446.71	26470.71	1440.00	43	43	43.0	16.8	1018.3	1.16	1666	2.7472	2.8587	0.1115	67
23-Dec-22	29042	26470.71	26494.71	1440.00	42	42	42.0	17.1	1019	1.13	1624	2.7362	2.8813	0.1451	89
29-Dec-22	29053	26494.71	26518.71	1440.00	42	42	42.0	16.8	1024.2	1.13	1630	2.7404	2.9075	0.1671	103

24-Hour TSP Monitoring Data for ASR-2

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-Hr TSP (μg/m³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m³/min)	(std m³)	INITIAL	FINAL	(g)	
2-Dec-22	28920	23813.36	23837.36	1440.00	43	43	43.0	16.5	1019.4	1.24	1793	2.6853	2.8120	0.1267	71
8-Dec-22	28949	23837.36	23861.37	1440.60	42	42	42.0	19.9	1017.9	1.21	1737	2.7579	2.9145	0.1566	90
14-Dec-22	29013	23861.36	23885.36	1440.00	42	42	42.0	12.5	1021.4	1.22	1763	2.7224	2.7699	0.0475	27
20-Dec-22	29023	23885.36	23909.36	1440.00	42	42	42.0	16.8	1018.3	1.21	1745	2.7404	2.9280	0.1876	107
23-Dec-22	29043	23909.36	23933.36	1440.00	43	43	43.0	17.1	1019	1.24	1790	2.7223	2.9422	0.2199	123
29-Dec-22	29052	23933.36	23957.36	1440.00	41	41	41.0	16.8	1024.2	1.18	1706	2.7367	3.0114	0.2747	161

24-Hour TSP Monitoring Data for ASR-3a

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-Hr TSP (μg/m³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m³/min)	(std m³)	INITIAL	FINAL	(g)	
2-Dec-22	28921	17581.11	17605.11	1440.00	39	39	39	16.5	1019.4	1.18	1699	2.6774	2.7105	0.0331	19
8-Dec-22	28948	17605.11	17629.11	1440.00	39	39	39	19.9	1017.9	1.17	1688	2.7501	2.8184	0.0683	40
14-Dec-22	29014	17629.11	17653.11	1440.00	39	39	39	12.5	1021.4	1.19	1712	2.7194	2.7969	0.0775	45
20-Dec-22	29021	17653.11	17677.11	1440.00	40	40	40	16.8	1018.3	1.21	1742	2.7419	2.7684	0.0265	15
23-Dec-22	29041	17677.11	17701.11	1440.00	39	39	39	17.1	1019	1.18	1698	2.7324	2.8060	0.0736	43
29-Dec-22	29051	17701.11	17725.11	1440.00	39	39	39	16.8	1024.2	1.18	1703	2.7422	2.8056	0.0634	37

Noise

Noise Measurement Results (dB(A)) of CN-1

Date	Start Time	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3rd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq_{30min}	Façade Correction (*)
9-Dec-22	9:14	71.8	55.2	52.9	53.7	55.1	52.6	53.8	54.9	52.8	54.1	55.6	52.9	53.5	54	52.9	55.7	57.9	52.8	64	67
15-Dec-22	13:00	65.5	56.7	53.3	63.7	56.2	53.5	59.7	55.6	53.6	57.8	57.9	52.9	57.3	56.9	53	56.2	57.7	52.7	61	64
21-Dec-22	9:30	62.6	65.2	58.1	61.2	62.7	57.4	62.6	65.7	56	63.3	64.7	54.4	58.9	63.1	51.1	58.8	62.9	50.7	62	65
30-Dec-22	9:15	62.3	62.3	59.1	64.3	63.9	60.1	62.8	63.7	60.7	62	62.4	58.9	64.4	63.5	60.9	63	62.6	59.5	63	66

(*) 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	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3rd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq_{30min}	Façade Correction (*)
9-Dec-22	9:47	65.4	62.6	52.7	60.2	63.9	51.3	60.5	64.3	53.1	56.6	61	50.7	64.5	63	50.3	60.1	64.6	50.7	62	65
15-Dec-22	13:33	69.7	64.8	57.2	62.8	64.3	56.7	60.9	64.7	55.2	59	62.7	53.2	59.2	61	53.3	62.7	64.7	53	64	67
21-Dec-22	10:03	66.2	69.3	58.9	64.3	66.7	57.9	65.1	67.2	58.2	64.9	69	57.7	67.6	68.5	57.4	62.2	63.7	56.9	65	68
30-Dec-22	9:55	67.9	69.5	62.5	65.2	67	62	66	67.5	62.5	68.1	69	62.5	65.3	67	61	66.9	68.5	64	67	70

(*) 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	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3rd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq_{30min}	Façade Correction (*)
9-Dec-22	10:20	54.0	57.7	47.8	52.6	57.4	46.1	53.9	57.7	45.7	50.8	54.4	45.6	52.9	56.1	46.8	53.2	57.0	47.6	53	56
15-Dec-22	14:07	55.5	57.8	48.8	54.2	57.2	47.2	53.9	56.2	46.9	54.7	57.0	46.2	53.7	57.2	46.1	54.3	57.6	47.2	54	57
21-Dec-22	10:35	60.2	53.2	49.7	57.4	52.3	49.5	53.6	52.0	48.9	53.2	51.7	49.2	52.8	51.3	49.0	59.8	52.0	49.6	57	60
30-Dec-22	10:38	55.1	58.3	52.1	54.8	56.3	51.4	65.3	66.4	63.4	63.1	66.3	51.1	59.3	65.3	52.1	64.2	65.4	54.6	62	65

(*) 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	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3rd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq_{30min}
9-Dec-22	10:55	63.6	65.6	62	64.9	67.3	62	63.1	63.9	62	63.7	65.7	62	63.9	64.2	62	63.4	65.1	61.6	64
15-Dec-22	14:41	61.2	63.4	61.1	66.6	67.5	62.2	62.1	62.4	62.1	61	63.4	62	63.1	66.2	62.5	63.7	65.9	62.1	63
21-Dec-22	11:09	65.5	69.2	57.8	63.3	66.8	57.5	65	67.2	58.2	63.8	69	57.7	67.2	68.8	57.5	62.2	63	56.6	65
30-Dec-22	11:16	58.5	61.2	45.5	57.8	59.7	45.7	59.4	60.8	45.9	57.9	60.4	44.8	59.6	61.5	46.2	57	59.9	45.8	58

Water Quality

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Water Quality Impact Monitoring Result for M1

Date	2-Dec-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	15.5	15.5	<0.1	<0.1	8.4	8.45	92.4	92.7	4.1	4.2	7.08	7.1	0.04	0.04	6	5.5
			15.5		<0.1		8.49		92.9		4.2		7.08		0.04		5	

Date	5-Dec-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	15.3	15.3	<0.1	<0.1	7.93	7.92	85.9	85.8	7	7.1	7.26	7.3	0.04	0.04	7	7.0
			15.3		<0.1		7.9		85.6		7.1		7.26		0.04		7	

Date	7-Dec-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	14.8	14.8	<0.1	<0.1	8.06	8.06	87.6	87.5	5.69	5.7	7.02	7.0	0.05	0.05	8	8.0
			14.8		<0.1		8.05		87.4		5.72		7.02		0.05		8	

Date	9-Dec-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	16.7	16.7	<0.1	<0.1	7.99	7.95	89.6	89.2	1.03	1.0	7.29	7.3	0.08	0.08	2	2.5
			16.7		<0.1		7.91		88.7		1.02		7.29		0.08		3	

Date	12-Dec-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	16.2	16.2	<0.1	<0.1	7.98	7.98	89.1	89.1	4.2	4.2	7.62	7.6	0.04	0.04	6	6.5
			16.2		<0.1		7.97		89.0		4.1		7.62		0.04		7	

Date	14-Dec-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	14.3	14.3	<0.1	<0.1	8.4	8.38	88.7	88.5	3.32	3.3	7.03	7.0	0.05	0.05	8	8.0
			14.3		<0.1		8.35		88.3		3.27		7.03		0.05		8	

Date	16-Dec-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	14.7	14.7	<0.1	<0.1	8.66	8.66	90.9	90.9	2.23	2.2	7.61	7.6	0.05	0.05	8	7.5
			14.7		<0.1		8.65		90.9		2.1		7.61		0.05		7	

Date	19-Dec-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	13.5	13.5	<0.1	<0.1	8.59	8.58	90.2	90.1	4.59	4.6	7.57	7.6	0.05	0.05	4	4.5
			13.5		<0.1		8.57		90.0		4.6		7.57		0.05		5	

Date	21-Dec-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	14.3	14.3	<0.1	<0.1	8.5	8.49	91.5	91.4	3.01	3.0	7.30	7.3	0.05	0.05	8	8.0
			14.3		<0.1		8.48		91.2		2.99		7.30		0.05		8	

Date	23-Dec-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M1	10:30	0.14	14.7	14.7	<0.1	<0.1	8.27	8.25	91.0	90.8	5.42	5.4	7.54	7.5	0.07	0.07	7	6.5
			14.7		<0.1		8.22		90.5		5.33		7.54		0.07		6	

Date	28-Dec-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M1	13:00	0.14	14.5	14.5	<0.1	<0.1	9.29	9.29	90.9	90.9	7.04	7.1	7.60	7.6	0.07	0.07	7	7.0
			14.5		<0.1		9.28		90.8		7.1		7.60		0.07		7	

Date	30-Dec-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	14.1	14.1	<0.1	<0.1	8.19	8.18	86.2	86.1	6.3	6.1	7.20	7.2	0.07	0.07	6	6.5
			14.1		<0.1		8.16		85.9		5.9		7.20		0.07		7	

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Water Quality Impact Monitoring Result for M2

Date	2-Dec-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	0.00			<0.1	<0.1												
					<0.1													

Date	5-Dec-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	15.1	15.1	<0.1	<0.1	6.24	6.22	67.7	67.4	24.1	24.7	7.01	7.0	0.07	0.07	25	25.5
			15.1		<0.1		6.19		67.1		25.2		7.01		0.07		26	

Date	7-Dec-22																			
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	10:40	0.08	15.2	15.2	<0.1	<0.1	5.35	5.35	57.0	57.1	22.1	22.4	7.40	7.4	0.07	0.07	26	27.0
			15.2		<0.1		5.34		57.1		22.6		7.40		0.07		28	

Date	9-Dec-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	17.8	17.8	<0.1	<0.1	8.53	8.52	94.9	94.9	2.91	3.0	7.07	7.1	0.08	0.08	<2	<2
			17.8		<0.1		8.51		94.8		3.12		7.07		0.08		<2	

Date	12-Dec-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	0.07	17.2	17.2	<0.1	<0.1	8.36	8.34	91.2	91.0	1.56	1.6	7.62	7.6	0.08	0.08	<2	<2
			17.2		<0.1		8.31		90.7		1.57		7.62		0.08		<2	

Date	14-Dec-22																			
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	10:20	0.07	14.1	14.1	<0.1	<0.1	5.33	5.34	54.9	55.0	4.62	4.6	7.20	7.2	0.08	0.08	4	4.0
			14.1		<0.1		5.34		55.0		4.65		7.20		0.08		4	

Date	16-Dec-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	15.1	15.1	<0.1	<0.1	8.71	8.70	92.4	92.3	1.1	1.1	7.52	7.5	0.08	0.08	<2	<2
			15.1		<0.1		8.68		92.1		1		7.52		0.08		<2	

Date	19-Dec-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	14.1	14.1	<0.1	<0.1	8.66	8.64	91.7	91.5	4.31	4.2	7.41	7.4	0.08	0.08	4	3.5
			14.1		<0.1		8.62		91.2		4.02		7.41		0.08		3	

Date	21-Dec-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	14.1	14.1	<0.1	<0.1	5.86	5.83	63.5	63.2	5.56	5.5	7.15	7.2	0.08	0.08	7	7.5
			14.1		<0.1		5.79		62.8		5.42		7.15		0.08		8	

Date	23-Dec-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	11:15	0.08	15.5	15.5	<0.1	<0.1	8.44	8.43	92.3	92.2	2.8	2.8	7.54	7.5	0.08	0.08	2	2.0
			15.5		<0.1		8.42		92.0		2.84		7.54		0.08		2	

Date	28-Dec-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	11:40	0.08	14.7	14.7	<0.1	<0.1	8.45	8.44	92.7	92.6	1.62	1.6	7.30	7.3	0.08	0.08	6	6.0
			14.7		<0.1		8.43		92.4		1.61		7.30		0.08		6	

Date	30-Dec-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M2	10:40	0.07	14.7	14.7	<0.1	<0.1	8.48	8.47	88.3	88.2	5.04	5.1	7.01	7.0	0.07	0.07	5	5.5
			14.7		<0.1		8.46		88.1		5.06		7.01		0.07		6	

AUES

Water Quality Impact Monitoring Result for M3

Date	2-Dec-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	16.1	16.1	<0.1	<0.1	7.56	7.56	83.5	83.4	2.84	2.8	7.02	7.0	0.01	0.01	5	5.0
			16.1		<0.1		7.55		83.3		2.79		7.02				5	

Date	5-Dec-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	15.7	15.7	<0.1	<0.1	7.97	7.96	86.2	86.1	3.6	3.4	6.95	7.0	0.01	0.01	6	5.5
			15.7		<0.1		7.95		86.0		3.1		6.95		0.01		5	

Date	7-Dec-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	10:50	2.45	15.9	15.9	<0.1	<0.1	7.89	7.89	85.5	85.4	2.56	2.6	7.10	7.1	0.01	0.01	7	6.0
			15.9		<0.1		7.88		85.3		2.54		7.10		0.01		5	

Date	9-Dec-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	18	18.0	<0.1	<0.1	7.61	7.58	85.6	85.3	2.08	2.1	7.04	7.0	0.01	0.01	3	3.0
			18		<0.1		7.55		84.9		2.05		7.04		0.01		3	

Date	12-Dec-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	16.8	16.8	<0.1	<0.1	8.01	8.00	88.1	87.9	1.98	2.0	7.77	7.8	0.01	0.01	3	2.5
			16.8		<0.1		7.99		87.6		1.97		7.77		0.01		2	

Date	14-Dec-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	10:30	2.45	14.4	14.4	<0.1	<0.1	8.24	8.24	86.6	86.5	3.72	3.8	7.25	7.2	0.01	0.01	3	2.5
			14.4		<0.1		8.23		86.4		3.84		7.22		0.01		2	

Date	16-Dec-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	14.9	14.9	<0.1	<0.1	8.48	8.48	89.1	89.1	1.26	1.3	7.66	7.7	0.01	0.01	3	3.5
			14.9		<0.1		8.47		89.0		1.28		7.66		0.01		4	

Date	19-Dec-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	14.3	14.3	<0.1	<0.1	8.53	8.52	89.8	89.7	2.41	2.4	7.58	7.6	0.01	0.01	3	2.5
			14.3		<0.1		8.51		89.6		2.32		7.58		0.01		2	

Date	21-Dec-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	2.43	16	16.0	<0.1	<0.1	8.35	8.34	89.8	89.7	2.88	2.9	7.11	7.1	0.01	0.01	3	3.0
			16		<0.1		8.33		89.5		2.92		7.11		0.01		3	

Date	23-Dec-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	11:25	2.40	15.3	15.3	<0.1	<0.1	8.05	8.03	88.8	88.6	1.26	1.3	7.46	7.5	0.01	0.01	5	4.5
			15.3		<0.1		8.01		88.3		1.33		7.46		0.01		4	

Date	28-Dec-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	11:50	2.43	14.6	14.6	<0.1	<0.1	8.13	8.12	88.8	88.6	2.29	2.3	7.80	7.8	0.04	0.04	7	6.5
			14.6		<0.1		8.1		88.4		2.26		7.80		0.04		6	

Date	30-Dec-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M3	10:50	2.43	14.5	14.5	<0.1	<0.1	8.32	8.30	87.2	87.0	3.5	3.2	7.11	7.1	0.01	0.01	5	6.5
			14.5		<0.1		8.28		86.7		2.89		7.11		0.01		8	

AUES

Water Quality Impact Monitoring Result for M4

Date	2-Dec-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	0.13	16.3	16.3	<0.1	<0.1	8.01	7.99	87.7	87.5	1.8	1.8	7.05	7.1	0.08	0.08	2	2.0
			16.3		<0.1		7.97		87.2		1.8		7.11		0.08		2	

Date	5-Dec-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	0.43	16	16.0	<0.1	<0.1	8.09	8.07	87.2	86.9	3.2	3.2	7.15	7.2	0.08	0.08	5	4.5
			16		<0.1		8.04		86.6		3.1		7.15		0.08		4	

Date	7-Dec-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	11:05	0.41	16.1	16.1	<0.1	<0.1	8.38	8.37	90.1	90.0	1.6	1.6	7.20	7.2	0.08	0.08	4	3.5
			16.1		<0.1		8.35		89.9		1.5		7.20		0.08		3	

Date	9-Dec-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	0.42	18.1	18.1	<0.1	<0.1	8.19	8.18	91.4	91.3	1.4	1.4	7.07	7.1	0.08	0.08	<2	<2
			18.1		<0.1		8.16		91.1		1.4		7.07		0.08		<2	

Date	12-Dec-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	0.44	16.6	16.6	<0.1	<0.1	8.39	8.38	91.4	91.3	2.0	1.9	7.44	7.4	0.09	0.09	3	2.5
			16.6		<0.1		8.37		91.2		1.9		7.44		0.09		2	

Date	14-Dec-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	10:45	0.44	14.3	14.3	<0.1	<0.1	8.58	8.57	90.2	90.1	4.8	4.8	7.05	7.1	0.06	0.06	<2	<2
			14.3		<0.1		8.56		89.9		4.8		7.05		0.06		<2	

Date	16-Dec-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	0.41	14.8	14.8	<0.1	<0.1	8.8	8.79	92.5	92.5	1.1	1.1	7.55	7.6	0.09	0.09	3	2.5
			14.8		<0.1		8.78		92.4		1.1		7.55		0.09		2	

Date	19-Dec-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	0.43	14.5	14.5	<0.1	<0.1	8.72	8.72	91.5	91.5	1.1	1.0	7.56	7.6	0.05	0.05	<2	<2
			14.5		<0.1		8.71		91.4		1.0		7.56		0.05		<2	

Date	21-Dec-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	0.42	16.2	16.2	<0.1	<0.1	8.69	8.69	93.4	93.4	2.3	2.2	7.12	7.1	0.08	0.08	3	3.0
			16.2		<0.1		8.68		93.3		2.2		7.12		0.08		3	

Date	23-Dec-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	11:40	0.40	15.6	15.6	<0.1	<0.1	8.46	8.46	93.6	93.6	1.6	1.6	7.39	7.4	0.08	0.08	3	3.0
			15.6		<0.1		8.45		93.5		1.6		7.39		0.08		3	

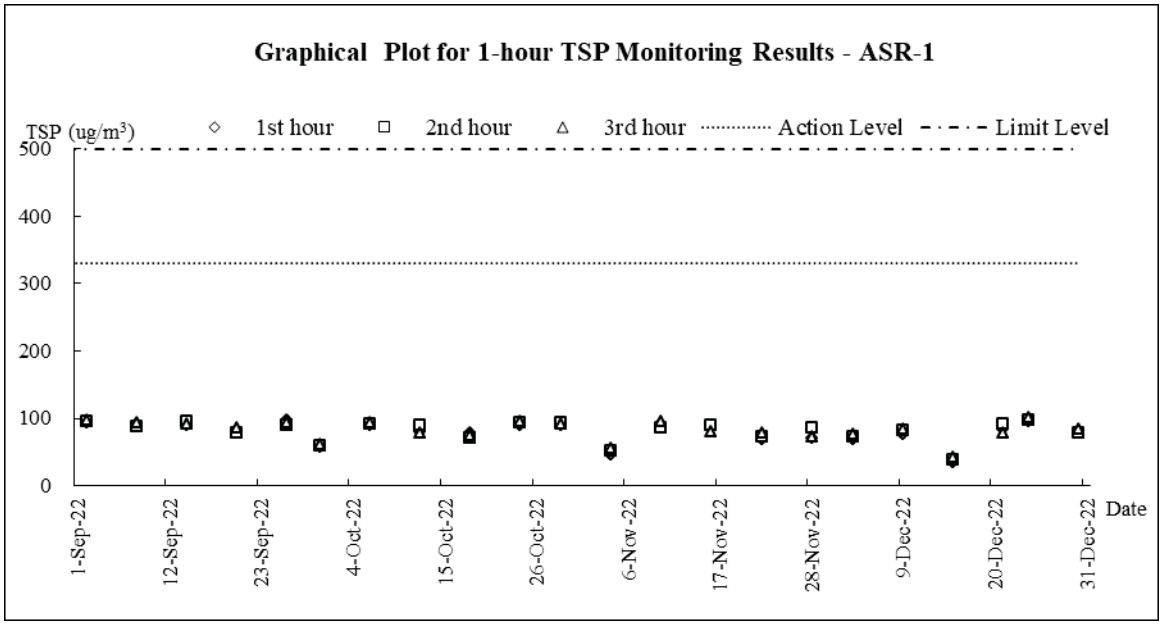
Date	28-Dec-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	13:20	0.42	16.1	16.1	<0.1	<0.1	8.44	8.44	93.3	93.3	5.0	5.0	7.99	8.0	0.08	0.08	5	4.5
			16.1		<0.1		8.43		93.2		5.0		7.99		0.08		4	

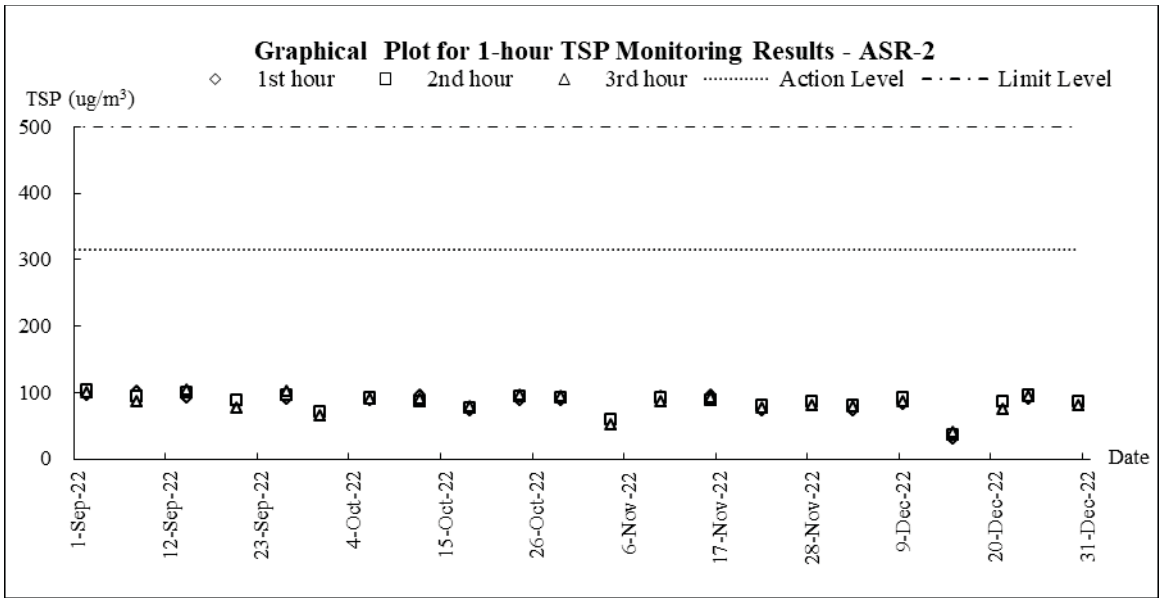
Date	30-Dec-22																	
Location	Time	Depth (m)	Temp (oC)		Flow Velocity (m/s)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		Salinity		SS(mg/L)	
M4	11:10	0.41	14.3	14.3	<0.1	<0.1	8.73	8.70	91.1	90.9	3.1	3.1	7.04	7.0	0.05	0.05	4	4.0
			14.3		<0.1		8.67		90.6		3.1		7.04		0.05		4	

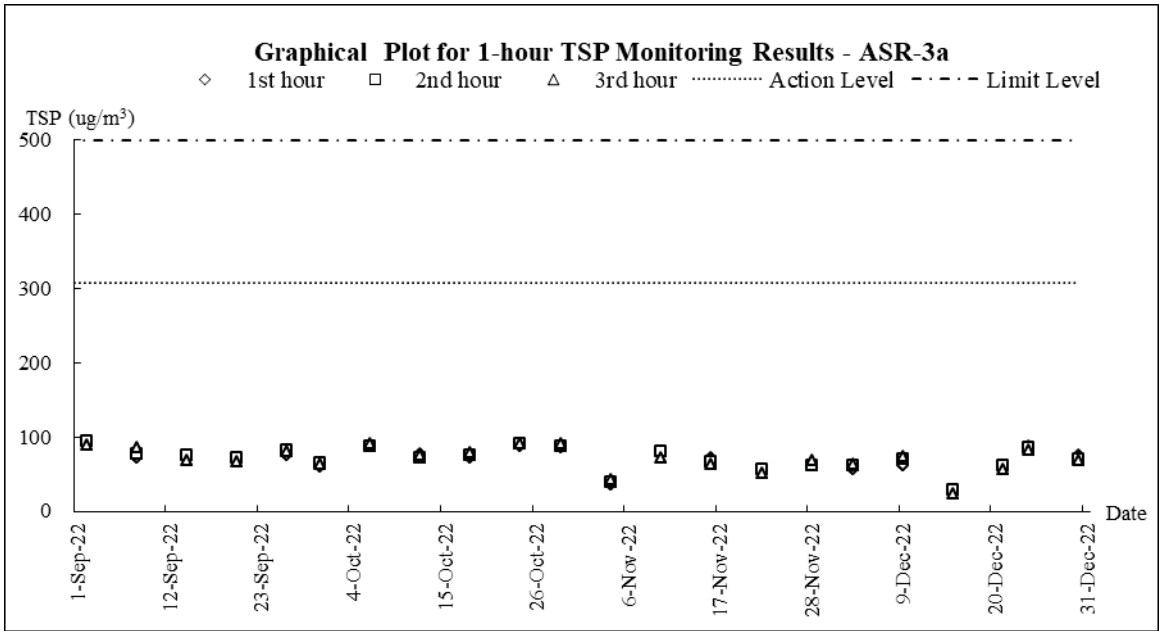
Appendix I

Graphical Plots of Air Quality, Noise and Water Quality

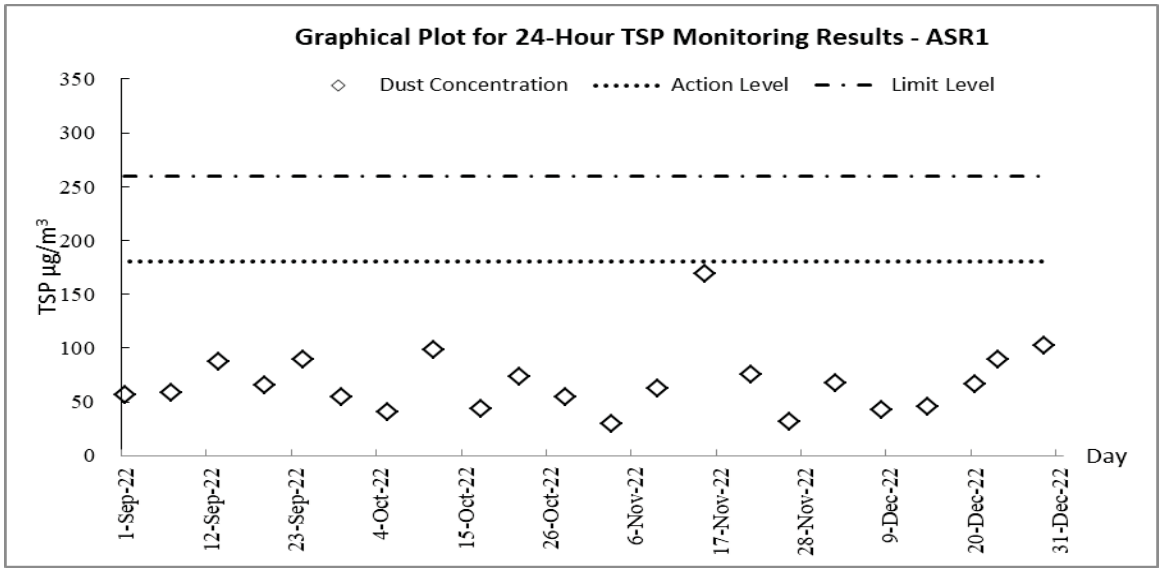
Air Quality Impact Monitoring – 1-hour TSP

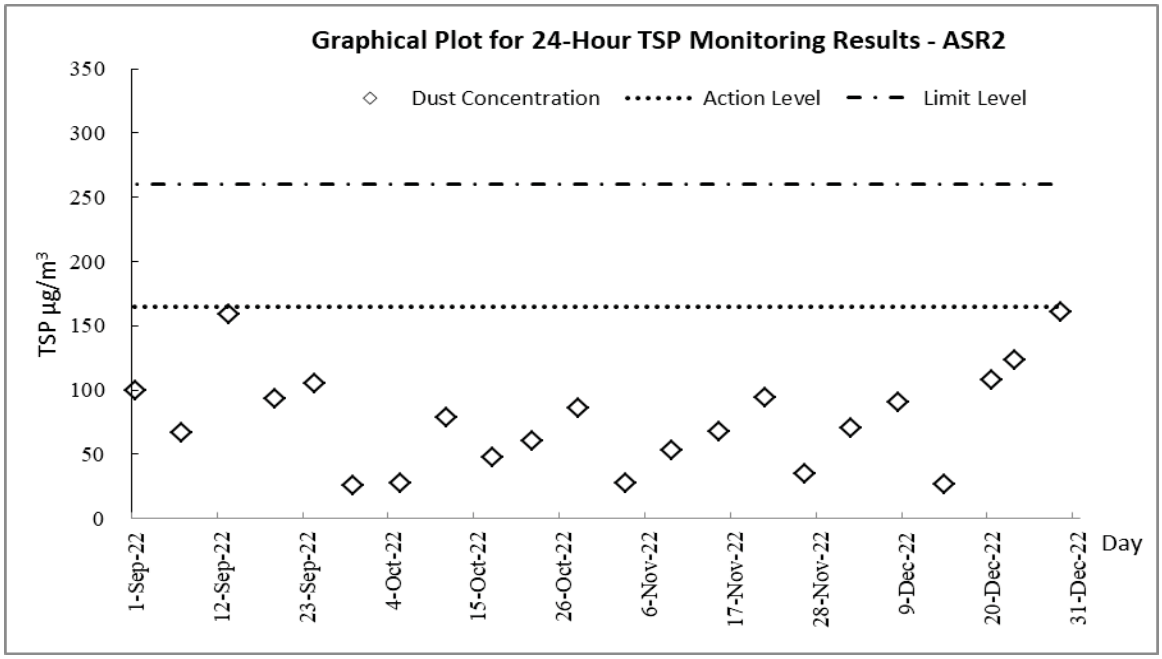


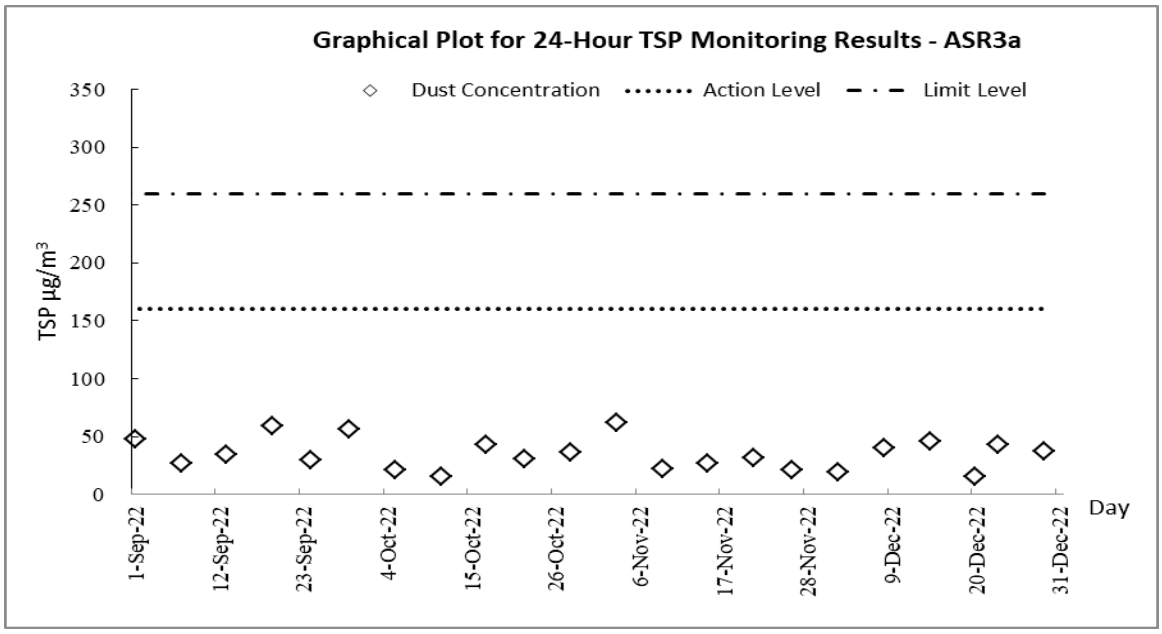




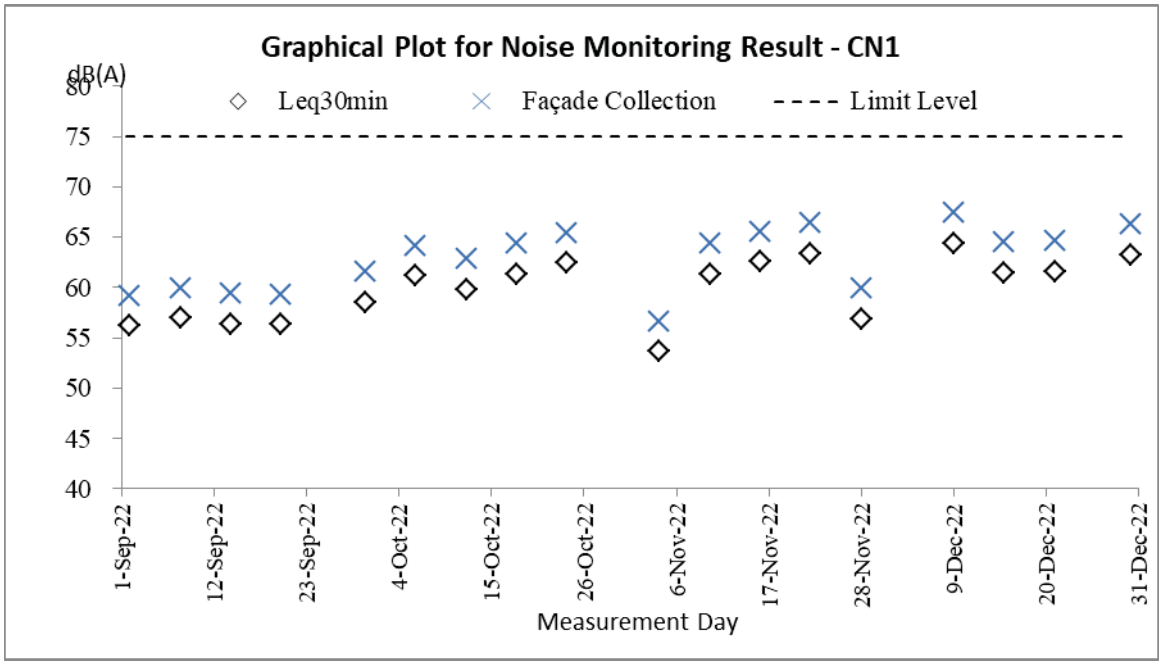
Air Quality Impact Monitoring – 24-hour TSP

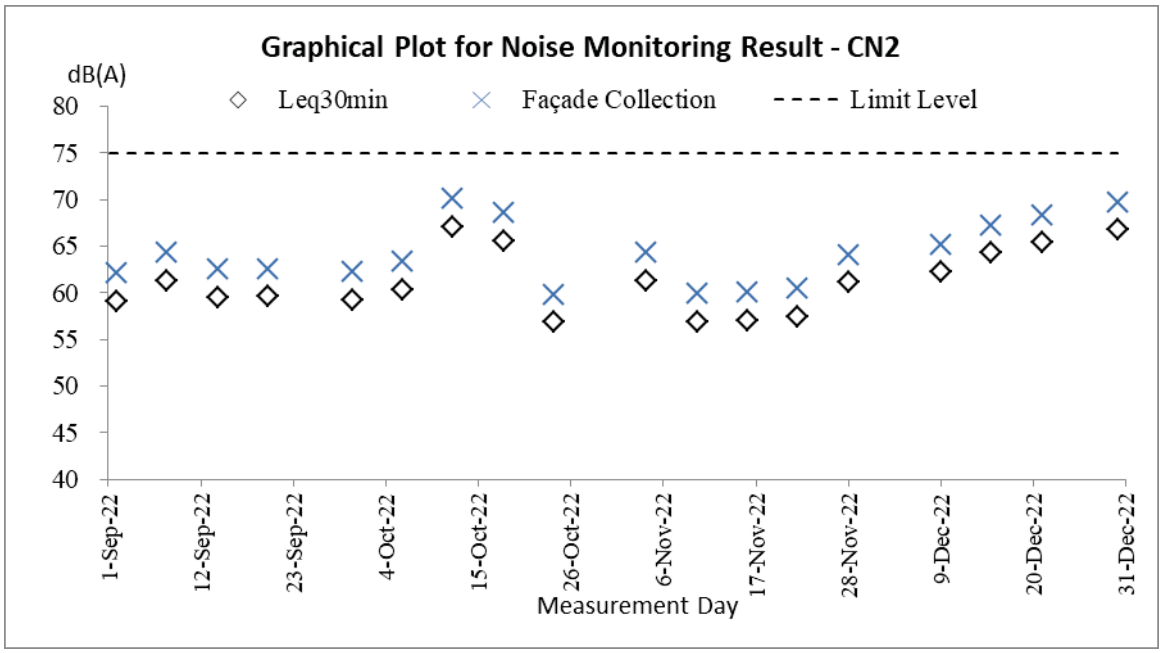


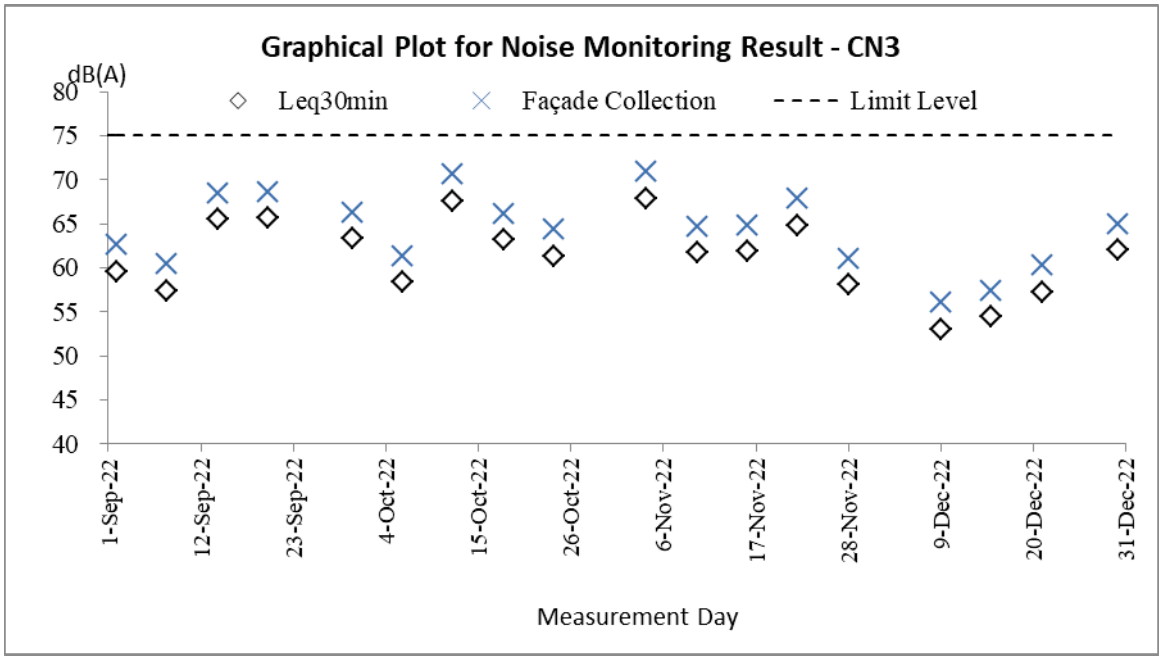


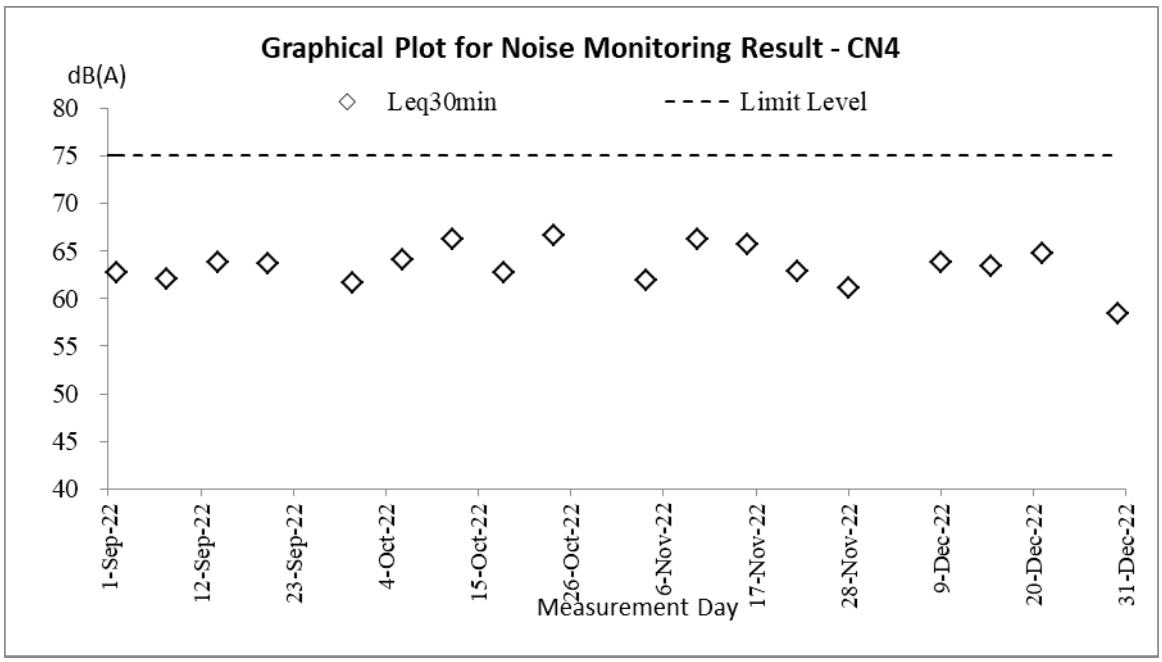


Construction Noise Impact Monitoring

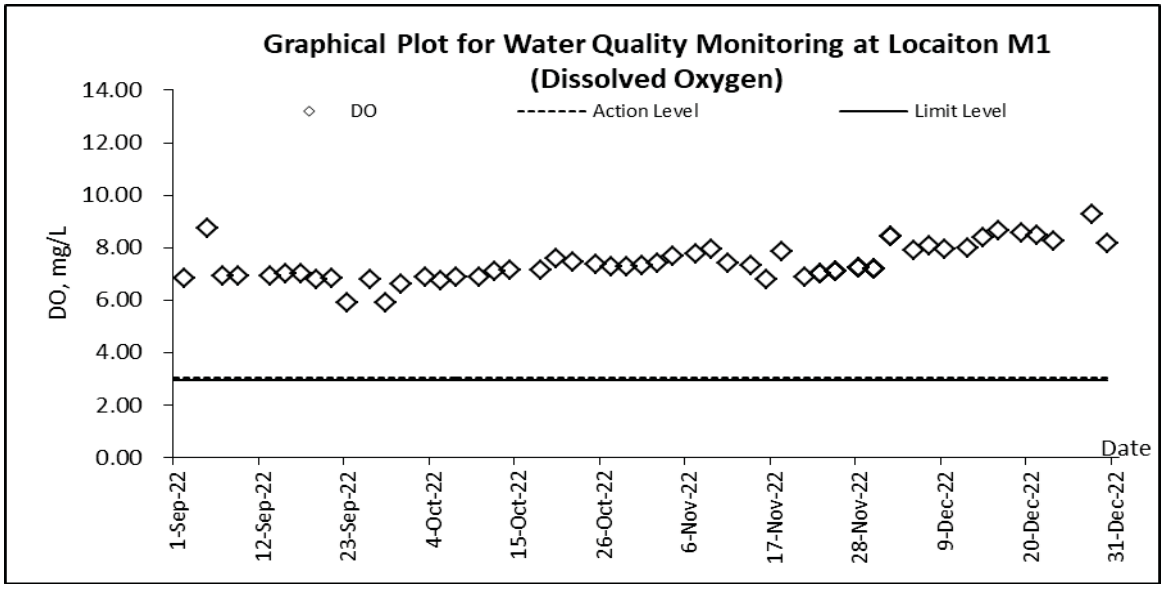


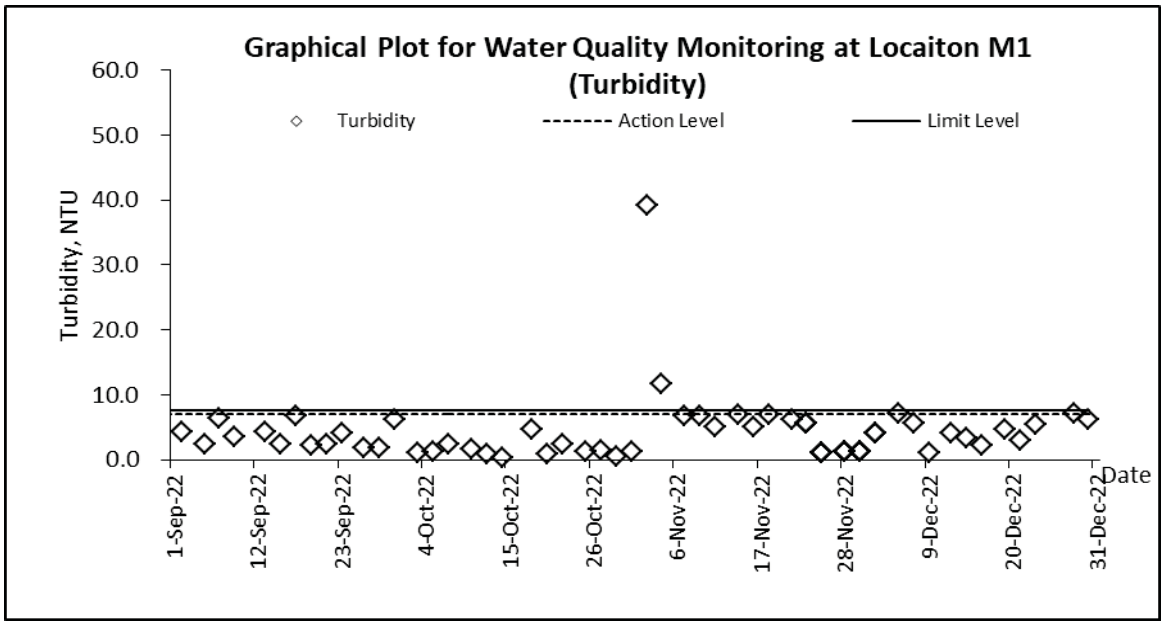


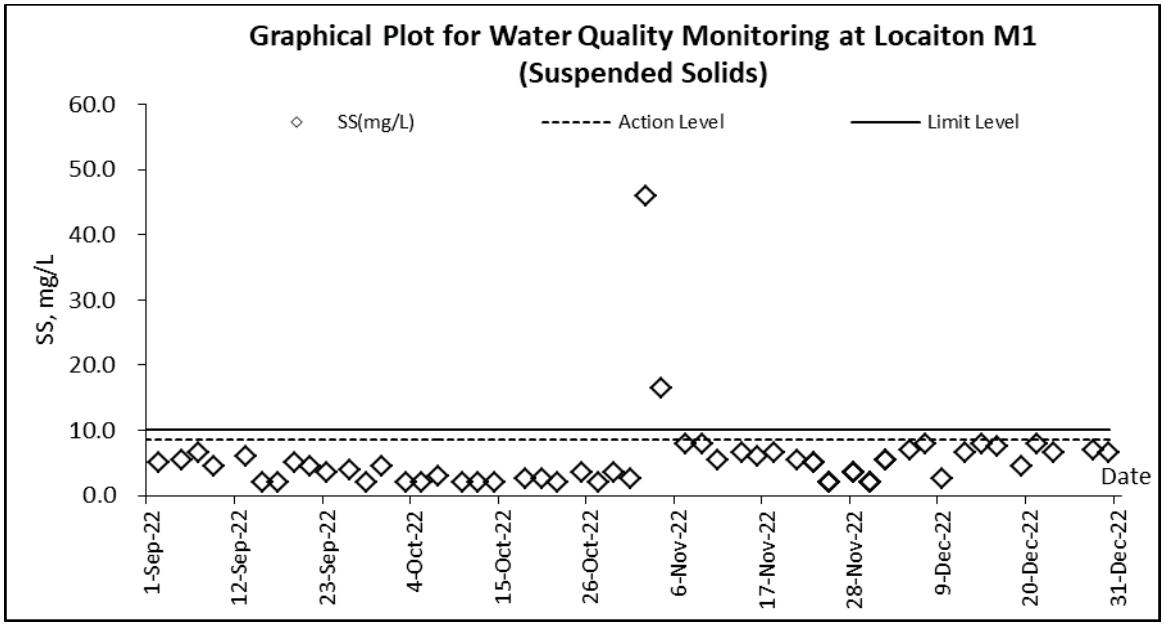

Graphical Plot for Noise Monitoring Result - CN3
dB(A)
Leq30min
Façade Collection
Limit Level
80
75
70
65
60
55
50
45
40
1-Sep-22
12-Sep-22
23-Sep-22
4-Oct-22
15-Oct-22
26-Oct-22
6-Nov-22
17-Nov-22
28-Nov-22
9-Dec-22
20-Dec-22
31-Dec-22
Measurement Day

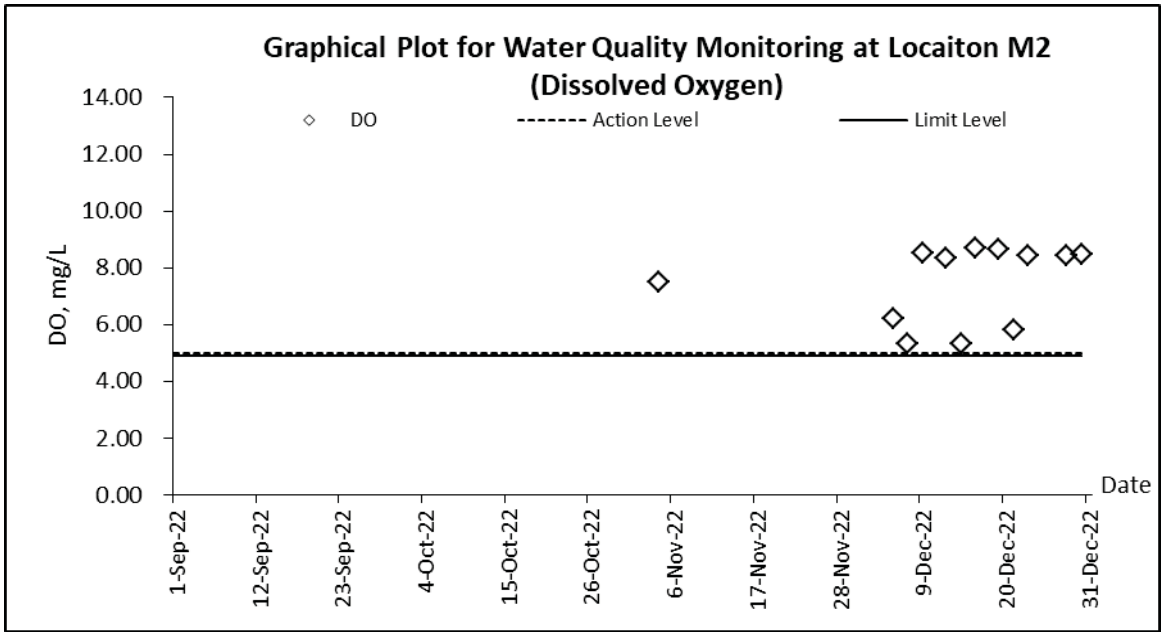

Graphical Plot for Noise Monitoring Result - CN4
dB(A)
Leq30min
Limit Level
80
75
70
65
60
55
50
45
40
1-Sep-22
12-Sep-22
23-Sep-22
4-Oct-22
15-Oct-22
26-Oct-22
6-Nov-22
17-Nov-22
28-Nov-22
9-Dec-22
20-Dec-22
31-Dec-22
Measurement Day

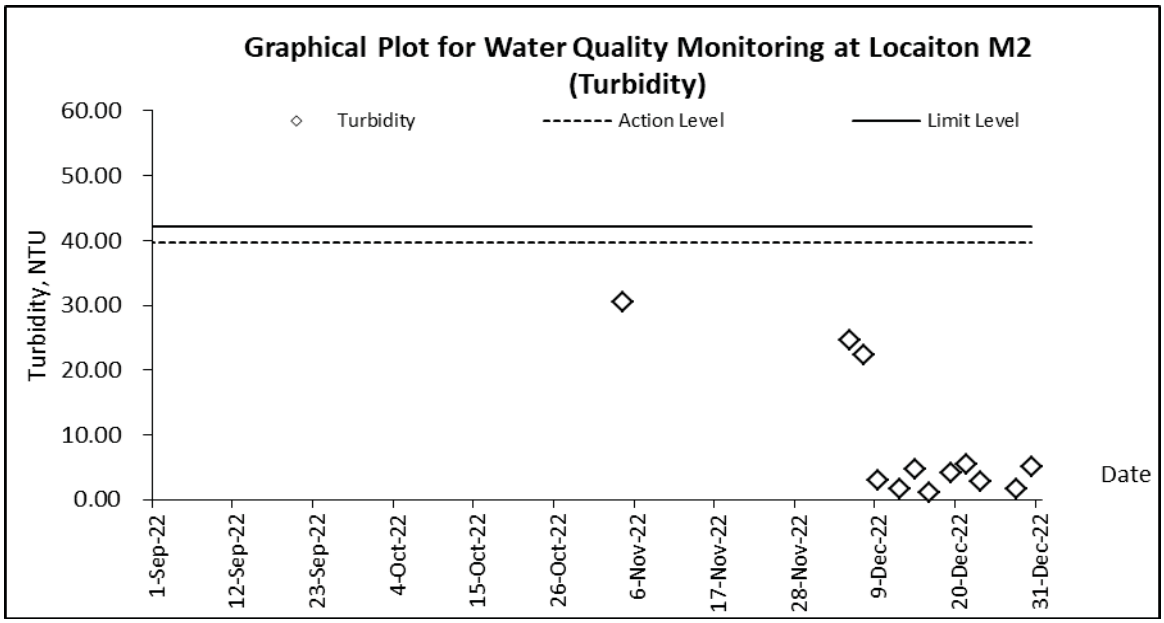
Water Quality Impact Monitoring

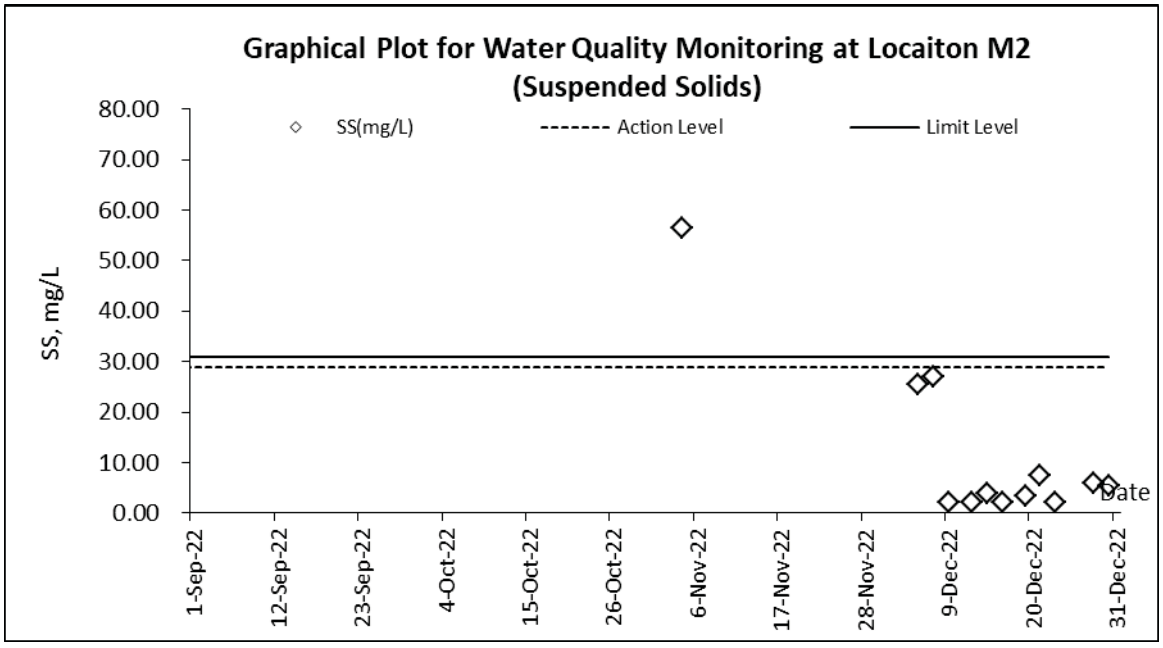


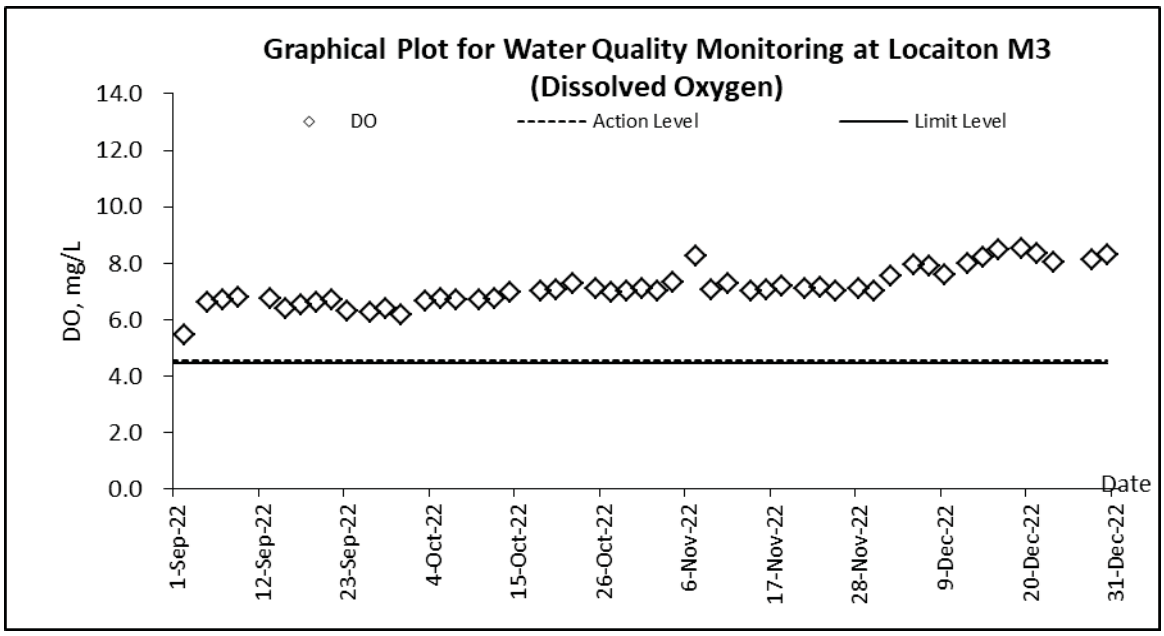


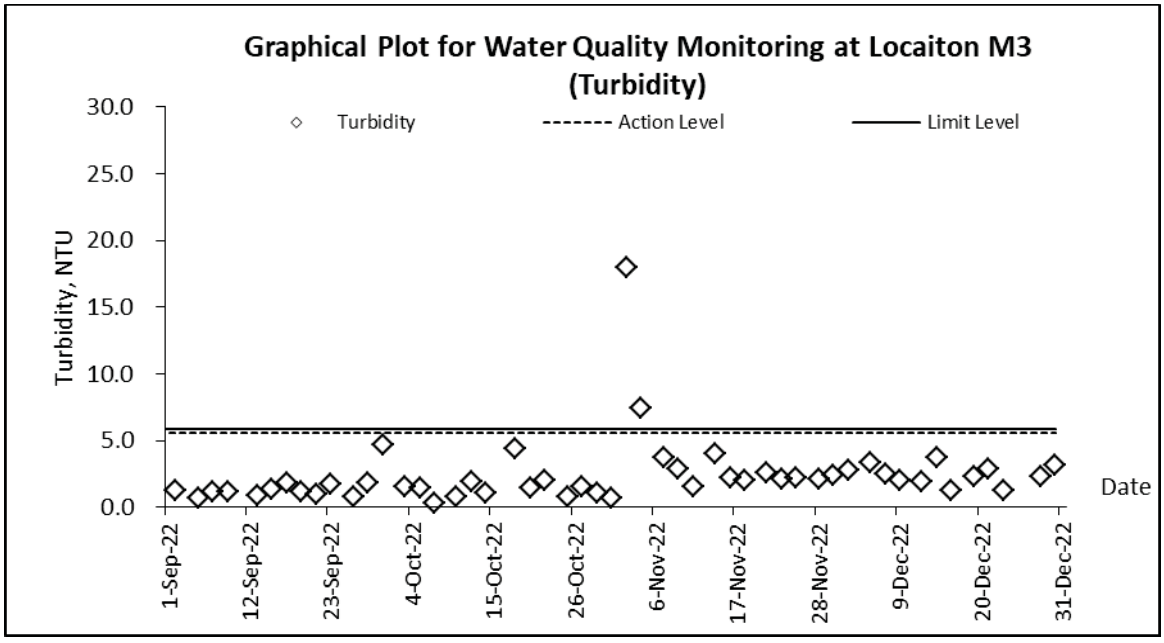


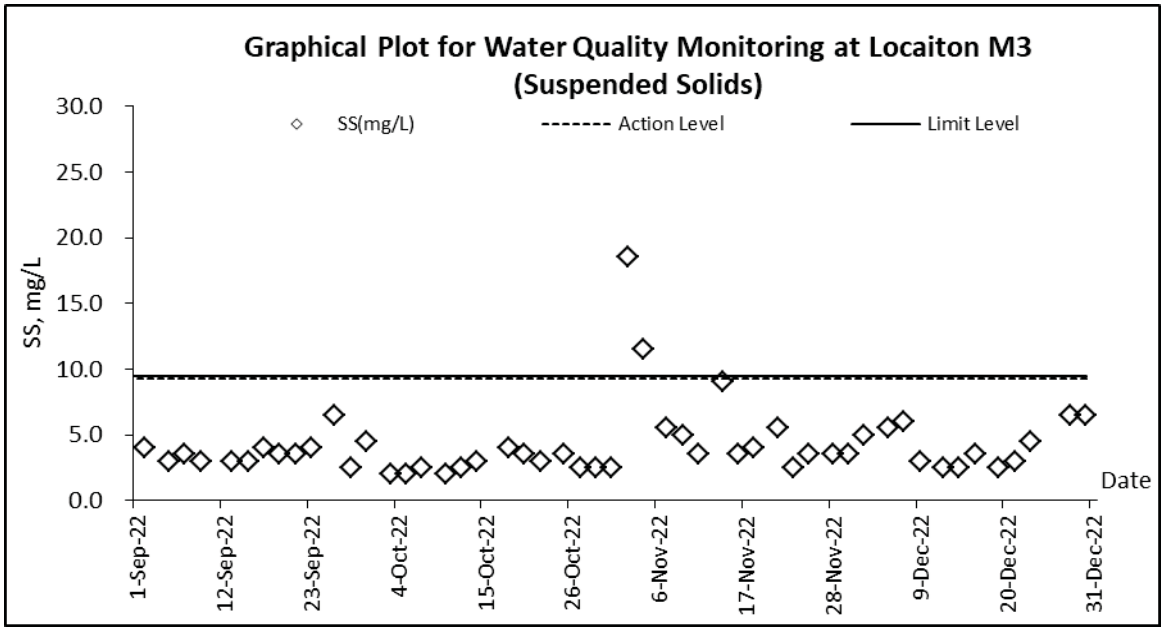

Graphical Plot for Water Quality Monitoring at Locaiton M2
(Dissolved Oxygen)
DO
Action Level
Limit Level
DO, mg/L
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Date
1-Sep-22
12-Sep-22
23-Sep-22
4-Oct-22
15-Oct-22
26-Oct-22
6-Nov-22
17-Nov-22
28-Nov-22
9-Dec-22
20-Dec-22
31-Dec-22

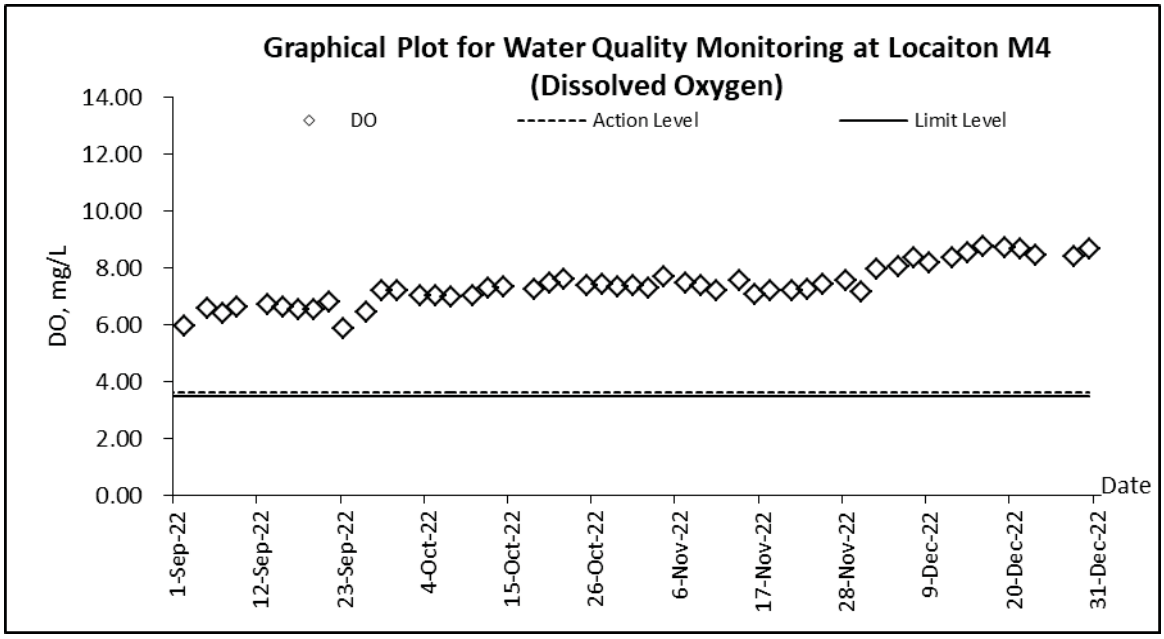

Graphical Plot for Water Quality Monitoring at Locaiton M2
(Turbidity)
Turbidity
Action Level
Limit Level
Turbidity, NTU
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Date
1-Sep-22
12-Sep-22
23-Sep-22
4-Oct-22
15-Oct-22
26-Oct-22
6-Nov-22
17-Nov-22
28-Nov-22
9-Dec-22
20-Dec-22
31-Dec-22

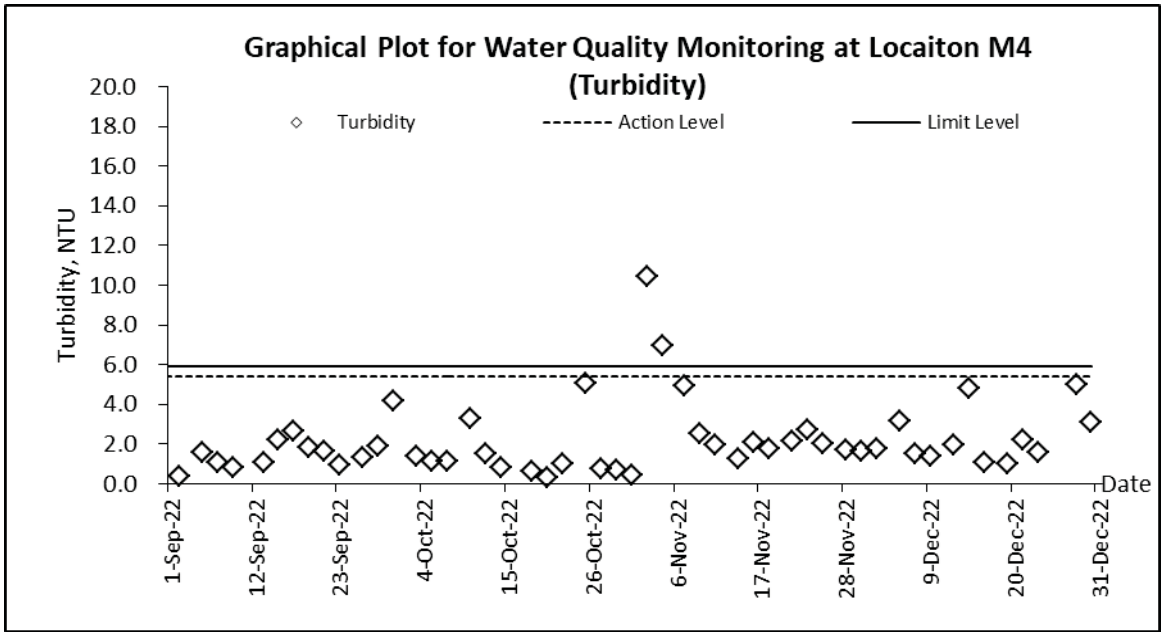

Graphical Plot for Water Quality Monitoring at Locaiton M2
(Suspended Solids)
SS(mg/L)
Action Level
Limit Level
SS, mg/L
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Date
1-Sep-22
12-Sep-22
23-Sep-22
4-Oct-22
15-Oct-22
26-Oct-22
6-Nov-22
17-Nov-22
28-Nov-22
9-Dec-22
20-Dec-22
31-Dec-22

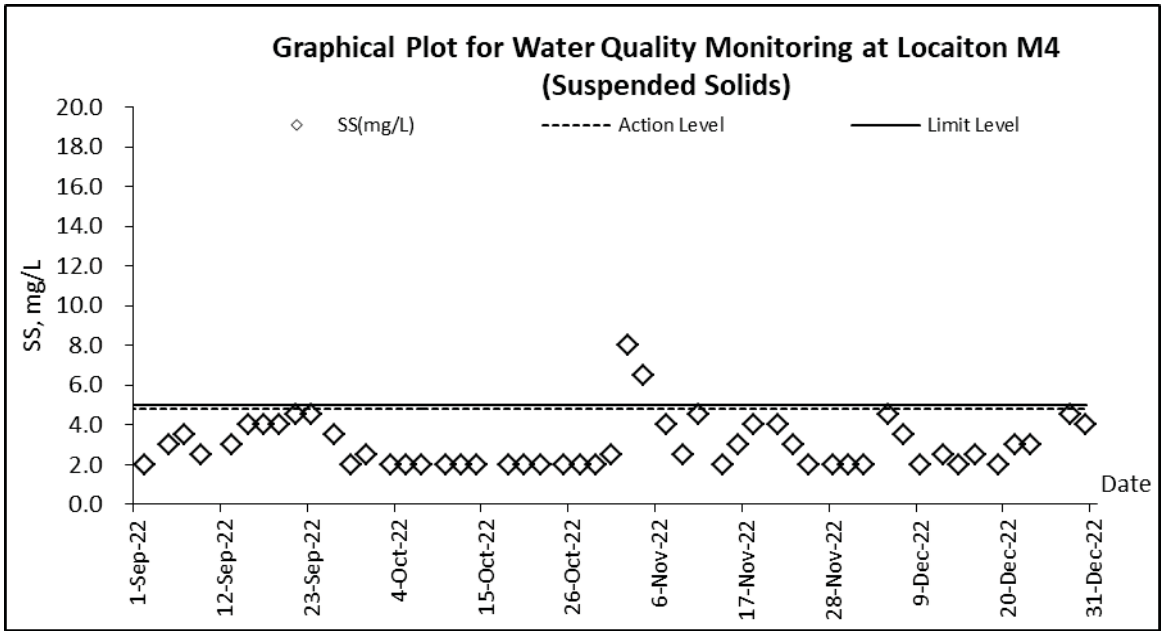

Graphical Plot for Water Quality Monitoring at Locaiton M3
(Dissolved Oxygen)
DO
Action Level
Limit Level
DO, mg/L
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Date
1-Sep-22
12-Sep-22
23-Sep-22
4-Oct-22
15-Oct-22
26-Oct-22
6-Nov-22
17-Nov-22
28-Nov-22
9-Dec-22
20-Dec-22
31-Dec-22


Graphical Plot for Water Quality Monitoring at Locaiton M3
(Turbidity)
Turbidity
Action Level
Limit Level
Turbidity, NTU
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Date
1-Sep-22
12-Sep-22
23-Sep-22
4-Oct-22
15-Oct-22
26-Oct-22
6-Nov-22
17-Nov-22
28-Nov-22
9-Dec-22
20-Dec-22
31-Dec-22


Graphical Plot for Water Quality Monitoring at Locaiton M3
(Suspended Solids)
SS(mg/L)
Action Level
Limit Level
SS, mg/L
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Date
1-Sep-22
12-Sep-22
23-Sep-22
4-Oct-22
15-Oct-22
26-Oct-22
6-Nov-22
17-Nov-22
28-Nov-22
9-Dec-22
20-Dec-22
31-Dec-22


Graphical Plot for Water Quality Monitoring at Locaiton M4
(Dissolved Oxygen)
DO
Action Level
Limit Level
DO, mg/L
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Date
1-Sep-22
12-Sep-22
23-Sep-22
4-Oct-22
15-Oct-22
26-Oct-22
6-Nov-22
17-Nov-22
28-Nov-22
9-Dec-22
20-Dec-22
31-Dec-22


Graphical Plot for Water Quality Monitoring at Locaiton M4
(Turbidity)
Turbidity
Action Level
Limit Level
Turbidity, NTU
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Date
1-Sep-22
12-Sep-22
23-Sep-22
4-Oct-22
15-Oct-22
26-Oct-22
6-Nov-22
17-Nov-22
28-Nov-22
9-Dec-22
20-Dec-22
31-Dec-22


Graphical Plot for Water Quality Monitoring at Locaiton M4
(Suspended Solids)
SS(mg/L)
Action Level
Limit Level
SS, mg/L
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Date
1-Sep-22
12-Sep-22
23-Sep-22
4-Oct-22
15-Oct-22
26-Oct-22
6-Nov-22
17-Nov-22
28-Nov-22
9-Dec-22
20-Dec-22
31-Dec-22

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-Dec-22	Thu	Cool. Cloudy to overcast with one or two rain patches.	Trace	19.7	10.7	70.7	N
2-Dec-22	Fri	It will be cool. Sunny periods in the afternoon.	0	15.6	10	66.2	Maintenance
3-Dec-22	Sat	Mainly cloudy tonight.	0	14.6	11.2	67.0	N
4-Dec-22	Sun	Moderate to fresh north to northeasterly winds.	0	16.9	7.5	70.2	N
5-Dec-22	Mon	Dry with sunny intervals in the afternoon.	0	17.6	6.2	73.0	N
6-Dec-22	Tue	Mainly cloudy and cool.	0	17.1	9	74.2	N
7-Dec-22	Wed	Dry with sunny periods in the afternoon.	Trace	17.2	12.7	65.0	N
8-Dec-22	Thu	Fine. Dry in the afternoon.	0	15.2	17	58.7	N/NE
9-Dec-22	Fri	Moderate north to northeasterly winds.	0	15.3	18	60.0	N/NE
10-Dec-22	Sat	Mainly cloudy and dry.	0	12.4	15.7	72.0	N
11-Dec-22	Sun	Moderate to fresh northerly winds	0	10.6	14	91.5	N/NE
12-Dec-22	Mon	Cloudy with one or two light rain patches.	Trace	Maintenance	5	Maintenance	N
13-Dec-22	Tue	Moderate to fresh northerly winds	3.2	15.1	9	90.7	N
14-Dec-22	Wed	Cold and cloudy to overcast with a few rain patches.	8.7	11.9	11.2	55.0	N
15-Dec-22	Thu	Cloudy to overcast with a few rain patches.	3.8	11.4	16	43.2	N/NE
16-Dec-22	Fri	Cloudy to overcast.	0.9	10.9	6	56.2	N/NE
17-Dec-22	Sat	Cool with one or two rain patches.	9.1	14.9	7.5	70.7	E/SE
18-Dec-22	Sun	Moderate northerly winds.	Trace	14.6	8.5	60.0	N
19-Dec-22	Mon	Fine and dry. Cold in the morning.	0	14.4	12.5	45.0	N/NE
20-Dec-22	Tue	Dry with sunny periods.	0	13.1	8.7	56.7	N/NE
21-Dec-22	Wed	Fine. Very dry in the afternoon.	Trace	13.2	10.2	51.0	N/NE
22-Dec-22	Thu	Fine and very dry. Rather cool tonight.	0	12.5	11.7	55.0	N/NE
23-Dec-22	Fri	Fine and very dry. Moderate northeasterly winds	0	15.4	12.5	57.5	N/NE
24-Dec-22	Sat	Moderate north to northeasterly winds, occasionally fresh.	0	14.7	8	64.2	E/SE
25-Dec-22	Sun	Moderate northeasterly winds, fresh later.	0	15.1	8.7	69.7	N/NE
26-Dec-22	Mon	Fine and very dry. Moderate northeasterly winds	0	14.7	9	62.2	N
27-Dec-22	Tue	Moderate northeasterly winds, fresh later.	0	12.7	11.7	66.7	N/NE
28-Dec-22	Wed	Fine and dry. Cool in the morning and at night.	0	12.8	10.5	67	N/NE
29-Dec-22	Thu	Fine and dry.	Trace	19.7	10.7	70.7	N
30-Dec-22	Fri	Rather cool in the morning.	0	15.6	10	66.2	Maintenance
31-Dec-22	Sat	Moderate northerly winds, fresh offshore at first.	0	14.6	11.2	67.0	N

Appendix K

Ecological Survey Report

Ecological Survey Report for Contract CV/2016/10

Muni Arborist

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 – December 2022

Revision Date of issue	0 6 January 2023	
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 conversation importance were recorded in EIA report from this habitat: East Asian Porcupine, Leopard Cat, Red Muntjac, Two-striped Grass Frog, Small Snakehead, *Somanniathelphusa 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 24th December 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 would be identified and counted as accurately as possible.

- Mammal

  There was no mammal species recorded in the monitoring area.

- Bird

  There were a total of 22 birds individuals from 13 species recorded in the monitoring area. No Golden-headed Cisticola was observed during the bird survey.

- Herpetofauna

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

- Butterfly

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

- Dragonfly

  There was no odonate species recorded in the monitoring area.

- Freshwater communities

  There was no freshwater community recorded in the monitoring area.

Picture 1

Grey-backed Thrush *(Turdus hortulorum)* 灰背鶇

Picture 2

Siberian Rubythroat *(Calliope calliope)* 紅喉歌鴝

Table 4 Result of mammal in survey

Scientific Name	Common Name	Chinese Name	Conservation Status	24/12/2022				
				Non-wetland		Wetland		
				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	24/12/2022				
				Non-wetland		Wetland		
				UG	WL	MA	WW	WC
Spilopelia chinensis	Spotted Dove	珠頸斑鳩		2				
Lanius schach	Long-tailed Shrike	棕背伯勞					1	
Pycnonotus jocosus	Red-whiskered Bulbul	紅耳鵯		5				
Zoothera aurea	White's Thrush	虎斑地鶇		1				
Turdus hortulorum	Grey-backed Thrush	灰背鶇		1				
Calliope calliope	Siberian Rubythroat	紅喉歌鴝					1	
Phylloscopus fuscatus	Dusky Warbler	褐柳莺		1				
Phylloscopus inornatus	Yellow-browed Warbler	黃眉柳莺		1				
Prinia flaviventris	Yellow-bellied Prinia	黃腹鷦莺					2	
Orthotomus sutorius	Common Tailorbird	長尾縫葉莺		1			1	
Garrulax perspicillatus	Masked Laughingthrush	黑臉噪鹛					2	
Phoenicurus auroreus	Daurian Redstart	北紅尾鴝		1				
Anthus godlewskii	Olive-backed Pipit	樹鷚		2				

*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	24/12/2022				
				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	24/12/2022				
				Non-wetland		Wetland		
				UG	WL	MA	WW	WC
N/A								

*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	24/12/2022				
				Non-wetland		Wetland		
				UG	WL	MA	WW	WC
Abisara echerius	Plum Judy	蛇目褐蜆蝶		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	24/12/2022				
				Non-wetland		Wetland		
				UG	WL	MA	WW	WC
N/A								

*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	24/12/2022				
				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 December 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.

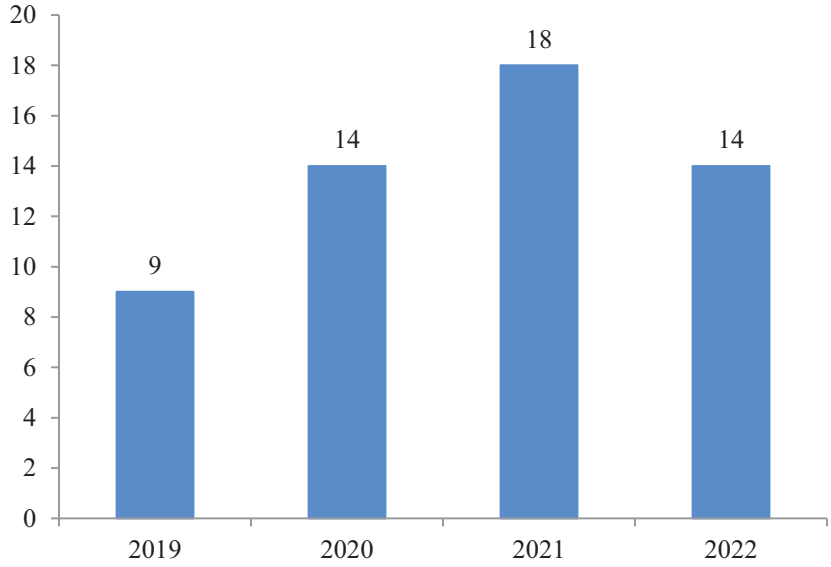


Figure 1: Bar chart showing the total species richness within site boundary from 2019 to 2022 (Actual quantity annotated at the top of each bar)

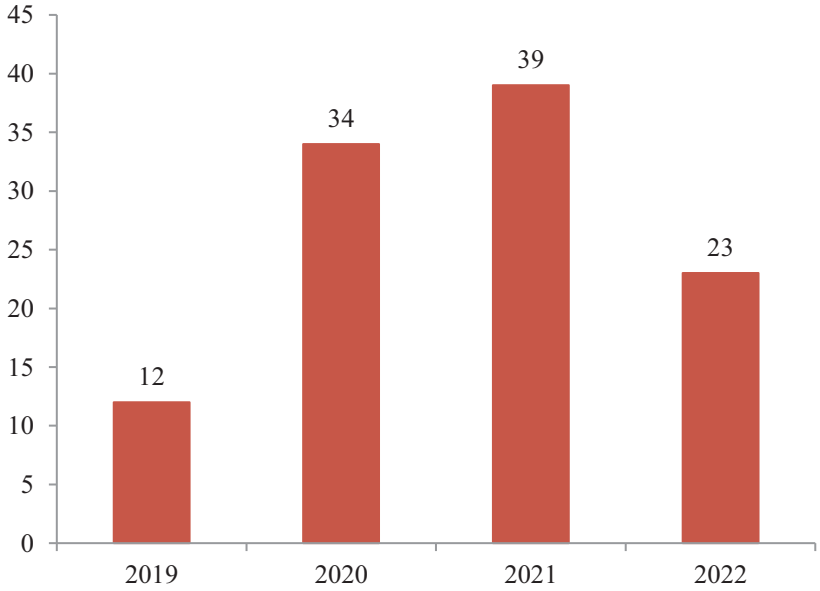


Figure 2: Bar chart showing the total abundance within site boundary from 2019 to 2022 (Actual quantity annotated at the top of each bar)

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.

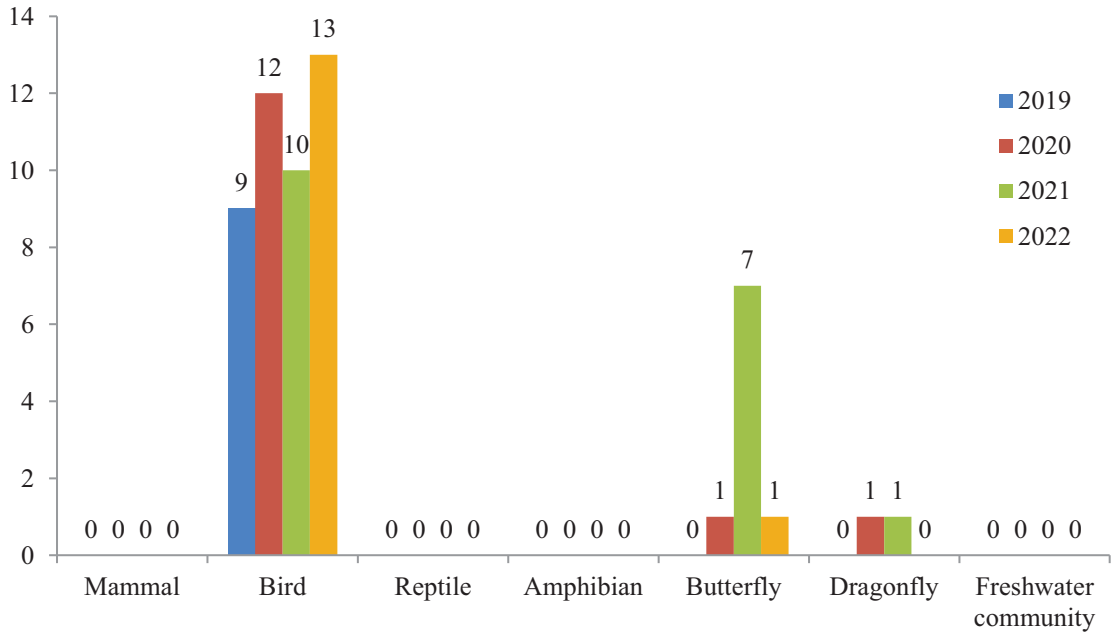


Figure 3: Bar chart showing the species richness within site boundary by taxa from 2019 to 2022
(Actual quantity annotated at the top of each bar)

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 December over years were compared in Figures 4 and 5.

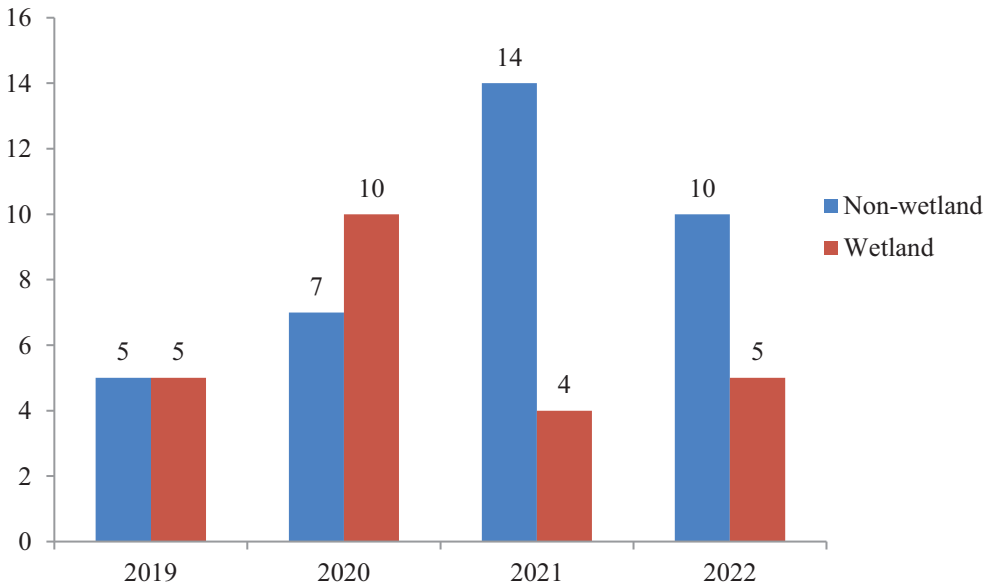


Figure 4: bar chart showing the species richness based on habitat type from 2019 to 2022
(Actual quantity annotated at the top of each bar)

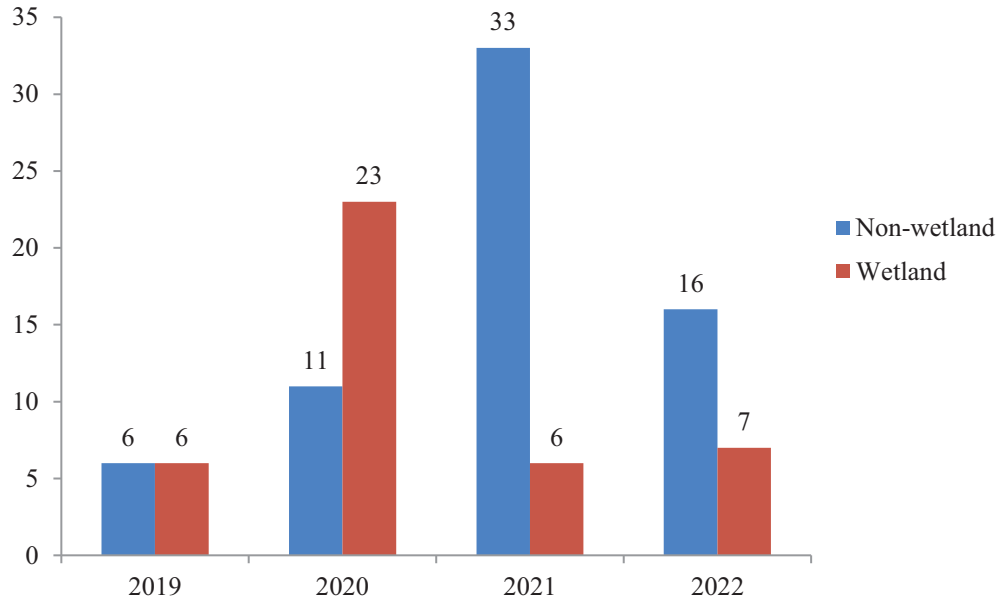
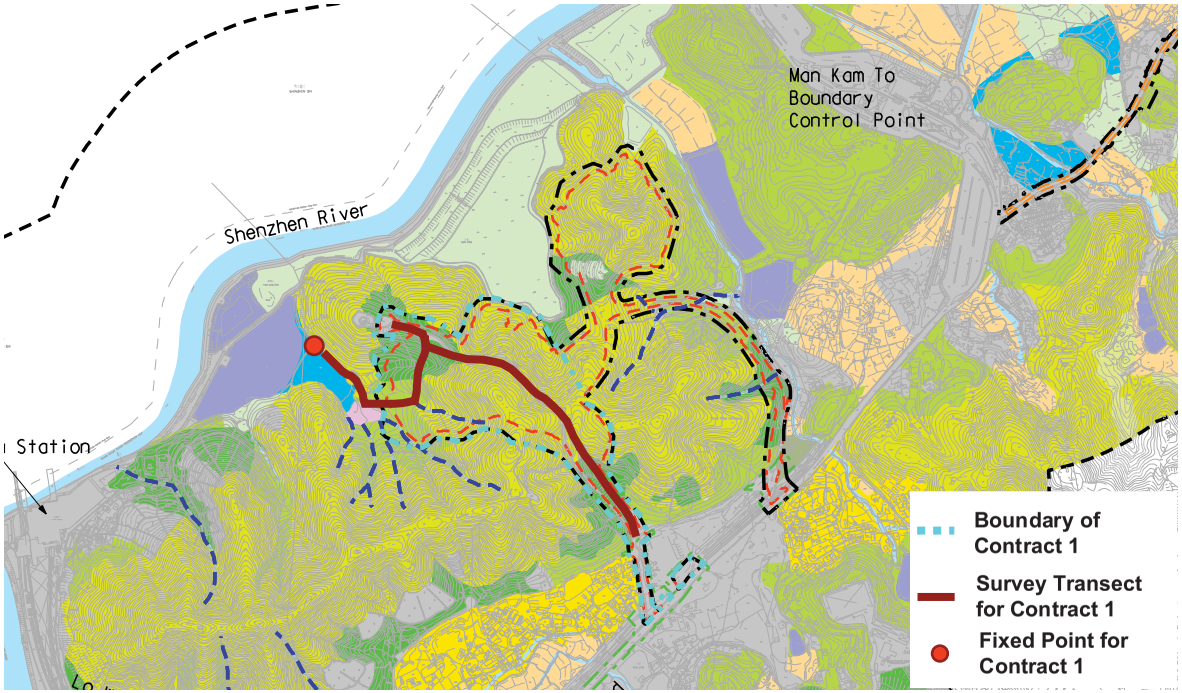


Figure 5: bar chart showing the abundance based on habitat type from 2019 to 2022
(Actual quantity annotated at the top of each bar)

5.4 After analysing survey results in December from 2019 to 2022, there was no significant drop in species richness and abundance for wetland habitat. 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. 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

Muni Arborist

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 – December 2022

Revision	0	
Date of issue	6 January 2023	
Prepared by	Alan Lam	
Reviewed by	Rachel Siu	
Verified by	Mike Leung	

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Muni Arborist

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Figure 1	Bar chart showing the total species richness within site boundary from 2019 to 2022
Figure 2	Bar chart showing the total abundance within site boundary from 2019 to 2022
Figure 3	Bar chart showing the species richness within site boundary by taxa from 2019 to 2022
Figure 4	Bar chart showing the species richness based on habitat type from 2019 to 2022
Figure 5	Bar chart showing the abundance based on habitat type from 2019 to 2022

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	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 conversation importance were recorded in EIA report from this habitat: East Asian Porcupine, Leopard Cat, Red Muntjac, Two-striped Grass Frog, Small Snakehead, *Somanniathelphusa 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 24th December 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 would be identified and counted as accurately as possible.

- Mammal

  There was no mammal recorded in the monitoring area.

- Bird

  There were total of 11 bird individuals from 3 species recorded in the monitoring area. No Golden-headed Cisticola was observed during the bird survey.

- Herpetofauna

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

- Butterfly

  There was no butterfly species recorded in the monitoring area.

- Dragonfly

  There were total of 4 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	24/12/2022				
				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	24/12/2022				
				UG	WL	MA	WW	WC
Pycnonotus jocosus	Red-whiskered Bulbul	紅耳鵯					5	
Prinia flaviventris	Yellow-bellied Prinia	黃腹鷦鶯		2				
Garrulax perspicillatus	Masked Laughingthrush	黑臉噪鶥		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	24/12/2022				
				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	24/12/2022				
				UG	WL	MA	WW	WC
N/A								

*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	24/12/2022				
				UG	WL	MA	WW	WC
N/A								

*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	24/12/2022				
				UG	WL	MA	WW	WC
Pantala flavescens	Wandering Glider	黃蜻						4

*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	24/12/2022				
				UG	WL	MA	WW	WC
Gambusia affinis	Mosquito fish	食蚊魚						+
Puntius semifasciolatus	Chinese Barb	五線無鬚鮣						+

*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 December over years were compared to show the trends. Figures 1 and 2 indicate total species richness and total abundance within the site boundary respectively.

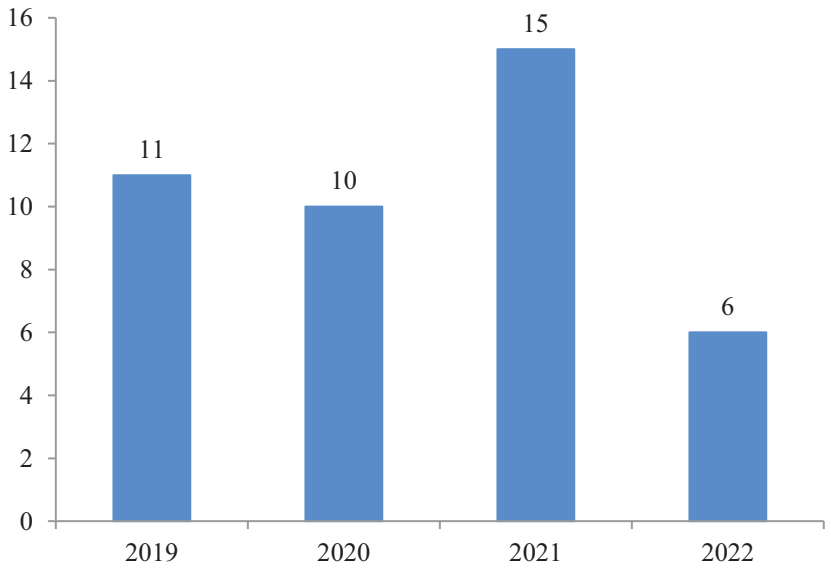

Figure 1: Bar chart showing the total species richness within site boundary from 2019 to 2022 (Actual quantity annotated at the top of each bar)

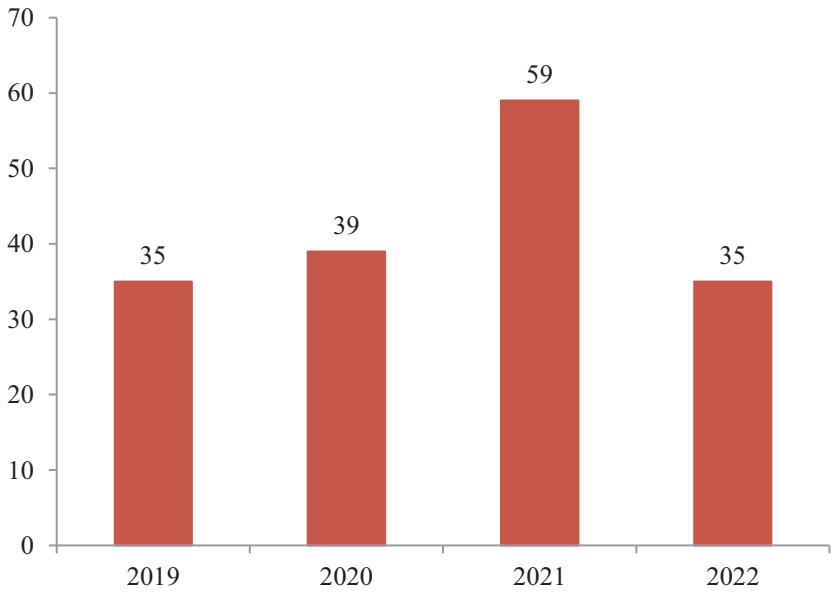

Figure 2: Bar chart showing the total abundance within site boundary from 2019 to 2022 (Actual quantity annotated at the top of each bar)

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.

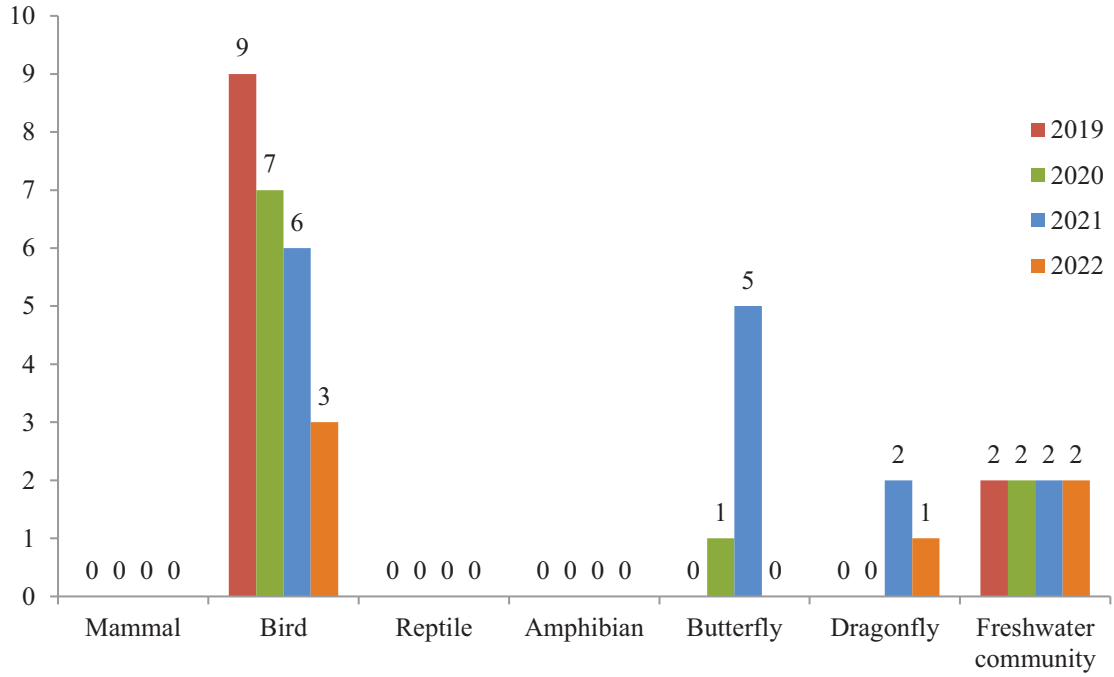

Figure 3: Bar chart showing the species richness within site boundary by taxa from 2019 to 2022
(Actual quantity annotated at the top of each bar)

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 December over years were compared in figures 4 and 5.

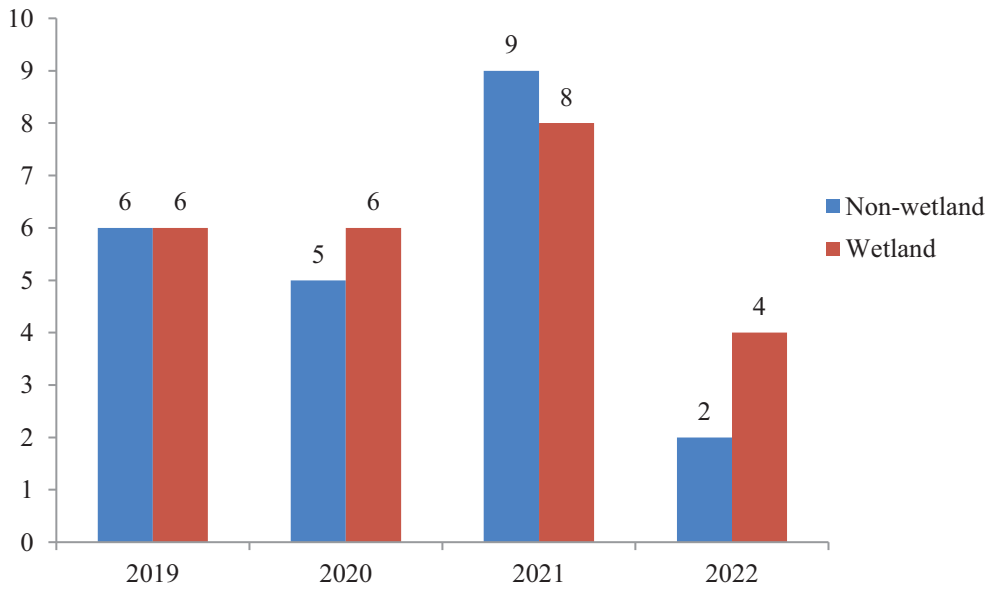

Figure 4: bar chart showing the species richness based on habitat type from 2019 to 2022
(Actual quantity annotated at the top of each bar)

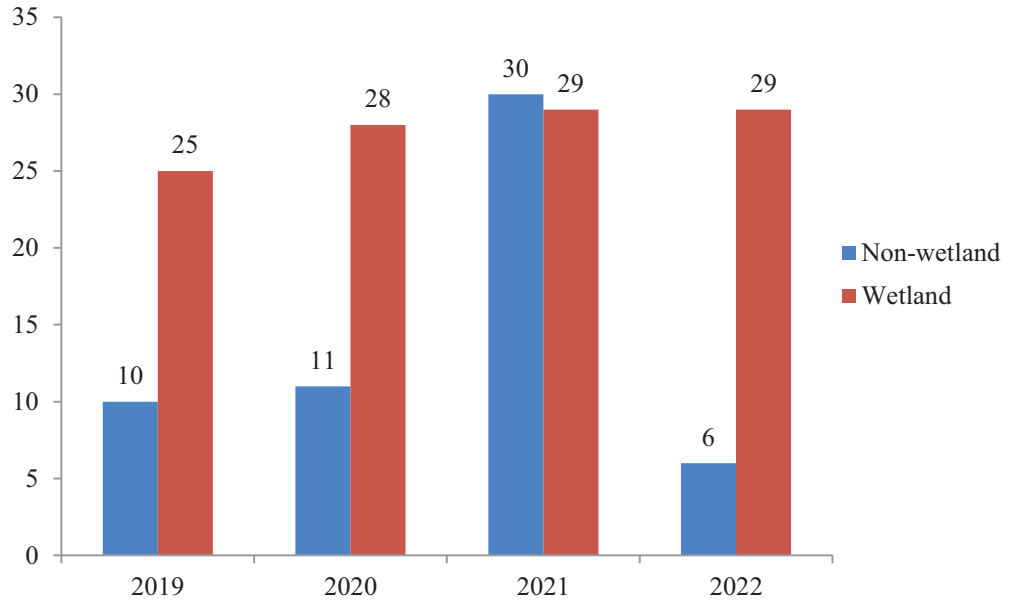

Figure 5: bar chart showing the abundance based on habitat type from 2019 to 2022
(Actual quantity annotated at the top of each bar)

5.4 After analysing survey results in December from 2019 to 2022, there was no significant drop 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. 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

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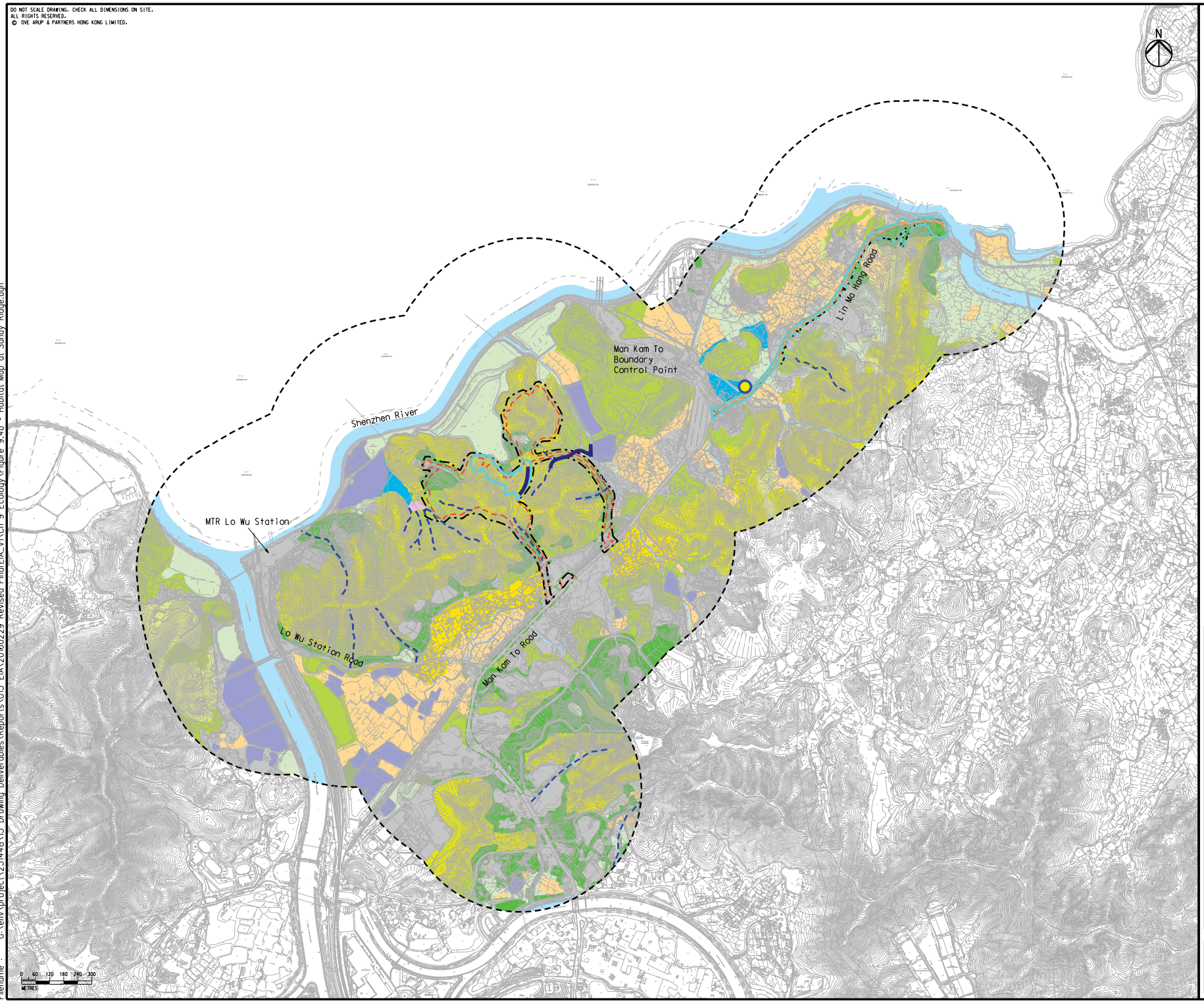

Legend

- 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**

Rev	Description	By	Date
G	SEVENTH ISSUE	GL	02/16
F	SIXTH ISSUE	GL	01/16
E	FIFTH ISSUE	GL	12/15
D	FOURTH ISSUE	GL	10/15

Consultant

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.	Rev.
Figure 9.4b	G

Drawn	Date	Checked	Approved
GL	02/16	EL	ST

Scale	Status
AS SHOWN	PRELIMINARY

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Printed by : 2/29/2016
Filename : G:\env\project\231448\13 Drawing Deliverables\Reports\015 EIA\20160229 Revised Final EIA_v1\Ch 9 Ecology\Figure 9.4b - Habitat Map at Sandy Ridge.dgn

Appendix L

Landscape & Visual Inspection Checklist

Muni Arborist

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: 29/12/2022 10:00 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 trees T2465 and T2928 were in fair health condition with normal foliage color and density. Contractor is reminded to provide proper maintenance according to approved method statement.

Photo Record:

Fig A.

General view (1)

Fig B.

General view (2)

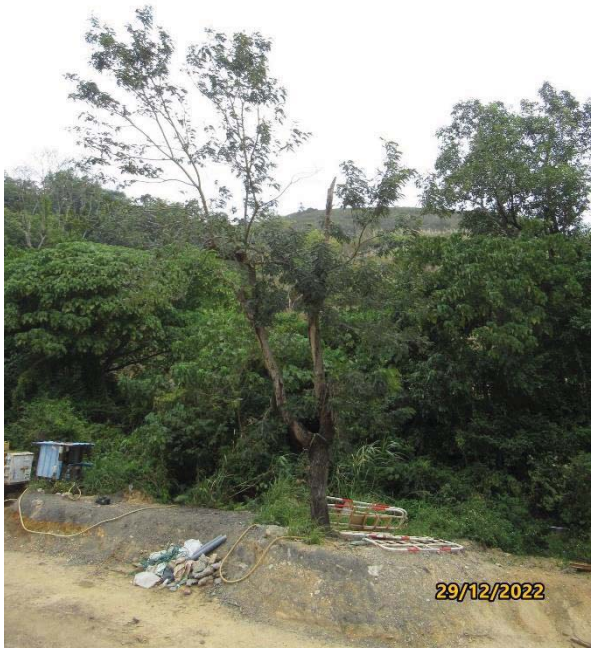
Fig C.

General view (3)

Fig D.

General view (4)

Fig E.



Transplanted tree (T-2465)

Fig F.

Transplanted tree (T-2928)

Muni Arborist

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: 29/12/2022 11:00 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)

Muni Arborist

Signature:

		Signature	Date
Recorded by	Registered Landscape Architect		29 Dec 2022
Checked by	Environmental Team Leader		10 Jan 2023
	Independent Environmental Checker		12 Jan 2023

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 Assoicated 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	0.380	0.000	0.100	0.000	0.380	0.000	0.000	0.000	0.000	0.000	0.020
Aug	0.715	0.000	0.115	0.000	0.600	0.000	0.000	0.000	0.000	0.000	0.002
Sept	0.288	0.000	0.100	0.000	0.200	0.000	0.000	0.000	0.000	0.000	0.150
Oct	0.734	0.000	0.120	0.000	0.700	0.000	0.000	0.000	0.000	0.000	0.130
Nov	0.556	0.000	0.100	0.000	0.510	0.000	0.000	0.000	0.000	0.000	0.160
Dec	0.700	0.000	0.100	0.000	0.600	0.000	0.000	0.000	0.000	0.000	0.048
Total	**7.857**	**0.000**	**1.935**	**0.000**	**5.586**	**0.588**	**0.000**	**0.000**	**0.000**	**0.000**	**0.647**

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	1304.780	0.000	0.000	0.000	1304.78	0.000	0.000	0.000	0.000	0.000	0.000
AUG	606.890	0.000	0.000	0.000	606.89	0.000	0.000	0.000	0.000	0.000	2.060
SEP	365.730	0.000	0.000	0.000	365.73	0.000	0.000	0.000	0.000	0.000	7.530
OCT	2051.540	0.000	0.000	0.000	2051.54	0.000	0.000	0.000	0.000	0.000	13.220
NOV	991.870	0.000	0.000	0.000	991.87	0.000	0.000	0.000	0.000	0.000	10.240
DEC	313.860	0.000	0.000	0.000	313.86	0.000	0.000	0.000	0.000	0.000	4.670
Total	8870.850	0.000	0.000	0.000	8870.850	0.000	0.000	0.000	0.000	0.000	86.530

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 and 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 Included in EM&A Report – Apr 2020
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
4	14-July-22	EPD	EPD Ref.: N07/RN/00014141-22	Soil/muddy water	Non-project related	Interim IR was submitted to EPD on 19 Aug 2022 and included in EM&A Report – Aug 2022
5	23-9-22	EPD	EPD Ref.: N07/RN/00020415-22	Air Quality	Non-project related	Interim IR was submitted to EPD on 30 Sep 2022 and included in EM&A Report – Sep 2022

Appendix O

Implementation Schedule for Environmental Mitigation Measures

Environmental Mitigation Implementation Schedule – Sandy Ridge

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*
Common Mitigation Measures (Applicable to ALL Project Components, including DPs and Non-DPS)							
Construction Dust Impact							
S4.4.5.2	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Minimise dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction phase	• APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria	Implemented.
S4.4.5.3	Water spraying every hour for all active works area.	Minimise dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction phase	• APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria	Implemented. *2 nos. of water truck were running on haul road for sufficient water spraying
S4.4.5.2	• Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones; • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a	Minimise dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction phase	• APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria	Implemented. Implemented Implemented Implemented Implemented Implemented Implemented 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*
	dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.						Implemented Implemented Implemented Implemented Implemented
S4.4.5.1	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected representative dust monitoring station	Construction phase	• TM-EIAO	Implemented. 3 dust monitoring stations were Implemented.
S4.4.5.3	• All road surface within the barging facilities will be paved. • Dust enclosures will be provided for the loading ramp, installation of 3- sided screen with top cover and the provision of water sprays at the discharge point would be provided. • Vehicles will be required to pass through designated wheel wash facilities. • Continuous water spray at the loading point.	Minimise dust impact at the nearby sensitive receivers	Contractor	Barging point at Siu Lam	Construction phase	• TM-EIAO	No Applicable. * Barging point at Siu Lam is not in used.
Construction Noise							
S5.5.5.3	Implement the following good site management practices: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, mobile container site office and other structures should be effectively utilised, where practicable, to screen noise from onsite construction	Control construction noise	Contractor	All construction sites	Construction phase	• Annex 5, TM-EIAO	Implemented Implemented Implemented Implemented Implemented 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*
	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	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: *For existing representative NSRs* • 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*
	Road near Muk Wu Nga Yiu (MM13); • Approx. 31m of absorptive noise barrier 5m above road level along Lin Ma Hang Road near Muk Wu Nga Yiu (MM14); • Approx. 31m of absorptive noise barrier 5m above road level along Lin Ma Hang Road near Muk Wu Nga Yiu (MM15); • Approx. 41m of absorptive noise barrier 5m above road level along Lin Ma Hang Road near Muk Wu Nga Yiu (MM16); • Approx. 340m of low noise surfacing materials along Lin Ma Hang Road near Muk Wu Nga Yiu (MM17).						
Water Quality (Construction Phase)							
S6.4.4.1 – S6.4.4.3	In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), construction phase mitigation measures shall include the following: *General Site Operation* • At the start of site establishment, perimeter cut-off drains to direct offsite water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities. The design of the temporary on-site drainage system will be undertaken by the contractor prior to the commencement of construction; • Diversion of natural stormwater should be avoided as far as possible. The design of temporary on-site drainage should prevent runoff going through site surface, construction machinery and equipment in order to avoid or minimise polluted runoff. Sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m^3 capacities are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity shall be flexible and able to handle multiple inputs from a variety of sources and suited to applications where the influent is pumped; • The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a site/sediment trap. The sediment/silt traps should be incorporated in the permanent drainage channels to enhance deposition rates; • The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94. The detailed design of the sand/silt traps shall be undertaken by the contractor prior to the commencement of construction; • Construction works should be programmed to minimise surface excavation works during the rainy seasons (April to September). All exposed earth areas should be	To minimise water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where applicable	Construction phase	• Water Pollution Control Ordinance • ProPECC PN1/94 • TM-EIAO • TM-DSS	Implemented Implemented Implemented Implemented 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*
	completed and vegetated as soon as possible after earthworks have been completed. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means;						
	• If the excavation of trenches in wet periods is necessary, it should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities;						Implemented
	• All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas;						Implemented
	• All open stockpiles of construction materials (for example, aggregates, sand and fill material) of more than 50m3 should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system;						Implemented
	• Manholes (including newly constructed ones) should always be covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers;						Implemented
	• Precautions be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes;						Implemented
	• All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable.						Implemented
	• Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains;						Implemented
	• Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain;						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*
	• 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.						Implemented Implemented Implemented Implemented
S6.4.4.4 – S6.4.4.5	*Sewage from workforce* • 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	• Water Pollution Control Ordinance • TM-DSS	Implemented Implemented Implemented
S6.4.4.6	*Operation of Barging Point at Siu Lam* • 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	• Water Pollution Control Ordinance • TM-DSS	No Applicable. * Barging point at Siu Lam is not in used.
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	The following mitigation measures during operational phase are recommended: • 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	• Water Pollution Control Ordinance • TM-DSS	For Operational phase
Waste Management (Construction Waste)							
S7.3.3.8	<u>Construction & Demolition Material Management Plan (C&DMMP)</u> • 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	• Project Administrative Handbook for Civil Engineering Works, 2012 Edition	
S7.3.4.2	<u>Good Site Practice</u> The following good site practices are recommended throughout the construction activities: • 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	• Waste Disposal Ordinance	Implemented Implemented Implemented Implemented Implemented 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*
S7.3.4.3	Waste Reduction Measures 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: • 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	• Waste Disposal Ordinance	Implemented Implemented Implemented Implemented Implemented
S7.3.4.5	Storage of Waste The following recommendation should be implemented to minimise the impacts: • 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	• Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005	Implemented Implemented Implemented
S7.3.4.6	Collection and Transportation of Waste The following recommendation should be implemented to minimise the impacts: • 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	• Waste Disposal Ordinance	Implemented Implemented Implemented Implemented
S7.3.4.8 – S7.3.4.15	Excavated and C&D Materials 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: • 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	• Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance	Implemented Implemented 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*
	• 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 Implemented
S7.3.4.17 – S7.3.4.18	Chemical Waste 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.	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction phase	• Waste Disposal (Chemical Waste) General) Regulation • Code of Practice on the Packaging, Labelling and Storage of Chemical Waste	Implemented
S7.3.4.19	General Refuse • 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	• Waste Disposal Ordinance	Implemented Implemented Implemented
S7.3.4.20	Sewage • 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	• Waste Disposal Ordinance	Implemented Implemented
Waste Management (Operational Waste)							
S7.4.4.1	General Refuse A reputable waste collector should be employed to remove general refuse on a daily basis.	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	• 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)	• 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	• 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*
		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.					
S9.7.2.5 – S9.7.2.6	Preparation and submission of a Vegetation Survey Report and Transplantation Proposal (if needed as concluded in the Vegetation Survey Report) to EPD for agreement.	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. The Transplantation Proposal will recommend locations of the receptor site(s), transplantation methodology, implementation programme of transplantation and post-transplantation monitoring	Project Proponent/ Detailed Design Consultant (qualified ecologist/ botanist) for Vegetation Survey Report and Transplantation Proposal.	Within the Project Area where applicable	Prior to construction phase	• Survey findings and transplantation methodology to be detailed in Vegetation Survey Report and Transplantation Plan respectively. • TM-EIAO.	Implemented * Vegetation Survey Report and Transplantation Proposals for Contract 1 and Contract 2 were 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*
		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	• 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	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. 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). 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.	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	• 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	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. 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. Works will be restricted to daytime and any construction lighting should be designed and positioned as to not impact on adjacent ecologically sensitive areas.	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	Contractor Project Proponent	All construction sites	Prior to commencement and during construction phase	• TM-EIAO.	
.9.7.3.7	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: • 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	Minimise impacts on hydrological condition and water quality of hillside watercourses and reduce chances of hillfires.	Contractor	All construction sites	Prior to commencement and during construction phase	• TM-EIAO.	Implemented 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*
	watercourses; • 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.						Implemented Implemented Implemented Implemented Implemented
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	• 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	• 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	• 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	<u>Mitigation for Impacts to Water Quality and Hydrology (Operational Phase)</u> • 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.	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. 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. The proposed small diameter bore pile system at the foundation of the	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	• 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	Minimise the potential indirect light disturbance on the Street Lighting on fireflies surrounding the Project Site during operational phase • It is considered that at the detailed design stage, street lighting of similar lux/light intensity as to what is currently present is utilised. 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.	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	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. 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. This will require input in the detailed design phase.	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 *in situ* 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	CM1 – 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 anddemolition 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	• 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	• '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	• 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	• 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..

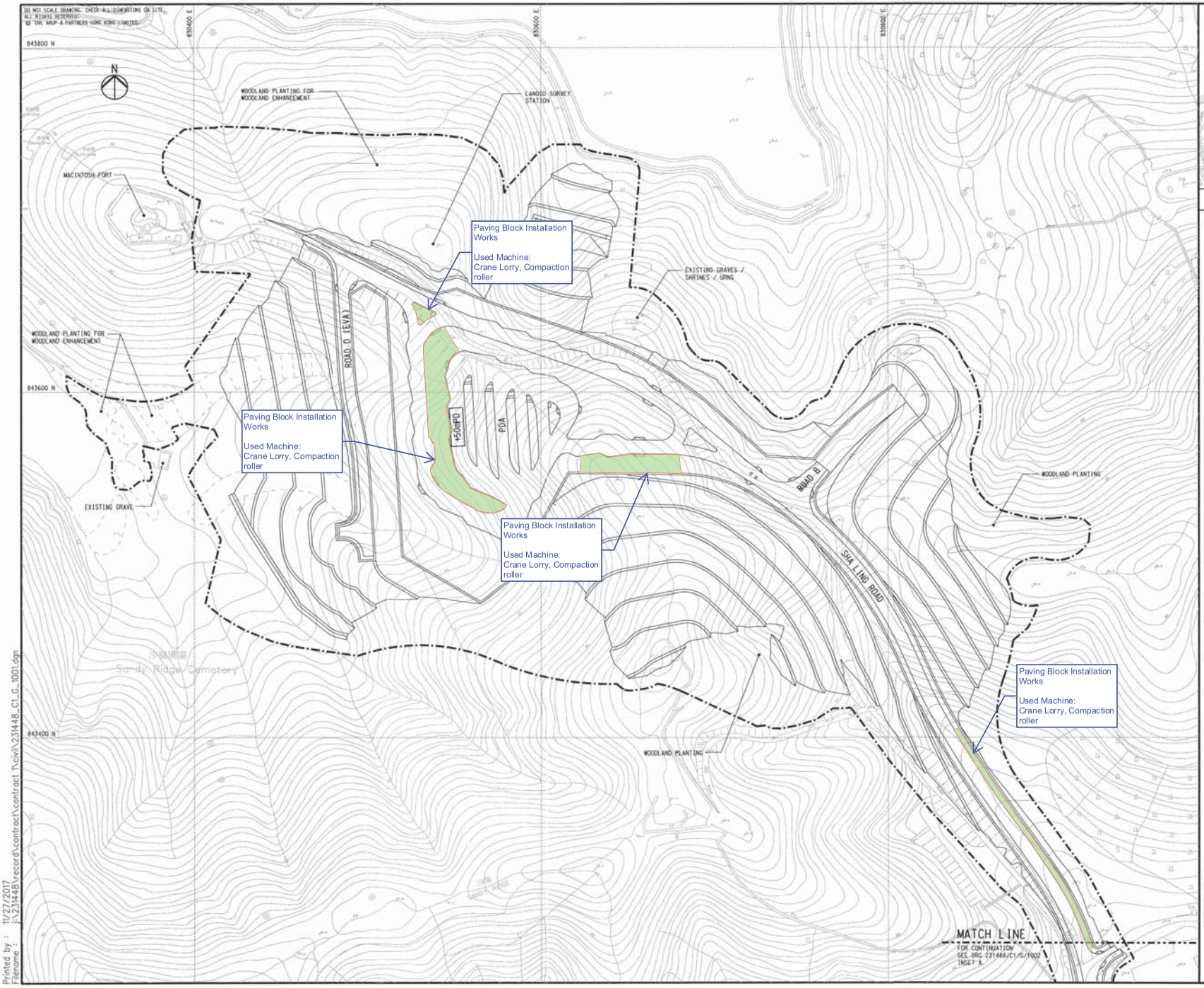
(e) The landscape mitigation treatment of the future development site shall follow the below frameworks:

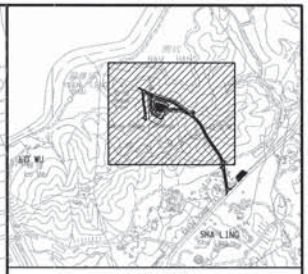
- Buffer planting shall be provided to soften the edge of the site.
- Aesthetic landscape treatment including both soft and hard landscape features shall be provided.
- Vertical greening shall be provided as far as practicable.
- At-grade tree planting shall be provided as far as possible while planting 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*
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	• EIAO Guidance Note No.4/2010 • TM-EIAO	Implemented
S13.2.1.1 – S13.4.1.2	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	• EIAO Guidance Note No.4/2010 • TM-EIAO	Implemented

Appendix P

Illustrations of Site Activities





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.	Rev.
231448/C1/G/1001	–

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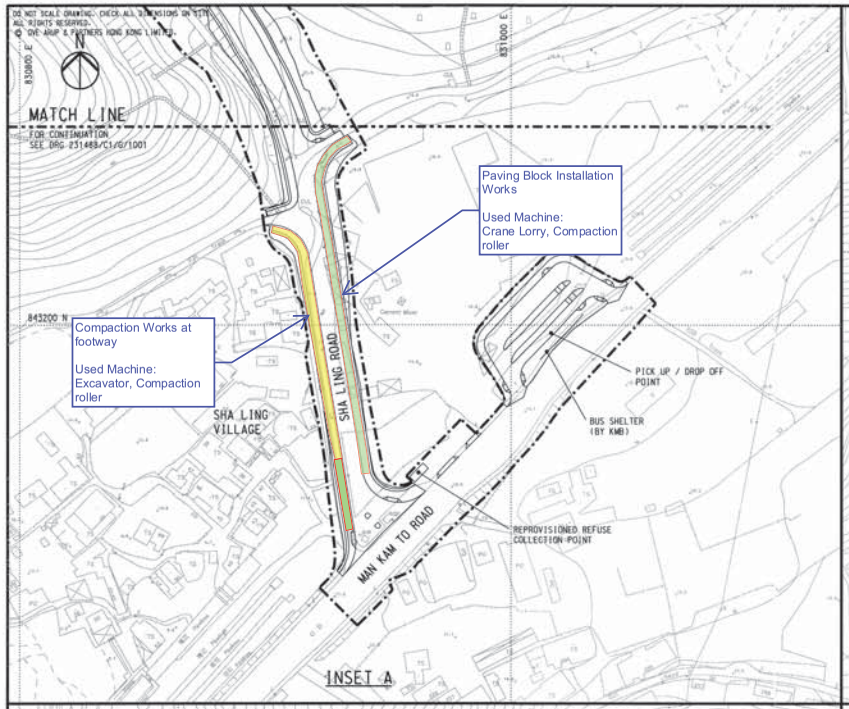

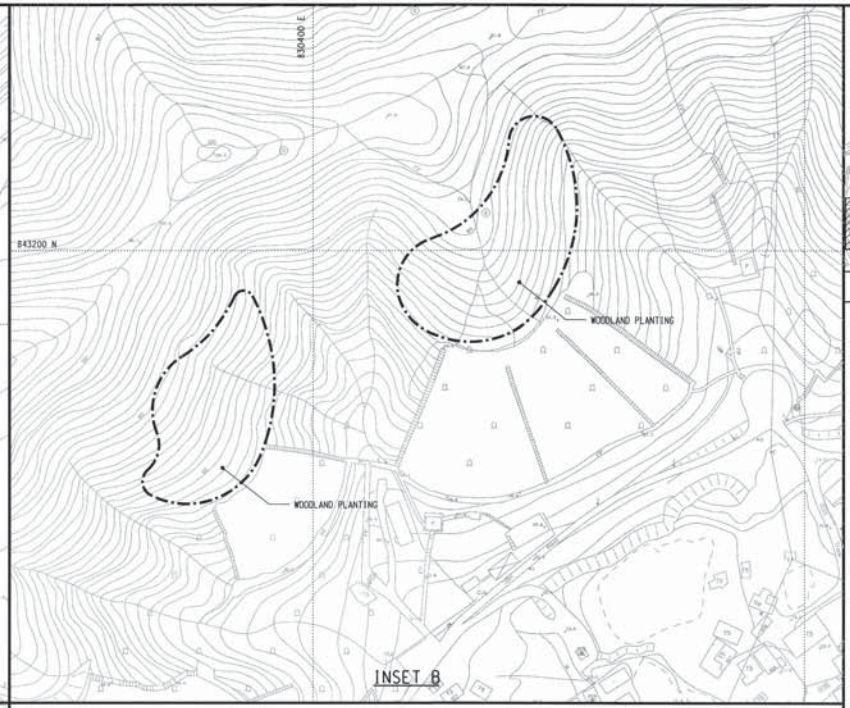

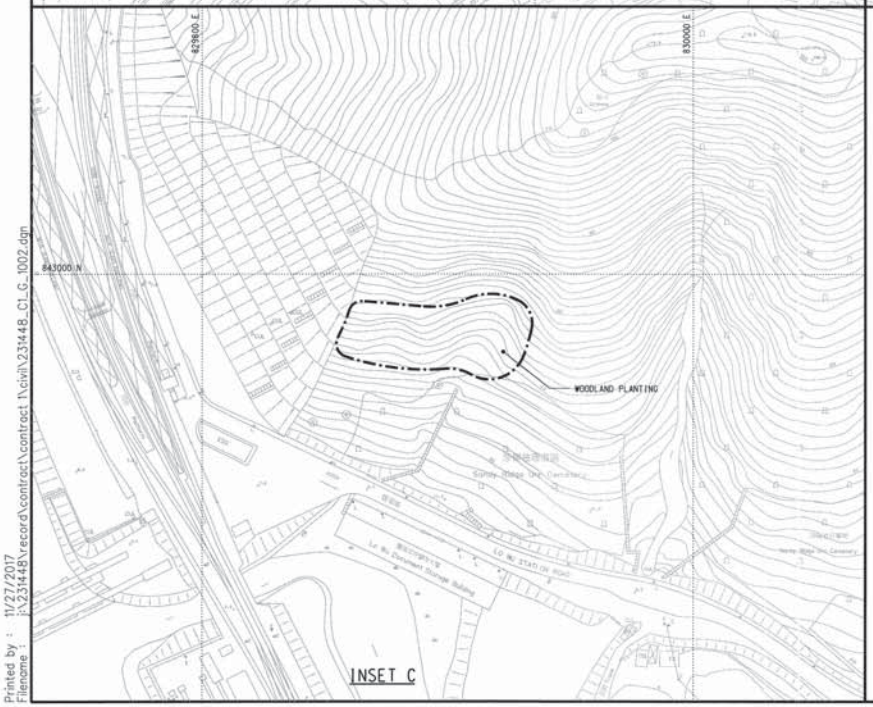

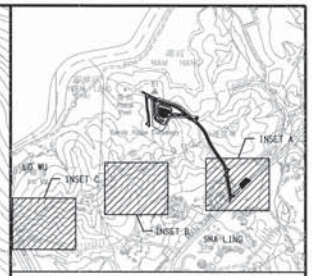

KEY PLAN

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)

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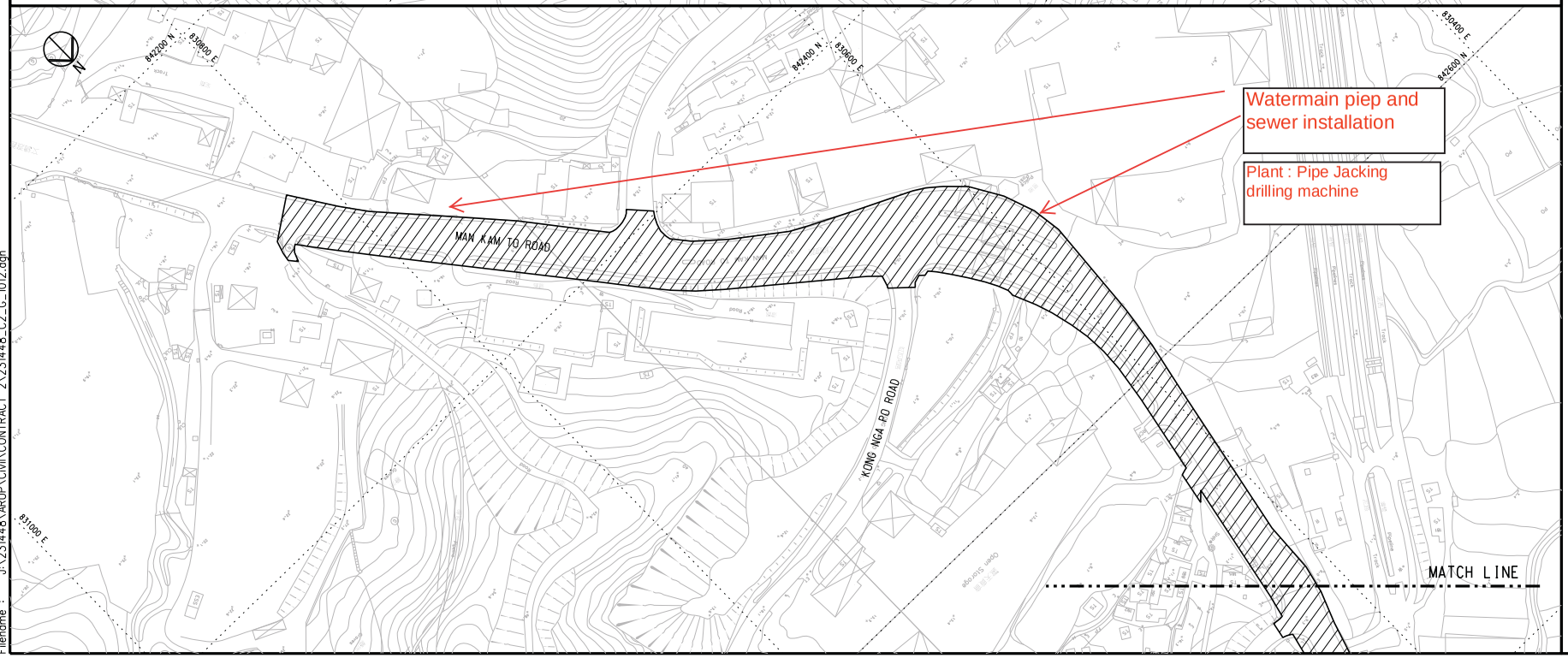

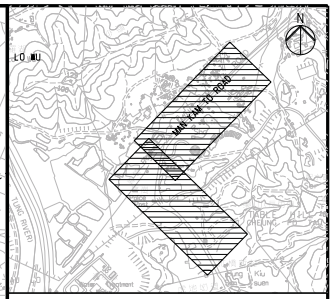

KEY PLAN

NOTE:

1. 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.
2. 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

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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)

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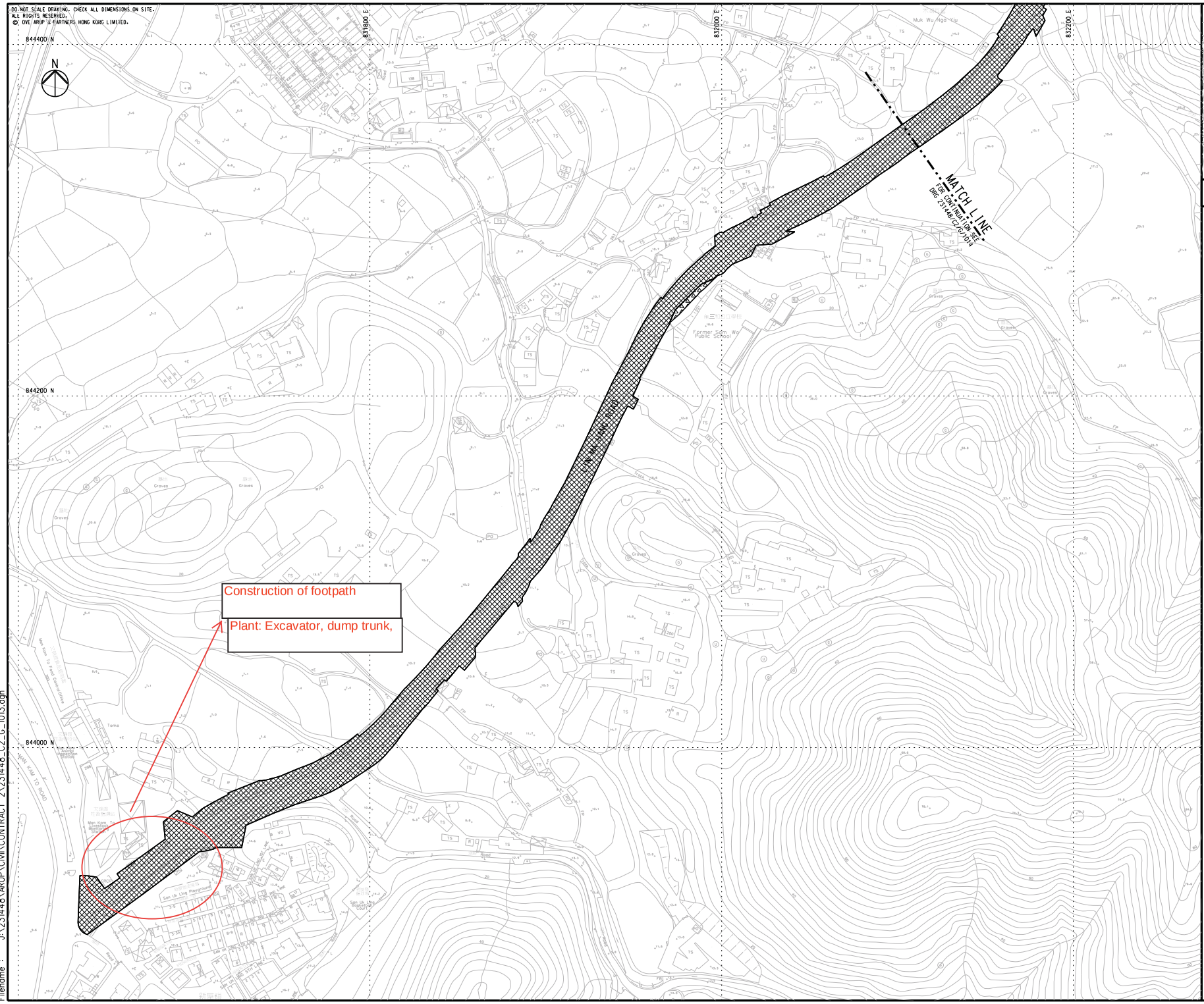

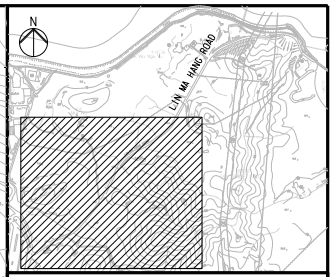

KEY PLAN

NOTE:

1. 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.

2. 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

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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)

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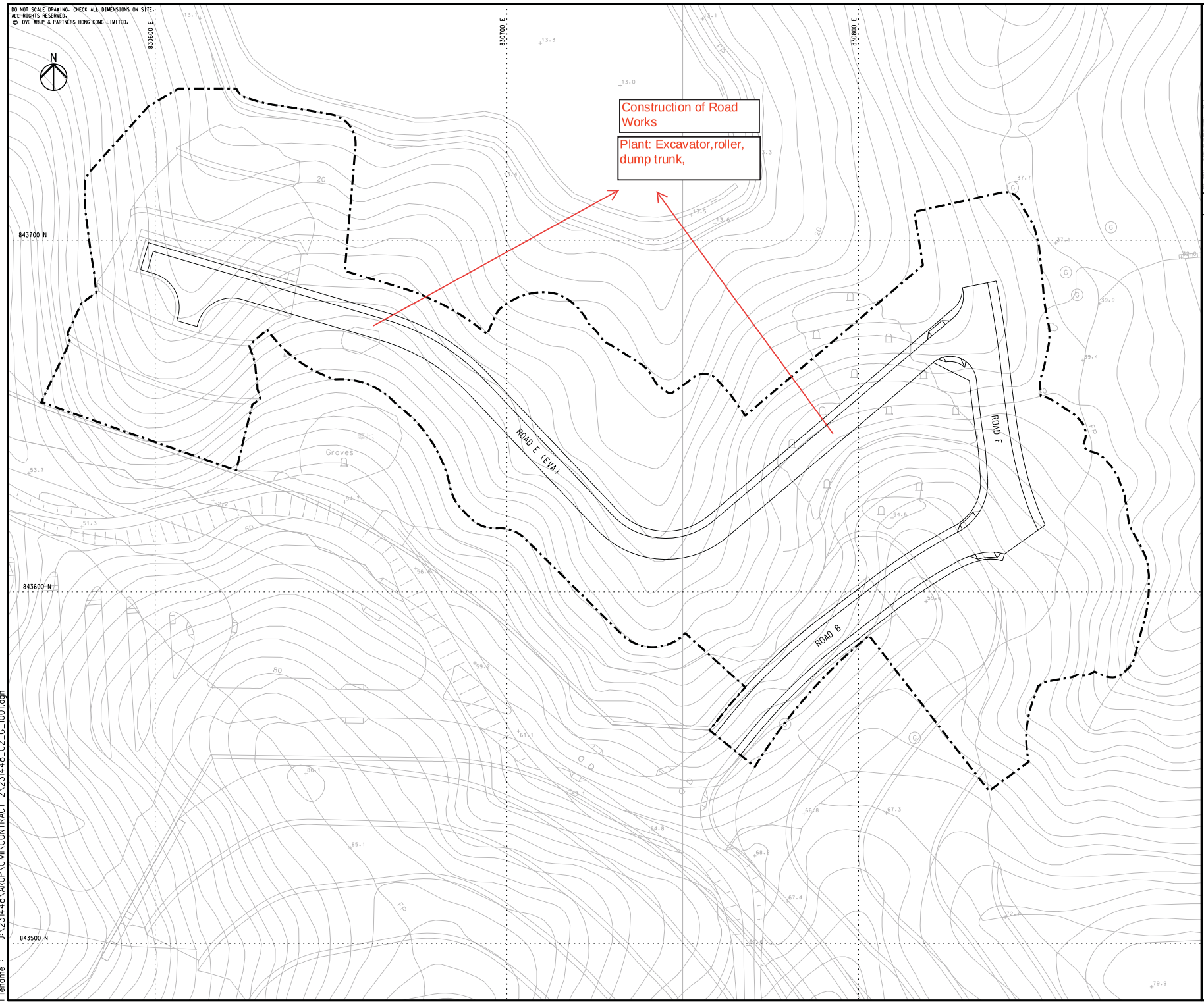

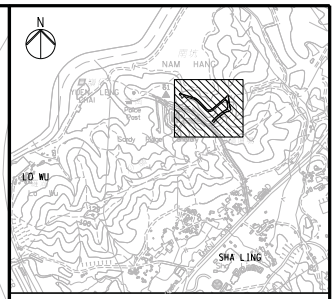

KEY PLAN

LEGEND:

SITE BOUNDARY

Rev	Description	By	Date
-	TENDER DRAWING	AW	11/17

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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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