



**JOB No.: TCS01216/21**

**WSD Contract No.: 3/WSD/20 -  
Reclaimed Water Supply to Sheung Shui and Fanling**

**MONTHLY ENVIRONMENTAL MONITORING & AUDIT  
REPORT (No.10) – SEPTEMBER 2022**

**PREPARED FOR  
WATER SUPPLIES DEPARTMENT**

**Quality Index**

<b>Date</b>	<b>Reference No.</b>	<b>Prepared By</b>	<b>Approved By</b>
12 October 2022	TCS01216/21/600/R0051v2	 Martin Li Environmental Consultant	 TW Tam Environmental Team Leader

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1	11 October 2022	First Submission
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Date: 13<sup>th</sup> October 2022

Project Manager  
Water Supplies Department  
Immigration Tower, 7 Gloucester Road,  
Wan Chai, Hong Kong  
Attn: Mr. Freeman Kei

Dear Sir,

**Agreement No. CE67/2017(W5)**

**Reclaimed Water Supply to Sheung Shi and Fanling – Investigation, Design and Construction**

**Independent Environmental Checker (IEC) Services for**

**Shek Wu Hui Water Reclamation Plant under Contract No. 3/WSD/20**

**Monthly EM&A Monitoring Report for September 2022**

We refer to the monthly EM&A Report for September 2022 for WSD Contract No.: 3/WSD/20 – Reclaimed Water Supply to Sheung Shui and Fanling certified by the Environmental Team Leader on 7<sup>th</sup> September 2022. Please note we have no adverse comments on the captioned submission. The captioned submission is hereby verified in accordance with the requirement stipulated in Condition 3.4 of Environmental Permit No. FEP-01/470/2013.

Should you have any query, please feel free to contact the undersigned at 6113 2368.

Yours Sincerely,

Vega Wong

Independent Environmental Checker

c.c.

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## EXECUTIVE SUMMARY

- ES.01 Water Supplies Department (WSD) is the Project Proponent and the Permit Holder of **Reclaimed Water Supply to Sheung Shui and Fanling** (hereinafter referred as “the Contract Works”), which is a Designated Project to be implemented under Further Environmental Permit number FEP-01/470/2013 (hereinafter referred as “the FEP-01/470/2013” or “the FEP”).
- ES.02 In according with the Updated EM&A Manual stipulation and the location of Contract Works, only construction noise monitoring and waterbird of ecological monitoring are required during the construction phase of the Contract Works.
- ES.03 As part of the EM&A programme, Baseline Monitoring Report which determined Action and Limit Levels (A/L Levels) based on the baseline data, has been verified by Independent Environmental Checker (IEC) and submitted to EPD endorsement on **24 November 2021**. Also, construction activities under the Contract Works were commenced on **7 December 2021**.
- ES.04 This is the **10<sup>th</sup>** monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from **1** to **30 September 2022** (hereinafter ‘the Reporting Period’).

## ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

- ES.06 Environmental monitoring activities under the EM&A programme in the Reporting Period are summarized in the following table.

**Table ES-1 Environmental monitoring activities in the Reporting Period**

Environmental Aspect	Environmental Monitoring Parameters / Inspection	Total Occasions during Reporting Period
Construction Noise	$L_{eq(30min)}$ Daytime	4
Ecology	Waterbirds	4
Site Inspection / Audit	ET, the Contractor and RE joint site Environmental Inspection	5

## BREACH OF ACTION AND LIMIT (A/L) LEVELS

- ES.07 In the Reporting Period, no construction noise limit level exceedance construction noise was recorded and no noise complaint (i.e. Action Level) was received. No action and limit level exceedance for waterbirds survey was recorded in the Reporting Period. No Notifications of Exceedances (NOEs) was issued to the Resident Engineer (RE), IEC and the Main Contractor. The statistics of environmental exceedance, NOE issued and investigation of exceedance are summarized in the following table.

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

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	0	0	0
Ecology	Waterbirds Abundance	0	0	0	0	0

## ENVIRONMENTAL COMPLAINT

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

**Table ES-3 Environmental Complaint Summaries in the Reporting Month**

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 30 September 2022	0	0	NA

ES.09 In addition, no complaint received and emergency events relating to violation of environmental legislation for illegal dumping and landfilling were received.

#### NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.10 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 Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 30 September 2022	0	0	NA

**Table ES-5 Environmental Prosecution Summaries in the Reporting Month**

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 30 September 2022	0	0	NA

#### REPORTING CHANGE

ES.11 No report change in the reporting period.

#### SITE INSPECTION

ES.12 Weekly site inspections to evaluate the site environmental performance have been carried out by the RE, ET and the Main Contractor on *1, 8, 15, 23 and 27 September 2022*. No non-compliance was noted during the site inspection.

ES.13 No site visit was undertaken by EPD and AFCD within the Reporting Period. IEC inspection was conducted on 28 September 2022.

#### FUTURE KEY ISSUES

ES.14 Rebar fixing and formwork erection will be the major construction work in the coming month. Noise mitigation measures such as using soft face hammer for hammering work and erect barrier for wood/steel bar cutting machines were recommended to reduce noise impact.

ES.15 In addition, concreting work for reinforced concrete structure of ReWPS and HCF would also be conducted in the coming month. The Contractor should pay attention to potential water quality impact from concreting works and implement measure to collect spilt cement/concrete washings during concreting works.

ES.16 As the coming month will be dry season, the Contractor was general reminded to paid attention to air quality mitigation measures such as regularly water at dry haul road and cover any stockpile on site when not in use to reduce dust generation.

ES.17 Details of the future issues in the coming month are described in Section 9.4.



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## 1. INTRODUCTION

### 1.1 BACKGROUND

- 1.1.1 Water Supplies Department (WSD) is the Project Proponent of Utilization of Treated Sewage Effluent (TSE) from Shek Wu Hui Sewage Treatment Works. On 30<sup>th</sup> July 2021, China Geo-Engineering Corporation (hereinafter named as “the Main-Contractor”) was awarded WSD Contract Works 3/WSD/20 - Reclaimed Water Supply to Sheung Shui and Fanling (hereinafter referred as “the Contract Works”).
- 1.1.2 The reclaimed water supply to Sheung Shui and Fanling (SSF) comprises a Shek Wu Hui Water Reclamation Plant (SWHWRP), part of pumping water mains to Table Hill Reclaimed Water Service Reservoir (TBHRWSR), and Kwu Tung North (KTN) New Development Area (NDA) and distribution water mains to SSF area.
- 1.1.3 The SWHWRP, which comprises Hypo-Chlorination Facilities (HCF) and Reclaimed Water Pumping Station (ReWPS), will be located at a long-stripped area between Ng Tung River and Sheung Shui Slaughter House at the northwest of the Shek Wu Hui Sewage Treatment Works (SWHSTW).
- 1.1.4 The HCF, which consists of a hypo-chlorination dosing plant, a chlorine contact tank, dye dosing system, water refilling station, other post-treatment facilities and storage areas for chemicals, would produce reclaimed water by further treatment of the treated sewage effluent (TSE) pumped from the discharge outlet of the SWHSTW. The treatment capacity of the SWHWRP will be 73,000m<sup>3</sup>/day.
- 1.1.5 The Reclaimed Water P/S, which will be located at the northwest of the HCF, will receive reclaimed water by gravity from the HCF and deliver to the TBHRWSR serving SSF areas, Kwu Tung North Flushing Water Service Reservoir (KTN FLWSR) serving KTN NDA and Fanling North Flushing Water Service Reservoir (FLN FLWSR) serving Fanling North (FLN) NDA.
- 1.1.6 This Work Contract mainly comprise construction of Shek Wu Hui Water Reclamation Plant and laying of the associated water main to produce reclaimed water for supply to the Northeast New Territories areas for non-potable used. It is estimated that about 22 million cubic metres of fresh water can be saved each year ultimately.
- 1.1.7 The construction of Shek Wu Hui Water Reclamation Plant under the Work Contract is a Designated Project to be implemented under Further Environmental Permit number FEP-01/470/2013 (hereinafter referred as “the FEP-01/470/2013” or “the FEP”). Location of Shek Wu Hui Water Reclamation Plant is shown in [Appendix A](#).
- 1.1.8 The major work of the Work Contract under FEP included:
- Civil engineering construction works, including structures, foundations and earthworks for the SWHWRP and ancillary buildings;
  - Electrical and mechanical (E&M), building services, fire services installations, and treatment process system engineering work;
  - Other associated systems and facilities for the SWHWRP.
- 1.1.9 Pursuant to the FEP stipulation, the Main Contractor has commissioned Action-United Environmental Services & Consulting (hereinafter referred as “AUES”) as Environmental Team (hereinafter referred as “ET”) perform relevant EM&A programme and as well as the associated duties.
- 1.1.10 As part of the EM&A programme, Baseline Monitoring Report which determined Action and Limit Levels (A/L Levels) based on the baseline data, has been verified by Independent Environmental Checker (IEC) and submitted to EPD endorsement on **24 November 2021**. Also, construction activities of the Contract were commencement on **7 December 2021**.

- 1.1.11 This is **10<sup>th</sup>** monthly EM&A report to presenting the monitoring results and inspection findings from **1** to **30 September 2022** of the Reporting Period.

## **1.2 REPORT STRUCTURE**

- 1.2.1 The report was structured into the following sections:-

<b>Section 1</b>	<i>Introduction</i>
<b>Section 2</b>	<i>Project Organization and Construction Progress</i>
<b>Section 3</b>	<i>Summary of Impact Monitoring Requirements</i>
<b>Section 4</b>	<i>Construction Noise Monitoring</i>
<b>Section 5</b>	<i>Ecology Waterbirds Monitoring</i>
<b>Section 6</b>	<i>Waste Management</i>
<b>Section 7</b>	<i>Site Inspections</i>
<b>Section 8</b>	<i>Environmental Complaints and Non-Compliance</i>
<b>Section 9</b>	<i>Implementation Status of Mitigation Measures</i>
<b>Section 10</b>	<i>Conclusions and Recommendations</i>

**2. PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS****2.1 PROJECT ORGANIZATION**

- 2.1.1 The project organization is shown in [Appendix B](#). The roles and responsibilities of the various parties involved in the EM&A process and the organizational structure of the organizations responsible for implementing the EM&A programme are outlined below.

Water Supplies Department (WSD)

- 2.1.2 WSD is the Project Proponent and the Permit Holder of the EP of the development of the Project and will assume overall responsibility for the project. An Independent Environmental Checker (IEC) shall be employed by WSD to audit the results of the EM&A works carried out by the ET.

Environmental Protection Department (EPD)

- 2.1.3 EPD is the statutory enforcement body for environmental protection matters in Hong Kong.

Engineer or Engineers Representative (ER)

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

- Supervise the Contractor's activities and ensure that the requirements in the Contract Works Specific EM&A Manual are fully complied with;
- Inform the Contractor when action is required to reduce impacts in accordance with the Event and Action Plans;
- Employ an IEC to audit the results of the EM&A works carried out by the ET; and
- Comply with the agreed Event Contingency Plan in the event of any exceedance.

The Main Contractor

- 2.1.5 The Main Contractor is responsible perform construction works and for ensuring that the works are undertaken compliance with the specification and contract requirements. The duties and responsibilities of the Main Contractor with respect to EM&A are:

- Employ an Environmental Team (ET) to undertake monitoring, laboratory analysis and reporting of environmental monitoring and audit;
- Provide assistance to ET in carrying out monitoring and auditing;
- Submit proposals on mitigation measures in case of exceedances of Action and Limit levels in accordance with the Event and Action Plans;
- Implement measures to reduce impact where Action and Limit levels are exceeded; and
- Adhere to the agreed procedures for carrying out compliant investigation.

Environmental Team (ET)

- 2.1.6 The ET is responsible perform implementation EM&A programmes of the Contract Works as stipulated in the Updated EM&A Manual ensure the works are fully compliance with environmental regulations. The duties and responsibilities of the ET with respect to EM&A are:

- Set up all the required environmental monitoring stations;
- Monitor various environmental parameters as required in the EM&A Manual;
- Analyze the EM&A data and review the success of EM&A programme to cost effectively confirm the adequacy of mitigation measures implemented and the validity of the EIA predictions and to identify any adverse environmental impacts arising;
- Carry out site inspection to investigate and audit the Contractors' site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and take proactive actions to pre-empt problems;
- Audit and prepare audit reports on the environmental monitoring data and site environmental conditions;
- Report on the EM&A results to the IEC, Contractor, the ER and EPD or its delegated representative;
- Recommend suitable mitigation measures to the Contractor in the case of exceedance of

- Action and Limit levels in accordance with the Event and Action Plans;
- Undertake regular and ad-hoc on-site audits / inspections and report to the Contractor and the ER of any potential non-compliance; and
- Follow up and close out non-compliance actions.

#### Independent Environmental Checker (IEC)

2.1.7 The duties and responsibilities of IEC with respect to EM&A are:

- Review the EM&A works performed by the ET (at not less than monthly intervals);
- Audit the monitoring activities and results (at not less than monthly intervals);
- Report the audit results to the ER and EPD in parallel;
- Review the EM&A reports (monthly summary reports) submitted by the ET;
- Review the proposal on mitigation measures submitted by the Contractor in accordance with the Event and Action Plans;
- Check the mitigation measures submitted by the Contractor in accordance with the Event and Action Plans;
- Check the mitigation measures that have been recommended in the EIA and this Manual, and ensure they are properly implemented in a timely manner, when necessary;
- Report the findings of site inspections and other environmental performance reviews to ER and EPD;
- Coordinate the monitoring and auditing works for all the on-going contracts in the area in order to identify possible sources / causes of exceedances and recommend suitable remedial actions where appropriate; and
- Coordinate the assessment and response to complaints / enquires from locals, green groups, district councils or the public at large.

## 2.2 CONSTRUCTION PROGRESS

2.2.1 In the Reporting Period, the construction activities of the Contract Works under FEP are listed in below. Moreover, the master construction program and site overview photo in the reporting period are enclosed in [Appendix C](#).

- Construction of reinforced concrete structure of ReWPS and HCF
- Rebar fixing work at ReWPS and HCF
- Formwork erection work at ReWPS and HCF
- Scaffolding work at ReWPS and HCF

## 2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.3.1 To according with the FEP stipulation, the required documents has submitted to EPD for retention as listed below:

- Project Location Plans;
- Updated Environmental Monitoring and Audit Manual of Project Specific (TCS01176/21/600/R0012v2); and
- Baseline Monitoring Report (TCS01216/21/600/R0017v3) for the Project.

2.3.2 Summary of the relevant permits, licenses, and/or notifications on environmental protection for the Project is presented in **Table 2-3-1**.

**Table 2-3-1 Status of Environmental Licenses and Permits**

Item	Description	Licence/Permit Status		
		Ref. no.	Effective Date	Expiry Date
1	Air Pollution Control (Construction Dust) Regulation	Notification was made on 3 Aug 2021	3 Aug 2021	Till the Contract ends
2	Waste Disposal Regulation – Billing Account for Disposal of Construction Waste	Account No.: 7041397	8 Aug 2021	Till the Contract ends
3	Chemical Waste Producer Registration	Application was made on 3 Aug 2021	3 Aug 2021	Till the Contract ends
4	Water Pollution Control	Discharge Licence No.:	17 Nov 2021	30 Nov 2026

Item	Description	Licence/Permit Status		
		Ref. no.	Effective Date	Expiry Date
	Ordinance – Discharge Licence	WT00039707-2021		
5	Construction Noise Permit	CNP No. GW-RN0536-22	27 Jun 2022	26 Sep 2022
		CNP No. GW-RN0880-22	27 Sept 2022	26 Jan 2023



### 3. SUMMARY OF IMPACT MONITORING REQUIREMENTS

#### 3.1 GENERAL

- 3.1.1 According to the Updated EM&A Manual and the location of the Contract Works, only construction noise monitoring and waterbirds ecological of environmental monitoring are related the Contract Works during the construction phase. Details requirement of noise and waterbirds ecological impact monitoring are presented sub-sections as below.

#### 3.2 REQUIREMENT OF CONSTRUCTION NOISE MONITORING

- 3.2.1 One set of  $L_{eq(30min)}$  as 6 consecutive  $L_{eq(5min)}$  between 0700-1900 hours on normal weekdays and once every week during course of works. If construction work necessary to carry out at other time periods, i.e. restricted time period (19:00 to 07:00 the next morning and whole day on public holidays) (hereinafter referred as “the restricted hours”),  $L_{eq(5min)}$  measurement will be carried out in accordance with the CNP requirements. Supplementary information for data auditing, statistical results such as  $L_{10}$  and  $L_{90}$  shall also be obtained for reference.

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

#### 3.3 LOCATION OF CONSTRUCTION NOISE IMPACT MONITORING

- 3.3.1 According to the Updated EM&A Manual of CEDD Contract No. NDO 14/2018 - *Advance and First Stage Works of Kwu Tung North and Fanling North New Development Areas*, four noise sensitive receivers are designated on Fanling North New Development Areas for construction noise monitoring.

- 3.3.2 According to the geographic location of proposed Shek Wu Hui Water Reclamation Plant and all the recommended designated construction noise monitoring stations, only the designated noise monitoring station CP-KTN-NMS5 (prior named “CP-NMS7”) shown in [Appendix D](#), is located near the proposed Shek Wu Hui Water Reclamation Plant within 300m (distance about 110m). Therefore, the designated noise monitoring station CP-KTN-NMS5 is recommended for the Contract Works to undertake construction noise monitoring. If the recommended noise monitoring location CP-KTN-NMS5 not available, the ET shall propose alternative monitoring locations/additional monitoring locations and seek approval from the Supervisor of the proposal. When alternative/new monitoring location is proposed, the monitoring location shall be chosen based on the following criteria:

- (i) at locations close to the major site activities which are likely to have noise impacts;
- (ii) close to the noise sensitive receivers; and
- (iii) for monitoring locations located in the vicinity of the sensitive receivers, care shall be taken to cause minimal disturbance to the occupants during monitoring.

- 3.3.3 The construction noise monitoring station shall normally be at a point 1 m from the exterior of the sensitive receivers building façade and be a position 1.2m above the ground. If there is problem with access to the normal monitoring position, an alternative position may be chosen, and a correction to the measurements shall be made to the free field measurements. The ET shall agree with the Supervisor on the monitoring station that is chosen for impact monitoring.

#### 3.4 ACTION AND LIMIT LEVEL FOR CONSTRUCTION NOISE

- 3.4.1 The Action and Limit levels for construction noise are defined in **Table 3-4-1**. Should non-compliance of the criteria occur, action in accordance with the Action Plan which shown in Section 4 of this report, shall be carried out.



**Table 3-4-1 Action and Limit Levels for Construction Noise**

Monitoring Location	Action Level	Limit Level in dB(A)
	Time Period: 0700-1900 hours on normal weekdays	
CP-KTN-NMS5	When one or more documented complaints are received	75 dB(A) <sup>Note 1</sup>

*Note 1: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the NCA have to be followed.*

### 3.5 NOISE MONITORING METHODOLOGY

#### Monitoring Equipment

- 3.5.1 Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications was used for carrying out the noise monitoring. Noise equipment used for impact monitoring is listed in **Table 3-5-1**.

**Table 3-5-1 Equipment of Noise Impact Monitoring**

Equipment	Model
Integrating Sound Level Meter	Rion NL – 52
Calibrator	Rion NC – 74

Remark: Sound level meter IEC 60651:1979 (Type 1) was replaced by 60672 (Type 1) in 2002 (Ref: <https://webstore.iec.ch/publication/17086>)

- 3.5.2 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme at yearly basis. The valid calibration certificates of the monitoring equipment are shown in **Appendix E**.

### 3.6 MONITORING PROCEDURE

- 3.6.1 All noise measurements were performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (Leq). Leq<sub>(30min)</sub> in six consecutive Leq<sub>(5min)</sub> measurements was used as the monitoring parameter for the time period between 07:00-19:00 hours during the baseline monitoring.
- 3.6.2 In general, the sound level meter would be mounted on a tripod at a height of 1.2 m and placed at the assessment point and oriented such that the microphone was pointed to the site with the microphone facing perpendicular to the line of sight. The windshield would be fitted for all measurement. Where a measurement was to be carried out at a building, the assessment point would normally be at a position 1 m from the exterior of the building façade. Where a measurement was to be made for noise being received at a place other than a building, the assessment point would be at a position 1.2 m above the ground in a free-field situation, i.e. at least 3.5 m away from reflective surfaces such as adjacent buildings or walls.
- 3.6.3 Immediately prior to and following each noise measurement the accuracy of the sound level meter was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements would be accepted as valid only if the calibration level from before and after the noise measurement agrees to within 1.0 dB.
- 3.6.4 Noise measurements would not be made in fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. The wind speed would be checked with a portable wind speed meter capable of measuring the wind speed in m/s.

### 3.7 DATA MANAGEMENT AND DATA QA/QC CONTROL

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

### 3.8 REQUIREMENT OF WATERBIRDS ECOLOGICAL IMPACT MONITORING

3.8.1 Where development under the NDAs project is undertaken within 200m (the maximum distance at which it is predicted there may be some disturbance, and hence a reduction in numbers, of large waterbirds) of the Ng Tung, Sheung Yue and Shek Sheung Rivers and Long Valley the monitoring protocol detailed in the updated EM&A Manual Table 12.1 should be followed. A transect should be undertaken throughout the sections of the rivers where NDA construction activities are proposed; as the sensitive receivers (large waterbirds) are easily visible, the transect route needs only follow one bank of the rivers. The transect route should remain the same during the different phases in order to ensure that data are comparable. Monitoring of large waterbirds should be conducted in pre-construction, construction and operational phases of the concerned development.

3.8.2 The proposed Shek Wu Hui Water Reclamation Plant location is located less than 200m to Ng Tung River, Sheung Yue River and Shek Sheung River, waterbirds ecological monitoring included pre-construction (i.e. baseline), construction (i.e. impact) and post-construction (i.e. operating) should be requires. The detailed monitoring protocol is listed in *Table 3-8-1*.

**Table 3-8-1 Monitoring of Measures to Minimize Disturbance to Waterbirds on the Ng Tung, Sheung Yue and Shek Sheung Rivers**

Phase	Methodology
Pre-construction (baseline)	Weekly transect at both high and low tides to identify and enumerate all bird species utilising the river channels for 12 months prior to the commencement of construction.
Construction	Weekly transect at both high and low tides to identify and enumerate all bird species utilising the river channels and identify any sources of actual or potential disturbance to birds due to construction activities throughout the construction period.
Post-construction	Weekly transect at both high and low tides to identify and enumerate all bird species utilising the river channels and identify any sources of actual or potential disturbance to birds due to operational activities for 12 months following the completion of the construction period.

3.8.3 Waterbirds ecological baseline monitoring at Ng Tung River, Sheung Yue River and Shek Sheung River was conducted by DSD between *December 2017* and *June 2019* (total 19 months baseline monitoring), in compliance with the Updated EM&A Manual. Thus, the action and limit levels and responses to evidence of disturbance to waterbirds using in Ng Tung, Sheung Yue and Shek Sheung Rivers will be made reference during construction phase of the Project.

### 3.9 MONITORING METHODOLOGY FOR WATERBIRDS ECOLOGICAL IMPACT MONITORING

3.9.1 Three transects and seven point count locations were selected at the Ng Tung, Sheung Yue and Shek Sheung River. These locations are shown in Appendix L and summarized in *Table 3-9-1*.

**Table 3-9-1 Ecological Monitoring Stations**

Monitoring Stations	Descriptions	Influenced by Tidal Action
Transect T1	Along Ng Tung River	No
Transect T2		
Point Count Location P1		
Point Count Location P2		
Point Count Location P3		
Point Count Location P4		
Point Count Location P5	At Shek Sheung River (Low-flow Channel)	No
Transect T3	Along Shek Sheung River & Sheung Yue River	Yes
Point Count Location P6	At Shek Sheung River	Yes
Point Count Location P7	At Intersection between Sheung Yue and Shek Sheung River	Yes

- 3.9.2 Surveys will be conducted on a weekly basis at both high and low tides (it is considered high tide when tidal levels are above 1.5m and low tide when tidal level are below 1.5m at Tsim Bei Tsui Station).
- 3.9.3 All avifauna species that were seen or heard would be identified and quantified along transects and at point count locations. Survey data would be recorded continuously by the surveyor as they walk along the transects, while survey data of each point count location would be collected for 5-minutes after surveyor reaches the designated point count location.
- 3.9.4 Noticeable behaviours such as breeding, nesting, roosting, feeding and presences of recently fledged juveniles were recorded and reported. In the case which such behaviours were observed for species of conservation importance, the Resident Engineer (RE), the Contractor and the Independent Environmental Checker (IEC) would be immediately notified after the survey such that the Contractor could review the current construction programme and minimize disturbances due to construction activities.

### 3.10 EVENT ACTION PLAN

#### Noise

- 3.10.1 Should non-compliance of the construction noise criteria occur, action in accordance with the Action Plan in **Table 3-10-1** shall be carried out.

**Table 3-10-1 Event and Action Plan for Construction Noise**

Event	Action			
	ET	IEC	ER	Contractor
<b>Action Level Exceedance</b>	1. Notify the 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 monitoring data submitted by the ET; 2. Review the construction methods and proposed remedial measures by the Contractor, and advise the ET and ER if the proposed remedial measures would be sufficient; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify the Contractor; 3. Require the Contractor to propose remedial measures for the analyzed noise problem; 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to the ER and IEC and copy to the ET; 2. Implement noise mitigation proposals.
<b>Limit Level Exceedance</b>	1. Identify sources. 2. Inform IEC, ER, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase the monitoring frequency; 5. Carry out analysis of the Contractor's working procedures with the ER and Contractor to determine possible mitigations to be implemented; 6. Inform IEC, ER, EPD and Contractor the causes and	1. Discuss amongst the ER, ET and Contractor on the potential remedial actions; 2. Review the Contractor's remedial action whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analyzed noise problems; 4. Ensure remedial measures are properly implemented; 5. If exceedance continues,	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial action to the ER and IEC and copy to the ET within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit

Event	Action			
	ET	IEC	ER	Contractor
	actions taken for the exceedances; 7. Assess the effectiveness of the Contractor's remedial action with the ER and keep the IEC informed of the results; 8. If exceedance stops, cease additional monitoring.		consider what portion of work is responsible and instruct the Contractor to stop that portion of works until the exceedance is abated.	proposals if problems still not under control; stop the relevant portion of works as determined by the ER until the exceedance is abated.

### Waterbird of Ecological

- 3.10.2 Should any exceedance encountered during construction phase, action in accordance with the Action Plan listed in **Table 3-10-2** shall be carried out.

**Table 3-10-2 Event and Action Plan of Waterbirds of Ecological**

Action Level	Response	Limit Level	Response
<b>Construction Phase</b>			
Decline in numbers of all waterbird species relative to numbers during Baseline Monitoring such that the Action Level response is triggered.	Investigate cause and if cause identified as related to NDAs project instigate remedial action to remove or reduce source of disturbance.	Decline in numbers of all waterbird species relative to numbers during Baseline Monitoring such that the Limit Level response is triggered.	Investigate cause and if caused identified as related to NDAs project instigate remedial action. Review and adjust LVNP management measures to improve conditions for affected species.
Decline in numbers of any one waterbird species occurring in significant numbers* during Baseline Monitoring such that the Action Level response is triggered.	Investigate cause and if cause identified as related to NDAs project instigate remedial action to remove or reduce source of disturbance.	Decline in numbers of any one waterbird species occurring in significant numbers* during Baseline Monitoring such that the Limit Level response is triggered.	Investigate cause and if caused identified as related to NDAs project instigate remedial action. Review and adjust LVNP management measures to improve conditions for affected species.

(\*) *Waterbird numbers refer to combined numbers using the channels*

**4. CONSTRUCTION NOISE MONITORING****4.1 GENERAL**

4.1.1 The noise monitoring schedule is presented in [Appendix F](#) and the monitoring results are presented in the following sections.

**4.2 RESULTS OF NOISE MONITORING**

4.2.1 In the Reporting Period, a total of **4** occasions noise monitoring were carried out at the designated location CP-KTN-NMS5. The sound level meter was set in free-field situation, and therefore, façade correction (+3dB) is added according to acoustical principles and EPD guidelines. The noise monitoring results at the designated locations are summarized in **Tables 4-2-1**. The detailed noise monitoring data is presented in [Appendix G](#) and the relevant graphical plot shown in [Appendix H](#).

**Table 4-2-1 Summaries of Noise Monitoring Results of CP-KTN-NMS5**

Date	Start Time	L <sub>Aeq30min</sub> (dB(A))
7-Sep-22	13:12	60
15-Sep-22	9:14	57
21-Sep-22	11:13	59
28-Sep-22	15:01	59
<b>Limit Level</b>		<b>75 dB(A)</b>

*Note: façade correction +3dB has added according to acoustical principles and EPD guidelines*

4.2.2 During construction noise monitoring, no rain was encountered and wind speed is below 5m/s and gusts not exceeding 10m/s.

4.2.3 As shown in **Table 4-2-1**, the noise level measured at the designated monitoring location was below 75dB(A). Furthermore, there were no noise complaints (Action Level exceedance) received by the RE, Contractor, WSD or EPD in the Reporting Period. Therefore, no Action or Limit Level exceedance was triggered and no corrective action was therefore required.

4.2.4 During the reporting period, no construction work was carried out during restricted hours.

**5. ECOLOGY WATERBIRD MONITORING****5.1 GENERAL**

- 5.1.1 Ecological monitoring for waterbirds shall be performed as transects and point count surveys along Ng Tung River, Sheung Yue River and Shek Sheung River in accordance with general surveying practices.
- 5.1.2 The surveying shall be undertaken by a qualified ecologist and he/she shall be a member of the ET. Throughout the construction period, weekly transect shall be conducted at both high and low tides to identify and enumerate all bird species utilising the river channels and identify any sources of actual or potential disturbance to birds due to construction activities.
- 5.1.3 Since occurrence of waterbirds has distinctive seasonal pattern, the construction phase data for all waterbirds and representative waterbirds shall be compared with the baseline data for the respective month and season. Total number of Waterbirds and six representative Waterbird species are used as an indicator of the level disturbance to water birds at each of the survey location. The representatives of waterbirds are listed in *Table 5-1-1*.

**Table 5-1-1 Representative Waterbirds**

Species Name	Common Name	Chinese Name
<i>Egretta garzetta</i>	Little Egret	小白鷺
<i>Ardea alba</i>	Great Egret	大白鷺
<i>Ardea cinerea</i>	Grey Heron	蒼鷺
<i>Ardeola bacchus</i>	Chinese Pond Heron	池鷺
<i>Bubulcus coromandus</i>	Eastern Cattle Egret	牛背鷺
<i>Phalacrocorax carbo</i>	Great Cormorant	普通鸕鶿

**5.2 RESULTS OF WATERBIRDS SURVEY**

- 5.2.1 *Four (4)* occasion of waterbirds survey were conducted in the Reporting Month.
- 5.2.2 Abundance and diversity of total bird species and key waterbirds species in the Reporting Month are summarized in **Table 5-2-1** and **Table 5-2-2**.

**Table 5-2-1 Total Bird Species and Abundance at Point Count Locations in the Reporting Month**

Category	Number of Species	Abundance
All Avifauna	35	583
Waterbirds	12	189

**Table 5-2-2 Abundance of Representative Waterbirds at Point Count Locations in the Reporting Month**

Common Name	Species Name	Chinese Name	Abundance
Chinese Pond Heron	<i>Ardeola bacchus</i>	池鷺	35
Eastern Cattle Egret	<i>Bubulcus coromandus</i>	牛背鷺	19
Grey Heron	<i>Ardea cinerea</i>	蒼鷺	13
Great Egret	<i>Ardea alba</i>	大白鷺	19
Little Egret	<i>Egretta garzetta</i>	小白鷺	46
Great Cormorant	<i>Phalacrocorax carbo</i>	普通鸕鶿	0

- 5.2.3 The result was compared with the baseline data and the number of Little Egrets was found declined. A table showing the waterbirds abundance comparison with baseline data was provided in **Appendix L**. (Appendix C of the waterbirds survey report).

- 5.2.4 As suggested in previous reporting months, the more attractive wetland habitats at Long Valley Nature Park (LVNP) may have caused waterbirds to deprioritize activities within the study area. The hypothesis is supported by the accounts as most of the Little Egrets from the transect count was recorded within LVNP which are excluded from both point count and transect count due to the extent of Study Area. In addition, the tidal influence of the Rivers may restrict the availability of foraging and roosting sites for the waterbirds. This may further encourage the waterbirds utilizing the more attractive habitats in the nearby LVNP.
- 5.2.5 Given that the anthropogenic activities recorded were similar to the previous month and no large instances of disturbance (only use of crane and scaffolding works) caused by construction works of the project were recorded by the surveyor, it is suggested the decline in numbers of Little Egrets are not related to the construction works. No action and limit level exceedance was therefore considered triggered in the Reporting Month.
- 5.2.6 The details of the waterbirds survey for the Reporting Month can be referred to the full waterbirds survey report provided in **Appendix L**.



**6. WASTE MANAGEMENT****6.1 GENERAL WASTE MANAGEMENT**

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

**6.2 RECORDS OF WASTE QUANTITIES**

- 6.2.1 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.

- 6.2.2 The quantities of waste for disposal in this Reporting Period are summarized in *Tables 6-2-1* and *6-2-2* and the Monthly Summary Waste Flow Table is shown in *Appendix I*. Whenever possible, materials were reused on-site as far as practicable.

**Table 6-2-1 Summary of Quantities of Inert C&D Materials**

Type of Waste	Quantity	Disposal Location
C&D Materials (Inert) (in '000m <sup>3</sup> )	0.1983	-
Reused in this Contract (Inert) (in '000 m <sup>3</sup> )	0.0144	-
Reused in other Contracts/ Projects (Inert) (in '000 m <sup>3</sup> )	0	-
Disposal as Public Fill (Inert) (in '000 m <sup>3</sup> )	0.1839	TM38

**Table 6-2-2 Summary of Quantities of C&D Wastes**

Type of Waste	Quantity	Disposal Location
Recycled Metal ('000kg)	0	-
Recycled Paper / Cardboard Packing ('000kg)	0	-
Recycled Plastic ('000kg)	0	-
Chemical Wastes ('000kg)	0	-
General Refuses ('000m <sup>3</sup> )	0.0154	SENT



**7. SITE INSPECTION****7.1 REQUIREMENTS**

- 7.1.1 According to the approved Updated EM&A Manual, the environmental site inspection shall be formulation by ET Leader. Weekly environmental site inspections should carry out to confirm the environmental performance.

**7.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH**

- 7.2.1 In the Reporting Month, weekly regular site inspection by the RE, the Main Contractor and ET was carried out on **1, 8, 15, 23** and **27 September 2022** to evaluate site environmental performance of the Contract Works. During the site inspections, no non-compliance was noted.

- 7.2.2 The findings/deficiencies of the Contract Works observed that during the weekly site inspection are listed in **Table 7-2-1**.

**Table 7-2-1 Site Observations**

<b>Date</b>	<b>Findings / Deficiencies</b>	<b>Follow-Up Status</b>
1 September 2022	<ul style="list-style-type: none"> <li>No adverse environmental issue was observed during site inspection.</li> </ul>	NA
8 September 2022	<ul style="list-style-type: none"> <li>The Contractor should dispose the construction waste on ground regularly.</li> <li>The Contractor should place oil drum inside drip tray to avoid land contamination.</li> </ul>	<p>The construction waste was dispose regularly.</p> <p>The oil drum was removed from site.</p>
15 September 2022	<ul style="list-style-type: none"> <li>Stockpile should be covered properly with tarpaulin sheet to reduce dust generation.</li> </ul>	Stockpile was covered with tarpaulin sheets.
23 September 2022	<ul style="list-style-type: none"> <li>No adverse environmental issue was observed during site inspection.</li> </ul>	NA
27 September 2022	<ul style="list-style-type: none"> <li>The Contractor was advised to dispose the accumulated construction waste regularly.</li> </ul>	Accumulated construction waste was disposed.

**8. ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE****8.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION**

- 8.1.1 For the Contract Works, no environmental complaint, summons and prosecution was received in the Reporting Period. The statistical summary table of environmental complaint is presented in *Tables 8-1-1, 8-1-2 and 8-1-3*.

**Table 8-1-1 Statistical Summary of Environmental Complaints**

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 30 September 2022	0	0	NA

**Table 8-1-2 Statistical Summary of Environmental Summons**

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 30 September 2022	0	0	NA

**Table 8-1-3 Statistical Summary of Environmental Prosecution**

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 – 30 September 2022	0	0	NA

## 9. IMPLEMENTATION STATUS OF MITIGATION MEASURES

### 9.1 GENERAL REQUIREMENTS

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

### 9.2 IMPLEMENTATION STATUS OF THE MITIGATION MEASURES IN THE REPORTING PERIOD

- 9.2.1 The Contract Works shall be implementing the required environmental mitigation measures according to the approved Updated EM&A Manual as subject to the site condition. Environmental mitigation measures implemented by the Main Contractor in this Reporting Month are summarized in **Table 9-1-1**. A site temporary drainage layout plan is shown in [Appendix K](#).

**Table 9-1-1 Environmental Mitigation Measures Implemented in the Reporting Period**

Issues	Environmental Mitigation Measures
Air Quality	<ul style="list-style-type: none"> <li>All vehicles must be washed before leaving the site;</li> <li>Sprayed water during excavation works;</li> <li>Stockpile of dusty material was covered entirely with impervious sheeting or sprayed with water so as to maintain the entire surface wet;</li> <li>Water spraying on haul road and dry site area was provided regularly; and</li> <li>Where a vehicle leaving the works site is carrying a load of dusty materials, the load has covered entirely with clean impervious sheeting;</li> </ul>
Constriction Noise	<ul style="list-style-type: none"> <li>Keep all vehicles/plants in good condition to minimize noise impact;</li> <li>Shut down the plants when not in used;</li> <li>Provided quiet powered mechanical equipment to use onsite;</li> <li>Avoided using multiple vehicles at the same time as far as practicable</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>All the surface runoff are collected to sedimentation pit and tanks for sedimentation prior discharged</li> <li>Sand bag bund was provided along the boundary of the site area near Ng Tung River to divert the surface runoff to sedimentation pit and avoid direct discharge of surface runoff.</li> <li>Standby water pumps were provided on site to pump the runoff water collected at pit to the sedimentation tank for sedimentation.</li> <li>Standby sedimentation tanks were provided on site to ensure sufficient sedimentation capacity.</li> <li>Complied with the requirement under the discharge license.</li> <li>Avoid spilt concrete during concreting works</li> <li>Haul road was hard paved to reduce muddy runoff during rainy days.</li> </ul>
Waste and Chemical Management	<ul style="list-style-type: none"> <li>Disposal of C&amp;D wastes to any designated public filling facility and/or landfill followed a trip ticket system;</li> <li>Debris and refuse generated on-site collected regularly;</li> <li>Oils and fuels were stored in designated areas;</li> <li>Kept the site tidy and clean.</li> </ul>

### 9.3 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH

- 9.3.1 The tentative construction works schedule of the Contract Works under FEP in the coming month are listed below:
- Construction of reinforced concrete structure of ReWPS and HCF
  - Rebar fixing work at ReWPS and HCF
  - Formwork erection work at ReWPS and HCF
  - Scaffolding work at ReWPS and HCF

### 9.4 KEY ISSUES FOR THE COMING MONTH

- 9.4.1 Key issues to be considered in the coming month for the Contract Works under FEP include:

- Ensure the sand bag bund at site boundary near the Ng Tung River is properly maintained to avoid muddy discharge during heavy rain;
- Ensure sufficient capacity of sedimentation pit and tanks for wastewater sedimentation;
- Ensure all surface runoff are diverted to sedimentation pit and tanks properly;
- Sufficient stock of standby pump should be available on site for pumping the runoff water/wastewater to the sedimentation tank.
- Collect spilt cement/concrete washings during concreting works to avoid water quality impact
- Cover the dusty stockpile on site to reduce potential fugitive dust quality impact;
- Spraying water at dry haul road more frequently to reduce dust generation;
- All the vehicles should be properly washed prior leaving the site;
- Erect barrier for wood/steel bar cutting machine;
- Use Quiet powered mechanical equipment (QPME) whenever applicable;
- Minimize the number of plants used at the same time to reduce cumulative noise impact;
- Properly management of general refuse and chemical waste generated on site.

**10. CONCLUSIONS AND RECOMMENDATIONS****10.1 CONCLUSIONS**

- 10.1.1 This is **10<sup>th</sup>** monthly EM&A report presenting the monitoring results and inspection findings for the Reporting Period from **1** to **30 September 2022**.
- 10.1.2 No noise complaint (which is an Action Level exceedance) was received and no construction noise measurement results that exceeded the Limit Level were recorded in the Reporting Period. No NOEs or the associated corrective actions were therefore issued.
- 10.1.3 Four (4) occasions of the weekly waterbirds survey has been taken in the Reporting Period. Although decline in Little Egret were recorded in the Reporting Period, the cause of decline was considered unlikely due to the Project. No action and limit level exceedance was considered triggered in the Reporting Month.
- 10.1.4 No documented complaint, notification of summons or successful prosecution was received by either the RE or WSD or the Main Contractor.
- 10.1.5 Weekly site inspection by the RE, ET and the Main Contractor had carried out on **1, 8, 15, 23** and **27 September 2022**. The mitigation measures implemented was considered satisfactory. No non-compliance observed during the site inspection.

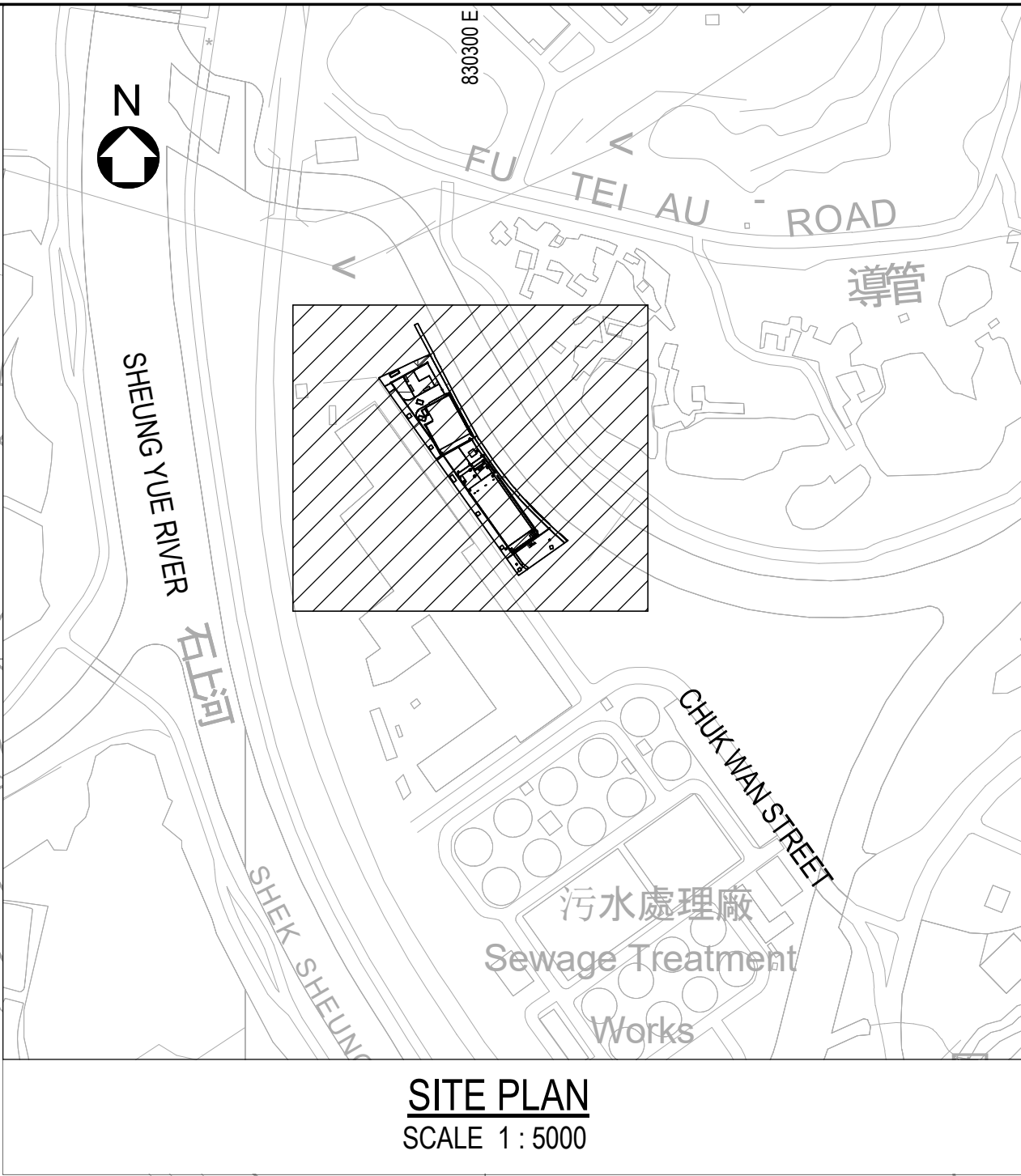
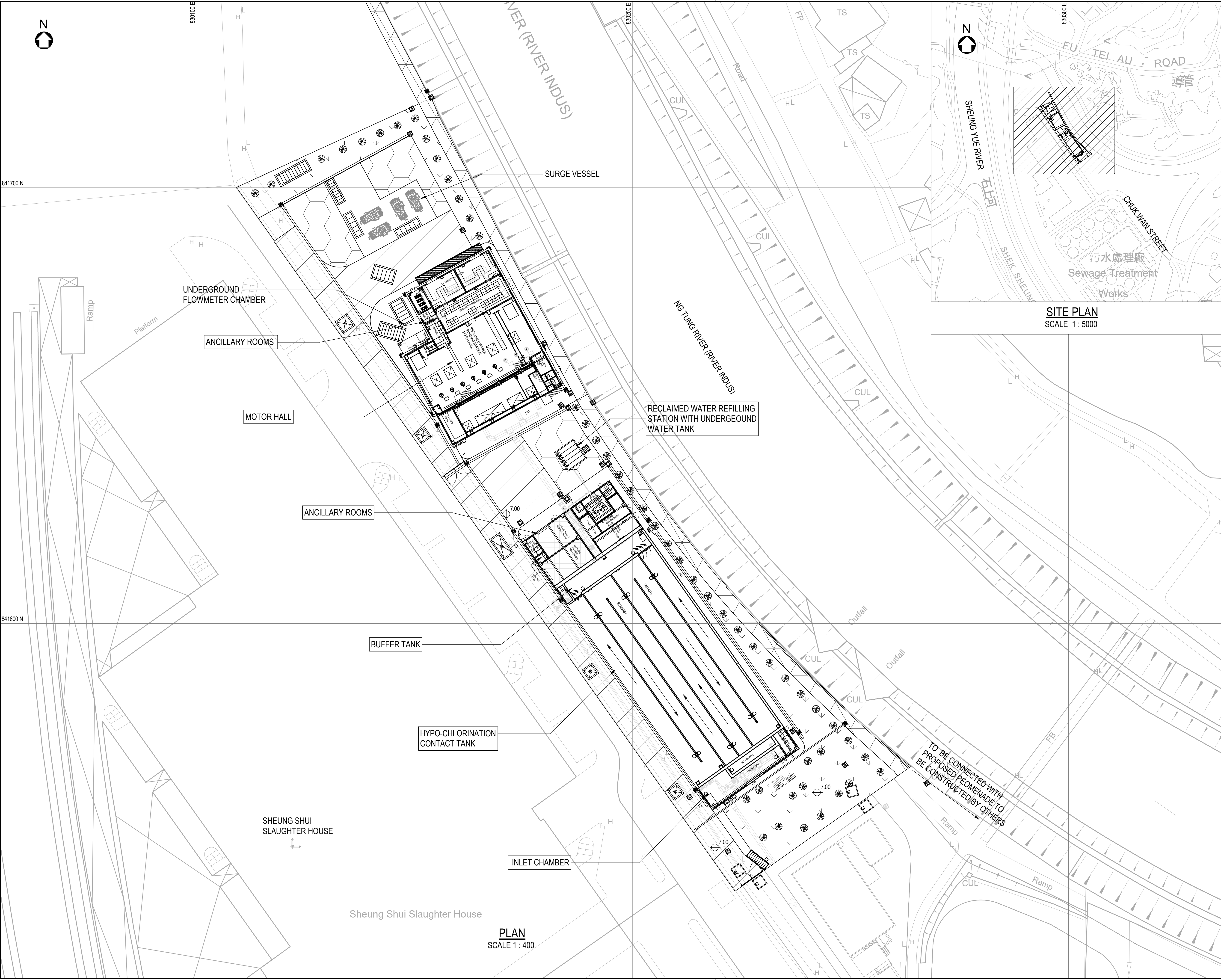
**10.2 RECOMMENDATIONS**

- 10.2.1 Rebar fixing and formwork erection will also be the major construction work in the coming month. Noise mitigation measures such as using soft face hammer for hammering work and erect barrier for wood/steel bar cutting machines were recommended to reduce noise impact.
- 10.2.2 In addition, concreting work for reinforced concrete structure of ReWPS and HCF would also be conducted in the coming month. The Contractor should pay attention to potential water quality impact from concreting works and implement measure to collect spilt cement/concrete washings during concreting works.
- 10.2.3 As the coming month will be dry season, the Contractor was general reminded to paid attention to air quality mitigation measures such as regularly water at dry haul road and cover any stockpile on site when not in use to reduce dust generation.
- 10.2.4 The Contractor was reminded to pay attention to the key issues for the coming month mentioned in Section 9.4.

## **Appendix A**

### **Location of Shek Wu Hui Water Reclamation Plant**







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**NOTES:**

- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
- THE BASE PLAN IS EXTRACTED FROM SURVEY SHEET NOS. 2-SE ADN 3-SW.
- TOP SLABS OF STRUCTURES ARE NOT SHOWN FOR CLARITY.

**LEGEND:**

- SITE BOUNDARY OF SWHWRP
- FENCING
- EVA
- PLANTER GREENING AREA
- GRASSCRETE
- RIVERSIDE PROMENADE
- GROUND LEVEL
- TREE (INDICATIVE)
- F/P FOOTPATH
- MANHOLE/CABLE PIT
- ACCESS GATE

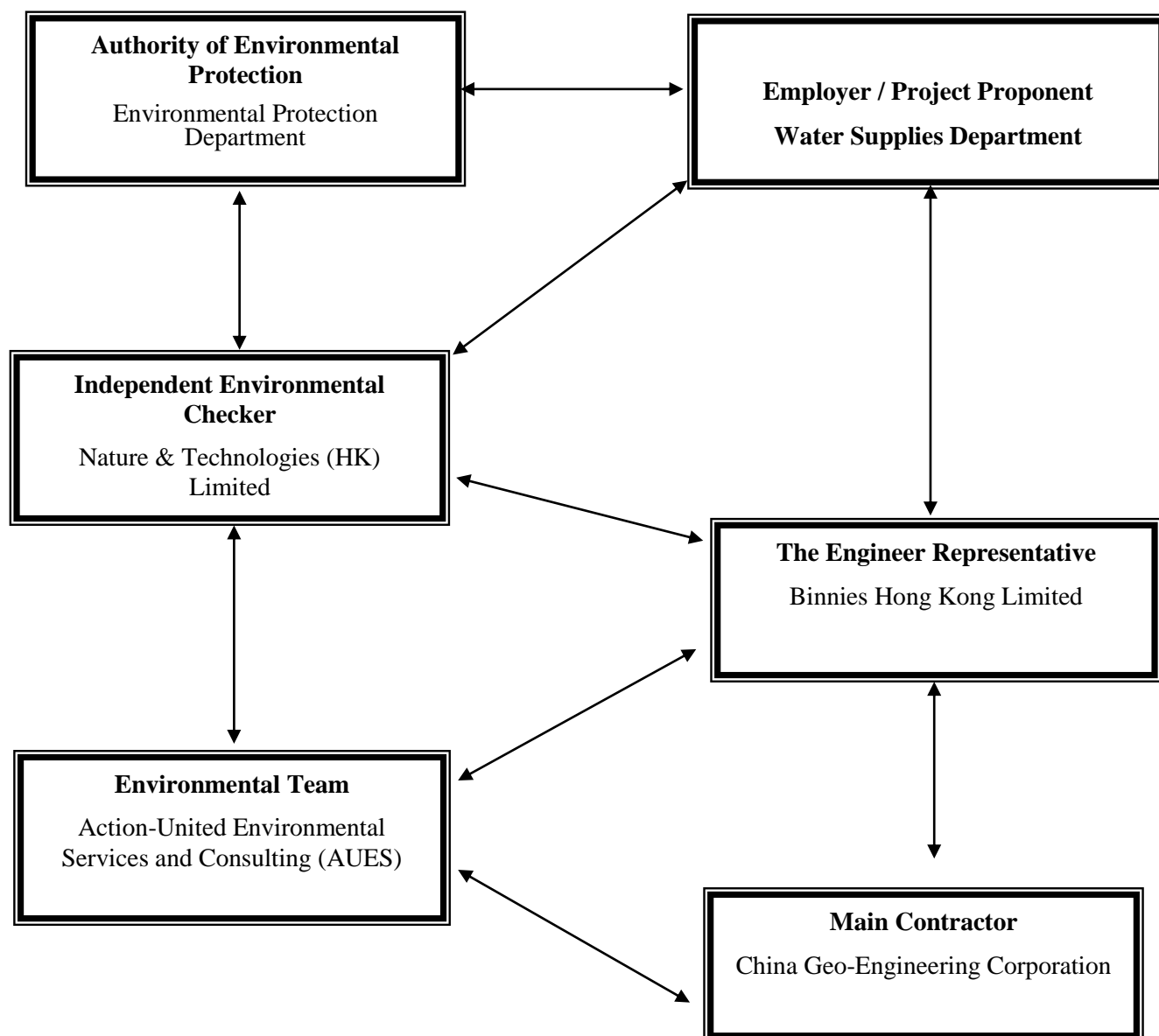
Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial	CWC	GC	SZ
Date	02/21	02/21	02/21
Approved			
Contract No. 3 / WSD / 20			
Contract Title			
RECLAIMED WATER SUPPLY TO SHEUNG SHUI AND FANLING			
Drawing Title			
GENERAL ARRANGEMENT OF SWHWRP - GENERAL PLAN			
Drawing No. 401582/B&V/WRP/GA/101			Revision -
Scale AS SHOWN			
			
 BINNIES HONG KONG LIMITED 賓尼斯工程顧問有限公司			

## **Appendix B**

### **Project Organization**



Project Organization Chart



**Contact Details of Key Personnel for the Project**

Organization	Project Role	Name of Key Staff	Tel No.	Email
WSD	Project Proponent	Tim Wong	2829 5638	tim_cw_wong@wsd.gov.hk
Binnies	Senior Resident Engineer	S.H. Chung	2608 7380	sre.3wsd20@gmail.com
Binnies	Resident Engineer	Chester Chan,	2608 7380	chancw@binnies.com
N&T	Independent Environmental Checker	Vega Wong	2877 3122	vegawong@nt.com.hk
CGC	Site Agent	Wong Fai	9785 2545	3wsd20@gmail.com
CGC	Environmental Officer	Walter Man	6711 9155	cgc.walterman@gmail.com
AUES	Environmental Team Leader	T. W. Tam	2959 6059	twtam@fordbusiness.com
AUES	Environmental Consultant	Nicola Hon	2959 6059	nicolahon@fordbusiness.com
AUES	Environmental Consultant	Martin Li	2959 6059	martinli@fordbusiness.com
AUES	Assistant Environmental Consultant	Fai So	2959 6059	faiso@fordbusiness.com

**Legend:***WSD (Employer) – Water Supplies Department**Binnies (Engineer Representative) – Binnies Hong Kong Limited**CGC (Main Contractor) – China Geo-Engineering Corporation**N&T (IEC) – Nature & Technologies (HK) Limited**AUES (ET) – Action-United Environmental Services and Consulting (AUES)*

## **Appendix C**

### **Master Construction Program and Site Overview Photo in the Reporting Period**

ID	Task Name	Duration	Start	Finish	TRA	Predecessors	Successors	Gantt Chart																												
1	Key Dates	1676 days	Jul 30 '21	Mar 1 '26				21	Q2	Q3	Q4	2022	Q1	Q2	Q3	Q4	2023	Q1	Q2	Q3	Q4	2024	Q1	Q2	Q3	Q4	2025	Q1	Q2	Q3	Q4	2026	Q1	Q2	Q3	Q4
2	Contract Date	1 day	Jul 30 '21	Jul 30 '21																																
3	Starting Date	1 day	Jul 30 '21	Jul 30 '21																																
4	Contract Period	1675 days	Jul 31 '21	Mar 1 '26																																
5	Section 1 - Shek Wu Hui Water Reclamation Plant (SWHWRP)	791 days	Jul 31 '21	Sep 29 '23			14FF																													
6	Section 2 - Landscaping works of SWHWRP	791 days	Jul 31 '21	Sep 29 '23			14FF																													
7	Section 3 - Modification of Table Hill Reclaimed Water Service Reservoir	791 days	Jul 31 '21	Sep 29 '23			14FF																													
8	Section 4 - Mainlaying works in part 3 of the Site	791 days	Jul 31 '21	Sep 29 '23			14FF																													
9	Section 5 - Mainlaying works in part 4 of the Site	1095 days	Jul 31 '21	Jul 29 '24			14FF																													
10	Section 6 - Mainlaying works in part 5 of the Site	1279 days	Jul 31 '21	Jan 29 '25			14FF																													
11	Section 7 - Mainlaying works in part 6 of the Site	1522 days	Jul 31 '21	Sep 29 '25			14FF																													
12	Section 8 - Mainlaying works in part 7 of the Site & remaining WM works	1675 days	Jul 31 '21	Mar 1 '26			14FF																													
13	Section 9 - Conversion works of reclaimed water	1675 days	Jul 31 '21	Mar 1 '26			14FF																													
14	Contract Completion date	0 days	Mar 1 '26	Mar 1 '26		5FF,6FF,7FF,8FF,9FF,10FF																														
15																																				
16	Preliminary & General	1676 days	Jul 30 '21	Mar 1 '26																																
96																																				
97	Section 1 & 2 - Construction of SWHWRP and Landscaping Works	829 days	Aug 27 '21	Dec 3 '23																																
98	Access Date (part 1 of the Site)	1 day	Aug 27 '21	Aug 27 '21			99																													
99	Site clearance	7 days	Aug 28 '21	Sep 3 '21		98	100																													
100	Initial survey	7 days	Sep 4 '21	Sep 10 '21		99																														
101	Installation of monitoring instruments and take initial readings	28 days	Nov 1 '21	Nov 28 '21																																
102	Environmental baseline monitoring by ET	33 days	Nov 4 '21	Dec 6 '21			110																													
103	Foundation Works - ReWPS	321 days	Aug 31 '21	Jul 17 '22			173																													
104	Submission and approval of subletting package for pre-drilling works	7 days	Aug 31 '21	Sep 6 '21			105																													
105	Selection of pre-drilling subcontractor	13 days	Sep 7 '21	Sep 19 '21		104	106																													
106	Pre-drilling works (15 nos.)	12 days	Sep 20 '21	Oct 1 '21		105	138,107																													
107	Pre-drill log report and Point Load Test	6 days	Oct 2 '21	Oct 7 '21		106	109,108																													
108	CE-020 _ Inclement Weather in October 2021	3 days	Oct 8 '21	Oct 10 '21		107																														
109	Design review for foundation works	28 days	Oct 8 '21	Nov 4 '21		107	110																													
110	Piling works (54 nos. of pre-bored H piles) - Total length = 2387m	85 days	Dec 7 '21	Mar 1 '22		102,109	111																													
111	CE-040 _ Inclement Weather in February 2022	3.5 days	Mar 2 '22	Mar 5 '22		110	112																													
112	Installation of King Post	7 days	Mar 5 '22	Mar 12 '22		111	119FS+3 days,113																													
113	CE-041 _ Inclement Weather in March 2022	5 days	Mar 12 '22	Mar 17 '22		112	114																													
114	Testing of pre-bored H-pile - tension load test	23.5 days	Mar 17 '22	Apr 9 '22		113	120																													
115	Site ready for setting up of tension load test	0 days	Mar 17 '22	Mar 17 '22			116																													
116	(CE-044) EoT due to Shortage of Acetylene Gas Supply	15 days	Mar 17 '22	Apr 1 '22		115	117																													
117	Setting up of load test	4.5 days	Apr 1 '22	Apr 5 '22		116	118																													
118	Tension Load Test	4 days	Apr 6 '22	Apr 9 '22		117																														
119	Sheet piling works for ELS - 300 pcs (length 12m)	10 days	Mar 15 '22	Mar 25 '22		112FS+3 days	120,127SS,128SS																													
120	Excavation works (6900m3) and ELS installation	55 days	Apr 10 '22	Jun 3 '22		114,119																														
121	(CE-044) EoT due to Shortage of Acetylene Gas Supply	24 days	Apr 10 '22	May 3 '22			122																													
122	ELS installation and excavation	25 days	May 4 '22	May 28 '22		121	123FS-11 days																													
123	Welding of pile head capping plate	15 days	May 18 '22	Jun 1 '22		122FS-11 days	124FS-3 days,125FS-6 days																													
124	CE-0xx _ Inclement Weather in May 2022 (under assessment)	5 days	May 30 '22	Jun 3 '22		123FS-3 days	126																													
125	Laying of blinding layer (1st pour)	1 day	May 27 '22	May 27 '22		123FS-6 days	126																													
126	Laying of blinding layer (2nd pour)	3 days	Jun 4 '22	Jun 6 '22		124,125	130																													
127	Submission and acceptance of method statement for pile cap construction	45 days	Mar 15 '22	Apr 29 '22		119SS																														

Project: 3WSD20 Programme  
Date: Aug 25 '22

Task

Split

Milestone

Summary

Project Summary

Inactive Task

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup

Manual Summary

Start-only

Finish-only

External Tasks

External Milestone

Deadline

Critical

Critical Split

Progress

Manual Progress

Page 1

ID	Task Name	Duration	Start	Finish	TRA	Predecessors	Successors	Gantt Chart																												
								2021	Q2	Q3	Q4	2022	Q1	Q2	Q3	Q4	2023	Q1	Q2	Q3	Q4	2024	Q1	Q2	Q3	Q4	2025	Q1	Q2	Q3	Q4	2026	Q1	Q2	Q3	Q4
128	Submission and acceptance of water proofing material	45 days	Mar 15 '22	Apr 29 '22		119SS																														
129	Concrete mix submission, plant trial and acceptance of Grade 50 concrete	45 days	Mar 9 '22	Apr 22 '22																																
130	Construction of pile cap	34 days	Jun 7 '22	Jul 10 '22		126																														
131	CE-0xx _ Inclement Weather in June 2022 (under assessment)	7 days	Jun 7 '22	Jun 13 '22			132																													
132	Installation of water proofing system and testing	10 days	Jun 14 '22	Jun 23 '22		131	133																													
133	CE-025 _ GI works of Contract ND/2021/01	2 days	Jun 24 '22	Jun 25 '22		132	134																													
134	Rebar fixing	9 days	Jun 26 '22	Jul 4 '22		133	135																													
135	Concreting of pile cap (996 m3)	6 days	Jul 5 '22	Jul 10 '22		134	136																													
136	Backfilling to pile cap top level	7 days	Jul 11 '22	Jul 17 '22		135																														
137	Foundation Works - HCF	339 days	Oct 2 '21	Sep 5 '22			289,324																													
138	Pre-drilling works (25 nos.)	20 days	Oct 2 '21	Oct 21 '21		106	139																													
139	CE-020 _ Inclement Weather in October 2021	3 days	Oct 22 '21	Oct 24 '21		138	140																													
140	Pre-drill log report and Point Load Test	11 days	Oct 25 '21	Nov 4 '21		139	141																													
141	Design review for foundation works	30 days	Nov 5 '21	Dec 4 '21		140	142																													
142	Piling works - HCF (56 nos. of pre-bored H piles) - Total length = 1871m	77 days	Dec 14 '21	Feb 28 '22		141	143																													
143	CE-040 _ Inclement Weather in February 2022	3.5 days	Mar 1 '22	Mar 4 '22		142	145,144FS+6 days																													
144	Testing of pre-bored H-pile - proof drilling	7 days	Mar 10 '22	Mar 17 '22		143FS+6 days																														
145	CE-041 _ Inclement Weather in March 2022	5 days	Mar 4 '22	Mar 9 '22		143	146,150FS+17 days																													
146	Testing of pre-bored H-pile - compression load test	60.5 days	Mar 9 '22	May 8 '22		145	154,151																													
147	(CE-044) EoT due to Shortage of Acetylene Gas Supply	35 days	Mar 9 '22	Apr 13 '22			148																													
148	Construction of mini-piles and setting up of load test	21 days	Apr 13 '22	May 4 '22		147	149																													
149	Compression load test	4.5 days	May 4 '22	May 8 '22		148																														
150	Sheet piling works for ELS - 425 pcs (length 6m)	13 days	Mar 26 '22	Apr 8 '22	3	145FS+17 days	154																													
151	CE-025 _ GI works of Contract ND/2021/01	2 days	May 9 '22	May 10 '22		146	152																													
152	CE-0xx _ Inclement Weather in May 2022 (under assessment)	5 days	May 11 '22	May 15 '22		151	153																													
153	CE-0xx _ Inclement Weather in June 2022 (under assessment)	7 days	May 16 '22	May 22 '22		152	154																													
154	Excavation works (7600m3)	37 days	May 23 '22	Jun 28 '22		146,150,153	155FS-12 days																													
155	Welding of pile head capping plate	28 days	Jun 17 '22	Jul 14 '22		154FS-12 days	156																													
156	CE-0xx _ Inclement Weather in July 2022 (under assessment)	4 days	Jul 15 '22	Jul 18 '22		155	157FS-24 days																													
157	Laying of blinding layer	22 days	Jun 25 '22	Jul 16 '22		156FS-24 days	158																													
158	Construction of pile cap	41 days	Jul 17 '22	Aug 26 '22		157																														
159	Installation of water proofing system and testing	14 days	Jul 17 '22	Jul 30 '22			160FS-10 days																													
160	Rebar fixing	28 days	Jul 21 '22	Aug 17 '22		159FS-10 days	161FS-7 days																													
161	Concreting of pile cap - 1600m3	5 days	Aug 11 '22	Aug 15 '22		160FS-7 days	162																													
162	Concreting of pile cap - 400m3	6 days	Aug 16 '22	Aug 21 '22		161	163																													
163	Concreting of pile cap - 1000m3	5 days	Aug 22 '22	Aug 26 '22		162	164																													
164	Backfilling of general fill material to pile cap top level	10 days	Aug 27 '22	Sep 5 '22		163																														
165																																				
166	Construction of SWHWRP	560 days	May 1 '22	Nov 11 '23			538FF																													
167	Submission and acceptance of DfMA proposal for bathroom unit, valves chamber, water refilling station	60 days	Jun 9 '22	Aug 7 '22			168																													
168	Selection of Supplier for DfMA	21 days	Aug 8 '22	Aug 28 '22		167	169																													
169	Manufacture of DfMA Precast Segments	20 days	Aug 29 '22	Sep 17 '22		168	170																													
170	Installation of DfMA segments	90 days	Sep 18 '22	Dec 16 '22		169																														
171	Submission and acceptance of method statement for construction of ReWPS and HCF	30 days	May 3 '22	Jun 1 '22			173																													
172	Construction of RC structure of ReWPS	282 days	Jul 18 '22	Apr 25 '23			375FS-60 days,398																													
173	Construction of basement (below ground)	103 days	Jul 18 '22	Oct 28 '22		103,171	195,196																													
174	Removal of ELS strut and wailing (2nd layer)	2 days	Jul 18 '22	Jul 19 '22			175																													
175	Construction of external walls, W6, W8-W15, beams and slabs (+0mPD to +3.6mPD)	52 days	Jul 20 '22	Sep 9 '22		174																														

Project: 3WSD20 Programme Date: Aug 25 '22	Task		Inactive Task		Manual Summary Rollup		External Milestone		Manual Progress	
	Split		Inactive Milestone		Manual Summary		Deadline			
	Milestone		Inactive Summary		Start-only		Critical			
	Summary		Manual Task		Finish-only		Critical Split			
	Project Summary		Duration-only		External Tasks		Progress			

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ID	Task Name	Duration	Start	Finish	TRA	Predecessors	Successors	2021				2022				2023				2024				2025				2026			
								Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
368	On duty contact tank	14 days	May 4 '23	May 17 '23		367	369																								
369	Standby contact tank	14 days	May 18 '23	May 31 '23		368	370																								
370	Overall water retaining structure at HCF	14 days	Jun 1 '23	Jun 14 '23		369																									
371	Installation of internal finishing works for Grid Line 3-7	14 days	Jun 15 '23	Jun 28 '23		366																									
372	Construction of water proofing system at roof slab of HCF	15 days	May 4 '23	May 18 '23		355	373																								
373	Water tightness test for roof slab of HCF	15 days	May 19 '23	Jun 2 '23		372																									
374	WWO542 design submission for Street Fire Hydrant, potable, flushing, cleansing & irrigation water supply	180 days	May 1 '22	Oct 27 '22			375																								
375	Construction of roadworks	90 days	Feb 25 '23	May 25 '23		172FS-60 days,374	515,390,393SS																								
376	Construction of fence wall	90 days	Feb 25 '23	May 25 '23			385SS																								
377	Type-1 fence wall at East side (189m)	63 days	Feb 25 '23	Apr 28 '23			384																								
378	Type-2 & Type-3 fence wall at West side (198m)	66 days	Feb 25 '23	May 1 '23			384																								
379	Type-3 fence wall at North side (44m)	15 days	Feb 25 '23	Mar 11 '23			380																								
380	Type-2 & Type-3 fence wall at South side (37m)	13 days	Mar 12 '23	Mar 24 '23		379	381																								
381	Type-4 fence wall at middle (28m)	10 days	Mar 25 '23	Apr 3 '23		380	382																								
382	Installation of Gate 1 and Gate 2	7 days	Apr 4 '23	Apr 10 '23		381	384																								
383	Fabrication of steelworks	66 days	Feb 25 '23	May 1 '23			384																								
384	Installation of wall finishes and steelworks	24 days	May 2 '23	May 25 '23		377,378,382,383																									
385	Construction of underground utilities	60 days	Feb 25 '23	Apr 25 '23		376SS	514																								
386	Laying of pipe work system outside ReWPS and HCF	30 days	Feb 25 '23	Mar 26 '23																											
387	Construction of chambers and water refilling station	45 days	Feb 25 '23	Apr 10 '23			388																								
388	Installation of surge vessels	15 days	Apr 11 '23	Apr 25 '23		387																									
389	Construction of underground utilities (drainage, irrigation system, cable ducting, CLP cable ducts & drawpits, street fire hydrant, etc)	60 days	Feb 25 '23	Apr 25 '23																											
390	Construction of EVA road pavement	30 days	May 26 '23	Jun 24 '23		375	521																								
391	Construction of road pavement near ReWPS	15 days	May 26 '23	Jun 9 '23			392																								
392	Construction of road pavement near HCF	15 days	Jun 10 '23	Jun 24 '23		391																									
393	Design submission and fabrication of steelwork system for the aluminum fin	120 days	Feb 25 '23	Jun 24 '23		375SS																									
394	Design submission of steelwork system for vertical aluminum fin at ReWPS	30 days	Feb 25 '23	Mar 26 '23			395,396																								
395	Design submission of steelwork system for horizontal aluminum fin at HCF	30 days	Mar 27 '23	Apr 25 '23		394	397																								
396	Fabrication of vertical aluminum fin for ReWPS	60 days	Mar 27 '23	May 25 '23		394																									
397	Fabrication of horizontal aluminum fin for HCF	60 days	Apr 26 '23	Jun 24 '23		395																									
398	Installation of architectural works	136 days	Jun 29 '23	Nov 11 '23		172,288	409SS																								
399	Installation of architectural works near ReWPS	136 days	Jun 29 '23	Nov 11 '23																											
400	Erection of working platform	7 days	Jun 29 '23	Jul 5 '23			401																								
401	Laying of artificial granite tile at external wall	60 days	Jul 6 '23	Sep 3 '23		400	402FS-14 days																								
402	Installation of steelworks	60 days	Aug 21 '23	Oct 19 '23		401FS-14 days	403FS-7 days																								
403	Installation of cladding	30 days	Oct 13 '23	Nov 11 '23		402FS-7 days																									
404	Installation of architectural works near HCF	136 days	Jun 29 '23	Nov 11 '23																											
405	Erection of working platform	7 days	Jun 29 '23	Jul 5 '23			406																								
406	Laying of artificial granite tile at external wall	60 days	Jul 6 '23	Sep 3 '23		405	407FS-14 days																								
407	Installation of steelworks	60 days	Aug 21 '23	Oct 19 '23		406FS-14 days	408FS-7 days																								
408	Installation of cladding	30 days	Oct 13 '23	Nov 11 '23		407FS-7 days																									
409	Landscape works	158 days	Jun 29 '23	Dec 3 '23		398SS	539FF																								
410	Landscape works at roof top	58 days	Jun 29 '23	Aug 25 '23			414																								
411	Installation of composite timber decking with pedestal	14 days	Jun 29 '23	Jul 12 '23			412																								
412	Laying of artificial granite floor tile / paver block	30 days	Jul 13 '23	Aug 11 '23		411	413																								
413	Construciton of roof drainage system	14 days	Aug 12 '23	Aug 25 '23		412																									
414	Landscape works within SWHWRP	100 days	Aug 26 '23	Dec 3 '23		410																									

Project: 3WSD20 Programme  
Date: Aug 25 '22

Task

Split

Milestone

Summary

Project Summary

Inactive Task

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup

Manual Summary

Start-only

Finish-only

External Tasks

External Milestone

Deadline

Critical

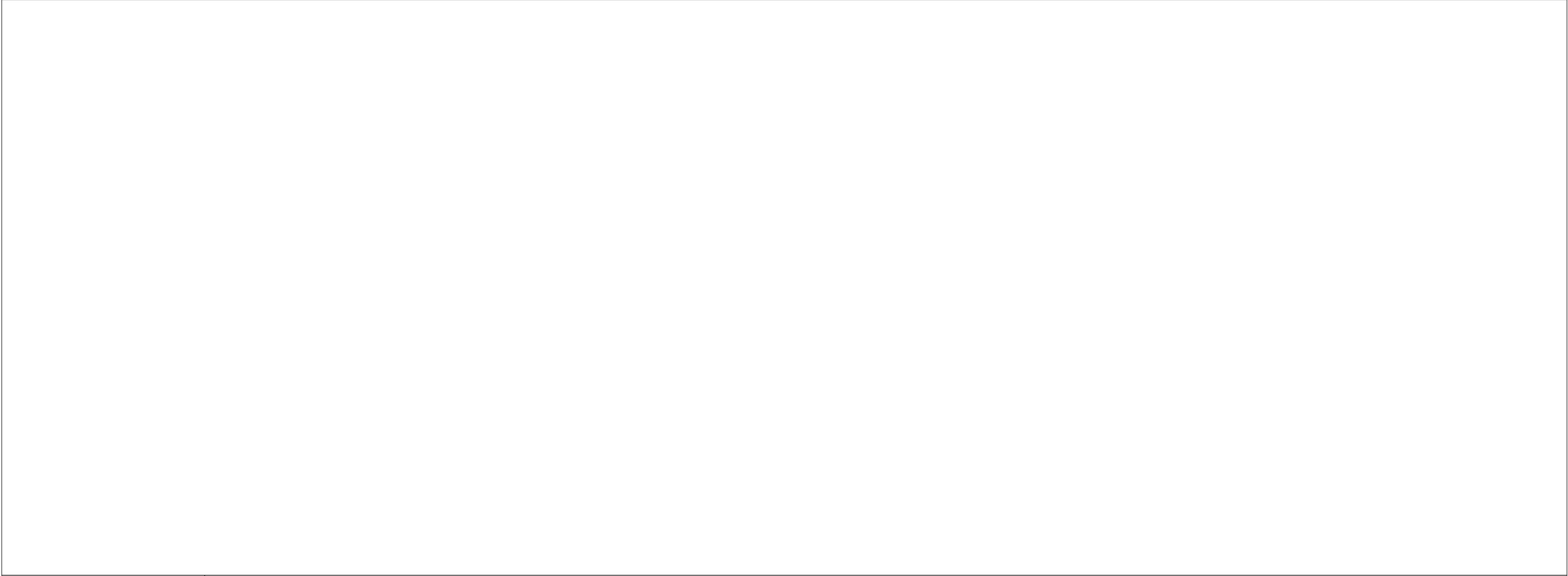
Critical Split

Progress

Manual Progress

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ID	Task Name	Duration	Start	Finish	TRA	Predecessors	Successors	21	2022				2023				2024				2025				2026			
								Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
415	E&M Works of SWHWRP																											
416		815 days	Sep 10 '21	Dec 3 '23		538FF																						
538		Planned completion for section 1	0 days	Dec 3 '23	Dec 3 '23		166FF,416FF																					
539		Planned completion for section 2	0 days	Dec 3 '23	Dec 3 '23		409FF																					
540																												
541	Section 3 - Modification of Table Hill Reclaimed Water Service Reservoir	682 days	Oct 1 '21	Aug 13 '23																								
550																												
551	Section 4 - Water main laying works in part 3 of the Site	821 days	Jul 30 '21	Oct 28 '23																								
904																												
905	Section 5 - Water main laying works in part 4 of the Site	1096 days	Jul 30 '21	Jul 29 '24																								
980																												
981	Section 6 - Water main laying works in part 5 of the Site	1280 days	Jul 30 '21	Jan 29 '25																								
1026																												
1027	Section 7 - Water main laying works in part 6 of the Site	1523 days	Jul 30 '21	Sep 29 '25																								
1079																												
1080	Section 8 - Water main laying works in part 7 of the Site	1676 days	Jul 30 '21	Mar 1 '26																								
1160																												
1161	Section 9 - Conversion works to effect the supply of reclaimed water	1676 days	Jul 30 '21	Mar 1 '26																								



Project: 3WSD20 Programme  
Date: Aug 25 '22

Task

Split

Milestone

Summary

Project Summary

Inactive Task

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup

Manual Summary

Start-only

Finish-only

External Tasks

External Milestone

Deadline

Critical

Critical Split

Progress

Manual Progress

**SITE OVERVIEW PHOTO IN THE REPORTING PERIOD**



Rebar fixing work at HCF



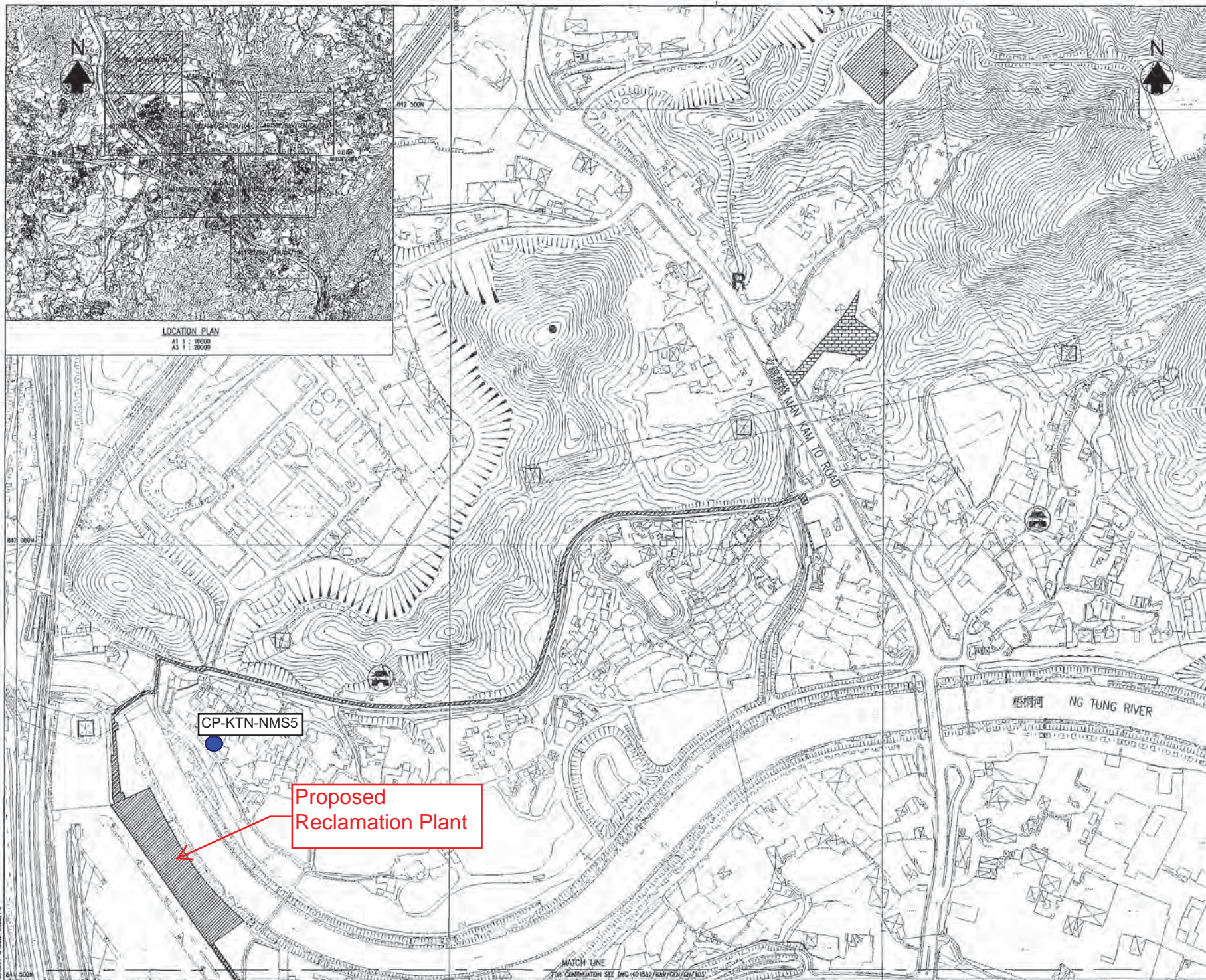
Formwork erection and scaffolding work at ReWSP



## **Appendix D**

### **Location of Designated Noise Monitoring Station CP-KTN-NMS5**





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**NOTES:**

1. ALL LEVELS ARE IN REFERENCE TO METRES ABOVE THE HONG KONG PRINCIPAL DATUM (HKPD) UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES, REFER TO 401582/BAW/GEN/CH/001
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.

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1. THE BASE PLAN IS EXTRACTED FROM SURVEY SHEET NOS. 2-NE, 2-SG, 3AW AND 3-SM.

**LEGEND:**

[Hatched Box]	PART 1 OF THE SITE
[Hatched Box]	PART 2 OF THE SITE
[Hatched Box]	PART 3 OF THE SITE
[Hatched Box]	PART 4 OF THE SITE
[Hatched Box]	PART 5 OF THE SITE
[Hatched Box]	PART 6 OF THE SITE
[Hatched Box]	PART 7 OF THE SITE
[Hatched Box]	PART 11 OF THE SITE

Rev.	Description		Date
	By	Check	
1	CWC	WH	02/21
2	CC	CC	02/21

Approved: \_\_\_\_\_

Contract No. 3/WSD/20

Contract Title: RECLAIMED WATER SUPPLY TO SHEUNG SHUI AND FANLING

Drawing Title: Noise Monitoring Station



## **Appendix E**

### **Valid Calibration Certificates of Monitoring Equipment**





輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

# Certificate of Calibration

## 校正證書

Certificate No. : C216479

證書編號

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

Description / 儀器名稱 : Sound Level Meter (EQ016)

Manufacturer / 製造商 : Rion

Model No. / 型號 : NL-52

Serial No. / 編號 : 00464681

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

### TEST CONDITIONS / 測試條件

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

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

Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 9 November 2021

### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

The results do not exceed manufacturer's specification.


The results are detailed in the subsequent page(s).

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

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

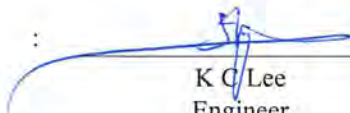
Tested By

測試

  
K P Cheuk  
Project Engineer

Certified By

核證

  
K C Lee  
Engineer

Date of Issue

簽發日期

10 November 2021

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

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

Sun Creation Engineering Limited - Calibration & Testing Laboratory

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

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號四樓

Tel/電話: (852) 2927 2606

Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

# Certificate of Calibration

## 校正證書

Certificate No. : C216479

證書編號

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

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

5. Test procedure : MA101N.

6. Results :

### 6.1 Sound Pressure Level

#### 6.1.1 Reference Sound Pressure Level

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

#### 6.1.2 Linearity

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

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

### 6.2 Time Weighting

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

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# Certificate of Calibration

## 校正證書

Certificate No. : C216479

證書編號

### 6.3 Frequency Weighting

#### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>A</sub>	A	Fast	94.00	63 Hz	67.3	-26.2 ± 1.5
					125 Hz	77.4	-16.1 ± 1.5
					250 Hz	84.9	-8.6 ± 1.4
					500 Hz	90.4	-3.2 ± 1.4
					1 kHz	93.6	Ref.
					2 kHz	94.8	+1.2 ± 1.6
					4 kHz	94.6	+1.0 ± 1.6
					8 kHz	92.6	-1.1 (+2.1 ; -3.1)
					16 kHz	85.7	-6.6 (+3.5 ; -17.0)

#### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>C</sub>	C	Fast	94.00	63 Hz	92.7	-0.8 ± 1.5
					125 Hz	93.4	-0.2 ± 1.5
					250 Hz	93.6	0.0 ± 1.4
					500 Hz	93.6	0.0 ± 1.4
					1 kHz	93.6	Ref.
					2 kHz	93.5	-0.2 ± 1.6
					4 kHz	92.8	-0.8 ± 1.6
					8 kHz	90.7	-3.0 (+2.1 ; -3.1)
					16 kHz	83.7	-8.5 (+3.5 ; -17.0)

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# Certificate of Calibration

## 校正證書

Certificate No. : C216479  
證書編號

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

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	: $\pm 0.35$ dB
	250 Hz - 500 Hz	: $\pm 0.30$ dB
	1 kHz	: $\pm 0.20$ dB
	2 kHz - 4 kHz	: $\pm 0.35$ dB
	8 kHz	: $\pm 0.45$ dB
	16 kHz	: $\pm 0.70$ dB
104 dB	: 1 kHz	: $\pm 0.10$ dB (Ref. 94 dB)
114 dB	: 1 kHz	: $\pm 0.10$ 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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# Certificate of Calibration

## 校正證書

Certificate No. : C216478

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC21-2189)

Date of Receipt / 收件日期 : 25 October 2021

Description / 儀器名稱 : Sound Calibrator (EQ087)

Manufacturer / 製造商 : Rion

Model No. / 型號 : NC-74

Serial No. / 編號 : 34657231

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

### TEST CONDITIONS / 測試條件

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

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

Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 9 November 2021

### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

The results do not exceed manufacturer's specification.

The results are detailed in the subsequent page(s).


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

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

Tested By

測試


:

  
K P Cheuk  
Project Engineer

Certified By

核證

:

  
K C Lee  
Engineer

Date of Issue

簽發日期

:

10 November 2021

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. : C216478  
證書編號

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

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

- Test procedure : MA100N.

- Results :

### 5.1 Sound Level Accuracy

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

### 5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.001	1 kHz $\pm 1\%$	$\pm 1$

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

Note :

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

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

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## **Appendix F**

### **Monitoring Schedule of the Reporting Month and Coming Month**



**The Reporting Monitoring Schedule (September 2022)**

Date		Noise Monitoring (Leq30min)	Ecology Monitoring (Water Bird) <sup>Note</sup>
Thu	1-Sep-22		
Fri	2-Sep-22		
Sat	3-Sep-22		
Sun	4-Sep-22		
Mon	5-Sep-22		✓ (High Tide)
Tue	6-Sep-22		✓ (Low Tide)
Wed	7-Sep-22	✓	
Thu	8-Sep-22		
Fri	9-Sep-22		
Sat	10-Sep-22		
Sun	11-Sep-22		
Mon	12-Sep-22		
Tue	13-Sep-22		
Wed	14-Sep-22		✓ (High Tide)
Thu	15-Sep-22		✓ (Low Tide)
Fri	16-Sep-22	✓	
Sat	17-Sep-22		
Sun	18-Sep-22		
Mon	19-Sep-22		
Tue	20-Sep-22		✓ (High Tide)
Wed	21-Sep-22		✓ (Low Tide)
Thu	22-Sep-22		
Fri	23-Sep-22	✓	
Sat	24-Sep-22		
Sun	25-Sep-22		
Mon	26-Sep-22		✓ (Low Tide)
Tue	27-Sep-22		
Wed	28-Sep-22	✓	✓ (High Tide)
Thu	29-Sep-22		
Fri	30-Sep-22		

✓	Monitoring Day
	Sunday or Public Holiday

**The Coming Month Monitoring Schedule (October 2022)**

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

*Note:**Ecology monitoring dates are tentative and are subject to change*

✓	Monitoring Day
	Sunday or Public Holiday

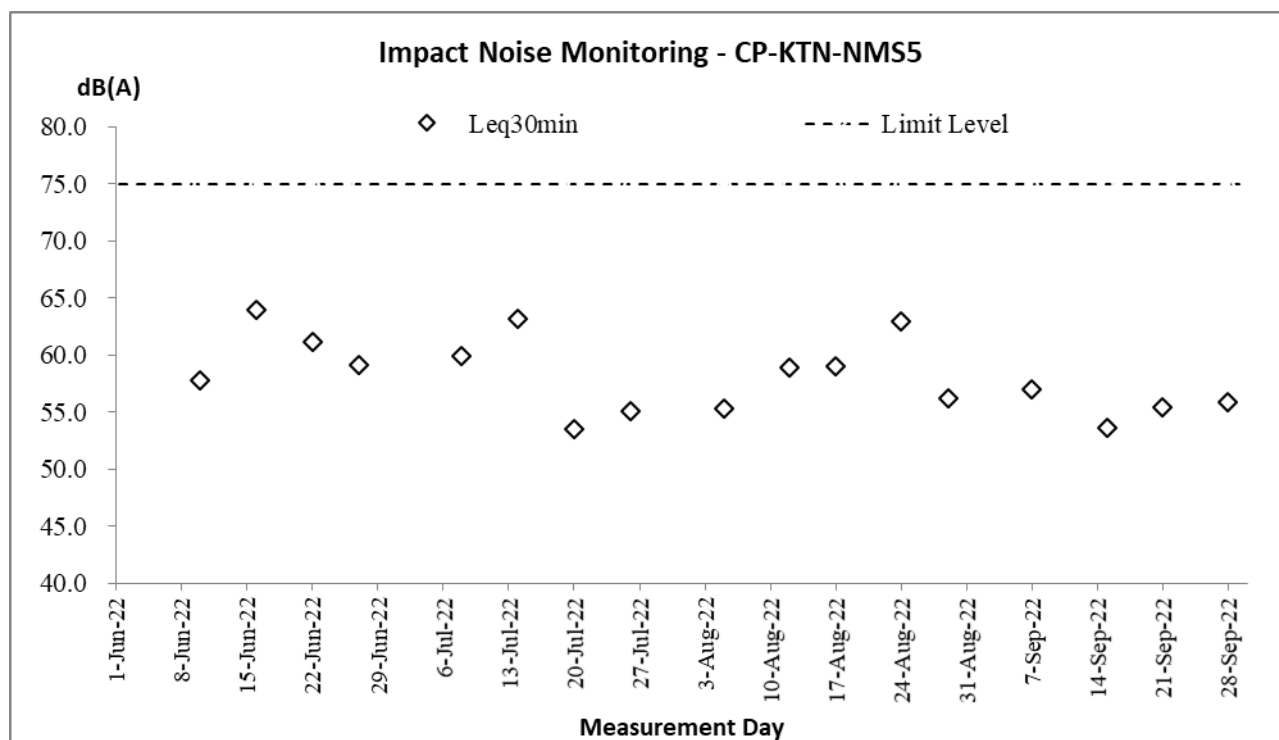
## **Appendix G**

### **Database of Monitoring Result**

Daytime Noise Measurement Results (dB) at CP-KTN-NMS5																					
Date	Start Time	1st Leq (5min)			2nd Leq (5min)			3rd Leq (5min)			4th Leq (5min)			5th Leq (5min)			6th Leq (5min)			Leq30min, dB(A)	Corrected Leq30min dB(A)
		Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)	Leq, dB(A)	L10, dB(A)	L90, dB(A)		
7-Sep-22	13:12	56.6	57.6	53.5	54.8	55.9	53.6	57.1	60.0	52.2	58.5	61.1	53.6	57.7	60.6	52.9	56.6	56.9	53.6	57.0	60.0
15-Sep-22	9:14	52.9	55.0	50.3	54.1	55.6	50.9	55.4	58.6	50.8	54.1	56.8	50.7	51.4	52.9	49.8	52.5	53.9	49.9	53.6	56.6
21-Sep-22	11:13	58.8	60.2	51.5	58.2	62.0	51.7	52.9	54.5	50.5	52.6	54.1	50.8	52.4	54.6	50.1	51.7	52.6	49.7	55.5	58.5
28-Sep-22	15:01	56.8	59.3	50.1	58.3	61.1	52.1	52.4	55.5	49.8	53.4	56.4	50.3	55.4	57.6	52.3	56.3	58.6	51.3	55.9	58.9

## **Appendix H**

### **Graphical Plots for Monitoring Result**



## **Appendix I**

### **Monthly Summary Waste Flow Table**



Contract No. : 3/WSD/20

Contact Name: Reclaimed Water Supply to Sheung Shui and Fanling**Monthly Summary Waste Flow Table for \_2022\_\_ (year)**

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 <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
Jan	0.3031	0	0	0	0.3031	0	0	0	0	0	0.0016
Feb	0.5411	0	0	0	0.5411	0	0	0	0	0	0.0019
Mar	0.8459	0	0	0	0.8459	0	0	0	0	0	0.0014
Apr	3.2205	0	0	0	3.2205	0	0	0	0	0	0.0024
May	4.5178	0	0	0.39	4.1278	0	0	0	0	0	0.0057
June	6.3073	0	0	1.6148	4.6925	0	0	0	0	0	0.0017
July	0.8427	0	0	0	0.8427	0	0	0	0	0	0.0078
Aug	0.3786	0	0	0	0.3786	0	0	0	0	0	0.0071
Sept	0.1983	0	0.0144	0	0.1839	0	0	0	0	0	0.0154
Oct											
Nov											
Dec											
Total	16.8825	0	0.0144	2.0048	15.1361	0	0	0	0	0	0.045

Forecast of Total Quantities of C&D Materials to be Generated from the Contract*										
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 <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
25.472	5.386	0	0	25.472	0	0	0	0	0	0.3885

- Notes:
- (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
  - (2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
  - (3) The quantities of C&D material indicated in the half-yearly status report should be in tonnes. If the project offices do not have information on the densities of the material for the time being, they could initially adopt the following conversion factors for reporting purpose: insitu densities of rock and soil to be 2.5 tonnes/m<sup>3</sup> and 2.0 tonnes/m<sup>3</sup> respectively; and densities of imported rock and soil to be 2.0 tonnes/m<sup>3</sup> and 1.8 tonnes/m<sup>3</sup> respectively.
  - (4) Broken concrete and bitumen = 2.4 tonnes/m<sup>3</sup>
  - (5) Conversion to 1000m<sup>3</sup> for general refuse is weight in 1000kg multiply by 0.002

## **Appendix J**

### **Implementation Schedule for Environmental Mitigation Measures (ISEMM)**

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the Measures?	Location of the measures	When to implement the Measures?	What requirements or standards for the measures to achieve?
<b>Common Mitigation Measures (Applicable to ALL Project Components, including DPs and Non-DPs)</b>							
<b>Construction Dust Impact</b>							
S3.8	D1	Mitigation measures in form of regular watering under a good site practice should be adopted. Watering once per hour on exposed worksites and haul road is proposed to achieve dust removal efficiency of 92.1%. While the above watering frequencies are to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.7 L/m <sup>2</sup> to achieve the respective dust removal efficiencies.	Minimize 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
S3.8	D2	The Contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation.	Minimize 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
S3.8	D3	Following dust suppression measures should also be incorporated by the Contractor to control the dust nuisance throughout the construction phase: <ul style="list-style-type: none"> <li>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;</li> <li>Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;</li> <li>A stockpile of dusty material should not extend beyond the pedestrian barriers, fencing or traffic cones;</li> <li>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;</li> <li>Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hard cores;</li> <li>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 with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period;</li> </ul>	Minimize 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

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the Measures?	Location of the measures	When to implement the Measures?	What requirements or standards for the measures to achieve?
		<ul style="list-style-type: none"> <li>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;</li> <li>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;</li> <li>Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet;</li> <li>Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;</li> <li>Any skip hoist for material transport should be totally enclosed by impervious sheeting; and</li> <li>Every stock of more than 20 bags of cement or dry pulverized fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides.</li> </ul>					
<b>Noise Impact (Construction Phase)</b>							
S4.9	N1	Implement the following good site management practices: <ul style="list-style-type: none"> <li>only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme;</li> <li>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;</li> <li>plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs;</li> <li>silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works;</li> <li>mobile plant should be sited as far away from NSRs as possible and practicable; and</li> <li>material stockpiles, mobile container site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.</li> </ul>	Control construction airborne noise	Contractor	All construction sites	Construction phase	Annex 5, TM-EIAO
S4.9	N2	Install temporary site hoarding (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	Contractor	All construction sites	Construction phase	Annex 5, TM-EIAO

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the Measures?	Location of the measures	When to implement the Measures?	What requirements or standards for the measures to achieve?
			zone of NSRs through partial screening.				
S4.9	N3	Install movable noise barriers, full enclosure and acoustic mat, screen the noisy plants including air compressor and generator.	Screen the noisy plant items to be used at all construction sites	Contractor	All construction sites	Construction phase	Annex 5, TM-EIAO
S4.9	N4	Use of "Quiet" Plant and Working Methods	Reduce the noise levels of plant items	Contractor	All construction sites	Construction phase	Annex 5, TM-EIAO
S4.9	N5	Sequencing operation of construction plants where practicable.	Operate sequentially within the same work site to reduce the construction airborne noise	Contractor	All construction sites	Construction phase	Annex 5, TM-EIAO
<b>Water Quality Impact (Construction Phase)</b>							
S5.7	W1	<p>Construction Runoff</p> <p>In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN 1/94), construction phase mitigation measures should be provided and the Storm Water Pollution Control Plan is given below.</p> <p><b>Storm Water Pollution Control Plan</b></p> <ul style="list-style-type: none"> <li>At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (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.</li> <li>Diversion of natural stormwater should be provided 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 minimize polluted runoff. Sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8m3 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</li> </ul>	Control construction runoff	Contractor	All construction sites	Construction phase	WPCO, EIAO, TM-EIAO

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the Measures?	Location of the measures	When to implement the Measures?	What requirements or standards for the measures to achieve?
		<p>where the influent is pumped.</p> <ul style="list-style-type: none"> <li>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 silt/sediment trap. The silt/sediment traps should be incorporated in the permanent drainage channels to enhance deposition rates.</li> <li>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 should be undertaken by the Contractor prior to the commencement of construction.</li> <li>Construction works should be programmed to minimize surface excavation works during the rainy seasons (April to September). All exposed earth areas should be 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.</li> <li>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.</li> <li>Measures should be taken to minimize the ingress of site drainage into excavations. 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.</li> <li>All open stockpiles of construction materials (for example, aggregates, sand and fill material) of more than 50m<sup>3</sup> 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.</li> <li>Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers.</li> <li>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</li> </ul>					



EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the Measures?	Location of the measures	When to implement the Measures?	What requirements or standards for the measures to achieve?
		<p>during storm events.</p> <ul style="list-style-type: none"> <li>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. 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.</li> <li>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.</li> <li>Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts.</li> <li>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.</li> <li>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 meander, wetlands and fish ponds.</li> </ul>					
S5.7	W2	<p><b>Sewage from Workforce</b></p> <ul style="list-style-type: none"> <li>Portable chemical toilets and sewage holding tanks should be provided 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.</li> <li>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. It is anticipated that sewage generation during the construction phase of the Project would not cause water quality impact after undertaking all required measures.</li> </ul>	Handling of site sewage	Contractor	All construction sites	Construction phase	WPCO, EIAO, TM-EIAO

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the Measures?	Location of the measures	When to implement the Measures?	What requirements or standards for the measures to achieve?
<b>Waste Management (Construction Waste)</b>							
S7.6	WM1	<p>Waste Reduction Measures</p> <p>Waste reduction is best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices. The following recommendations are proposed to achieve reduction:</p> <ul style="list-style-type: none"> <li>• segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal;</li> <li>• proper storage and site practices to minimize the potential for damage and contamination of construction materials;</li> <li>• plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste;</li> <li>• sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); and</li> <li>• provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling.</li> </ul>	Reduce waste generation	Contractor	All construction sites where practicable	Prior to the commencement of construction	Waste Disposal Ordinance
S7.6	WM2	Prepare Waste Management Plan and submit to the Engineer for approval	Minimize waste generation during construction	Contractor	All construction sites	Construction phase	Waste Disposal Ordinance
S7.6	WM3	<p><b><u>Good Site Practice</u></b></p> <p>The following good site practices are recommended throughout the construction activities:</p> <ul style="list-style-type: none"> <li>• 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;</li> <li>• training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling;</li> <li>• provision of sufficient waste disposal points and regular collection for disposal;</li> <li>• appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;</li> <li>• regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors;</li> </ul>	Minimize waste generation during construction	Contractor	All construction sites	Construction phase	Waste Disposal Ordinance
S7.6	WM4	<p><b><u>Storage of Waste</u></b></p> <p>The following recommendation should be implemented to minimize the impacts:</p>	Minimize waste from storage impacts	Contractor	All construction	Construction phase	Waste Disposal Ordinance

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the Measures?	Location of the measures	When to implement the Measures?	What requirements or standards for the measures to achieve?
		<ul style="list-style-type: none"> <li>waste such as soil should be handled and stored well to ensure secure containment;</li> <li>stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away;</li> <li>different locations should be designated to stockpile each material to enhance reuse;</li> </ul>			sites		
S7.6	WM5	<b>Collection and Transportation of Waste</b> The following recommendation should minimize the impacts: <ul style="list-style-type: none"> <li>remove waste in timely manner;</li> <li>employ the trucks with cover or enclosed containers for waste transportation;</li> <li>obtain relevant waste disposal permits from the appropriate authorities; and</li> <li>disposal of waste should be done at licensed waste disposal facilities.</li> </ul>	Minimize waste from storage impacts	Contractor	All construction sites	Construction phase	Waste Disposal Ordinance
S7.6	WM6	<b>Excavated and C&amp;D Material</b> 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: <ul style="list-style-type: none"> <li>maintain temporary stockpiles and reuse excavated fill material for backfilling;</li> <li>carry out on-site sorting;</li> <li>deliver surplus artificial hard materials to Tuen Mun Area 38 recycling plant or its successor for recycling into subsequent useful products;</li> <li>make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate;</li> <li>implement a recording system for the amount of waste generated, recycled and disposed of for checking;</li> </ul> Standard formwork should be used as far as practicable in order to minimize the arising of C&D waste. The use of more durable formwork (e.g. metal hoarding) or plastic facing should be encouraged in order to enhance the possibility of recycling. The purchasing of construction materials should be carefully planned in order to avoid over ordering and wastage. Wheel wash facilities have to be provided at the site entrance before the trucks leaving the works area.	Minimize waste impacts from excavated and C&D materials	Contractor	All construction sites	Construction phase	<ul style="list-style-type: none"> <li>Land (Miscellaneous Provisions) Ordinance</li> <li>Waste Disposal Ordinance</li> <li>ETWB TCW No. 19/2005</li> </ul>
S7.6	WM8	<b>Chemical Waste</b> <ul style="list-style-type: none"> <li>If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producers. 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</li> </ul>	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction phase	<ul style="list-style-type: none"> <li>Waste Disposal (Chemical Waste) General Regulation</li> <li>Code of Practice on the Packaging, Labelling and</li> </ul>

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the Measures?	Location of the measures	When to implement the Measures?	What requirements or standards for the measures to achieve?
		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.					Storage of Chemical Waste
S7.6	WM9	<b>General Waste</b> <ul style="list-style-type: none"> <li>General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling.</li> <li>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.</li> <li>A reputable waste collector should be employed to remove general refuse on a daily basis.</li> </ul>	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction phase	<ul style="list-style-type: none"> <li>Waste Disposal Ordinance</li> </ul>
S7.6	WM10	<b>Sewage</b> <ul style="list-style-type: none"> <li>The WMP should document the locations and number of portable chemical toilets depending on the number of workers, land availability, site condition and activities.</li> <li>Regularly collection by licensed collectors should be arranged to minimize potential environmental impacts.</li> </ul>	Minimize production of sewage impacts	Contractor	All construction sites	Construction phase	<ul style="list-style-type: none"> <li>Waste Disposal Ordinance</li> </ul>
S7.6	WM11	<b>Topsoil reuse</b> – Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical. This is considered a general measure for good site practice.	Good site practice	Contractor / Project Proponent	Onsite	Construction Phase	<ul style="list-style-type: none"> <li>ETWB Technical Circular (Works) No.29/2004</li> </ul>
<b>Landscape and Visual (Construction)</b>							
S.12.9 MM3	LV5	Open Space Provision - the principles adopted in the RODP planning ensure that public open space systems are incorporated. All requirements for open space areas stipulated in the planning documents for the formulation of the Preliminary Layout Plan should be adhered to.	Reprovision of open space.  Enhance visual amenity of the area and improve the overall landscape character	Government Developer / Detailed Design Consultant / Contractor	Onsite as stipulated in the planning documents for the formulation of the Preliminary Layout Plan	Prior to Construction and Construction Phase	Hong Kong Planning Standards and Guidelines (HKPSG) issued by the Planning Department (As at Aug 2011); Sustainable Building Design Guidelines
S.12.9 MM4	LV6	Tree Protection & Preservation – Existing trees to be retained within the Project Site should be carefully protected during construction. In particular OVTs will be preserved according to ETWB Technical Circular (Works) No. 29/2004. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to	Protect and Preserve Trees	Government Developer / Detailed Design Consultant / Contractor	Onsite as stipulated in the planning documents for the formulation of	Prior to Construction and Construction Phase	ETWB Technical Circular Works (TCW) No. 29/2004 and 3/2006

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the Measures?	Location of the measures	When to implement the Measures?	What requirements or standards for the measures to achieve?
		<p>undertaking any works adjacent to all retained trees, including trees in Contractor's works areas.</p> <p>A detailed tree survey will be carried out for the Tree Removal Application (TRA) process which will be carried out at the later detailed design stage of the Project. The detailed tree survey will propose which trees should be retained, transplanted or felled and will include details of tree protection measures for those trees to be retained.</p>			the Preliminary Layout Plan		
S.12.9 MM5	LV7	<p>Tree Transplantation – Trees unavoidably affected by the Project works should be transplanted where practical. Trees should be transplanted straight to their final receptor site and not held in a temporary nursery as far as possible. A detailed Tree Transplanting Specification shall be provided in the Contract Specification, where applicable. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme.</p> <p>A detailed transplanting proposal will be submitted to relevant government departments for approval in accordance with ETWBTC 2/2004 and 3/2006 and final locations of transplanted trees should be agreed prior to commencement of the work.</p> <p>For trees associated with highways e.g. roadside planting along highways, that are unavoidably affected and should be transplanted, HyD HQ/GN/13 'Interim Guidelines for Tree Transplanting Works under Highways Department's Vegetation Maintenance Ambit' should be referred to.</p>	Transplant Trees where suitable for transplantation	Government Developer / Detailed Design Consultant / Contractor	Onsite where possible. Otherwise consider offsite locations	Prior to Construction, Construction Phase & Maintenance in Operation Phase	ETWB TCW 3/2006 and 2/2004 HyD HQ/GN/13 Interim Guidelines for Tree Transplanting Works under Highways Department's Vegetation Maintenance Ambit
S.12.9 MM7	LV9	<p>Compensatory Planting – Compensatory tree planting for felled trees shall be provided to the satisfaction of relevant Government departments. Required numbers and locations of compensatory trees shall be determined and agreed separately with Government during the Tree Removal Application process under ETWBTC 3/2006.</p> <p>Compensatory planting is proposed at the potential open areas such as open spaces, amenity areas, open areas of the streetscapes, as well as the open areas within development lots.</p> <p>Compensatory planting for shrubs should be considered in suitable locations. Native species such as <i>Melastoma malabathricum</i>, <i>Diospyros vaccinioides</i>, <i>Gardenia jasminoides</i>, <i>Ixora chinensis</i>, <i>Ligustrum sinense</i>, <i>Litsea rotundifolia</i>, <i>Melastoma dodecandrum</i>, <i>Atalantia buxifolia</i>, <i>Rhodomyrtus tomentosa</i>, <i>Rhaphiolepis indica</i>, and <i>Rhododendron simsii</i> are suggested.</p>	Compensate for trees and shrubs lost due to the Project.	Government Developer / Detailed Design Consultant / Contractor	Onsite where possible. Otherwise consider offsite locations	Prior to Construction, Construction Phase & Maintenance in Operation Phase	ETWB TCW 3/2006 and 2/2004
S.12.9 MM9	LV11	Vertical Greening – Planting of climbers to grow up vertical surfaces were appropriate (e.g. building edges, piers).	Soften hard surfaces and	Project Proponent /	On appropriate	Prior to Construction,	ETWB TCW No. 11/2004 – Cyber

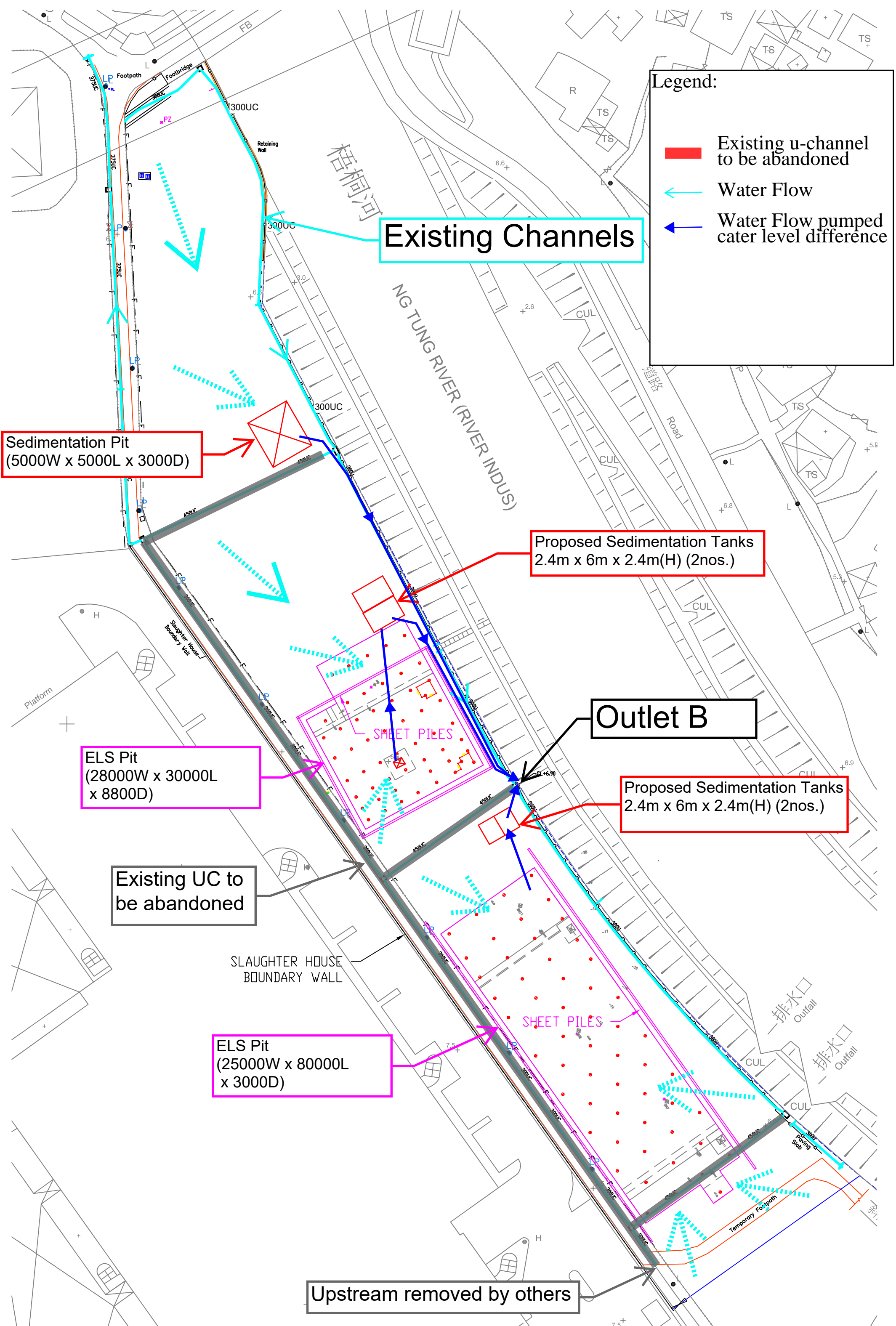
EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the Measures?	Location of the measures	When to implement the Measures?	What requirements or standards for the measures to achieve?
			facilities	Detailed Design Consultant / Contractor / Maintenance Authority	structures	Construction Phase & Maintenance in Operation Phase	Manual for Greening
S.12.9 MM10	LV12	Green Roof – Roof greening where appropriate should be established on proposed buildings as per the guidelines stated. These guidelines provide further details including information regarding structural loading, design, maintenance, etc. considerations as well as providing information on what types of plants might be suitable.	Reduce exposure to untreated concrete surfaces and particularly mitigate visual impact to VSRs at high levels. Provide greening.	Project Proponent / Detailed Design Consultant / Contractor / Maintenance Authority	On appropriate buildings	Prior to Construction, Construction Phase & Maintenance in Operation Phase	CIBSE HK Branch, Technical Guidelines for Green Roof Systems in Hong Kong (2011); ArchSD/Urbis Study on Green Roof Application in HK (2007)
S.12.9 MM11	LV13	Screen Planting – Tall screen/buffer trees and shrubs should be planted. This measure may additionally form part of the compensatory planting.	To screen proposed structures such as roads and buildings. Improve compatibility with the surrounding environment and create a pleasant pedestrian environment	Government / Developer / Detailed Design Consultant / Contractor	Along roads, around suitable built structures, or around VSRs to contain their view out to the NDA Maintenance and create a pleasant Contractor structures	Prior to Construction, Construction Phase & Maintenance in Operation Phase	ETWBTC 3/2006
S12.9 MM14.5	LV20	Screen Hoarding – Screen hoarding shall be erected along areas of the construction works site boundary where the works site borders publically accessible routes and/or is close to visually sensitive receivers (VSRs). It is proposed that the screening be compatible with the surrounding environment and where possible, nonreflective, recessive colours be used.  Any works areas near the ecological sensitive areas should erect 2m high dull green site boundary fence. Details can refer to the ecological impact assessment (Chapter 13 of the EIA report).	To screen undesirable views of the works site.	Contractor	Throughout NDAs	Construction Phase	
S12.9	LV21	Light Control – Construction day and night time lighting should be controlled to	To minimize glare	Government /	Throughout	Construction	



EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the Measures?	Location of the measures	When to implement the Measures?	What requirements or standards for the measures to achieve?
MM14.6		minimize glare impact to adjacent VSRs during the Construction phase. Street and night time lighting shall also be controlled to minimize glare impact to adjacent VSRs during the operation phase.	impact to adjacent VSRs	Developer / Contractor	NDA's	and Operation Phases	
<b>Ecology (Construction Phase)</b>							
S.13.9	E13	Review design and construction methods for bridges, especially those on the Sheung Yue and tidal Ng Tung Rivers, and adopt measures which minimize impacts on rivers and disturbance and fragmentation impacts on fauna. No construction during ardeid breeding season (1 March to 31 July) along Sheung Yue River north and east of KTN area D1-5 and east of D1-9 and C2-3 and restriction of working hours on new pedestrian bridges over the Sheung Yue River and tidal Ng Tung River to 09.00 to 17.30 during the ardeid breeding season (1 March to 31 July). Provision of alternative foraging habitat along main river channels for large waterbirds.	Minimize impacts on rivers and disturbance and fragmentation impacts on fauna.	Project Proponent / Detailed Design Consultant / Contractor	Along and within the Sheung Yue, Ng Tung and Shek Sheung Rivers	Detailed design and construction phases.	TM-EIAO.
S.13.9	E16	Creation of Green Corridors along the Sheung Yue, Ng Tung and Shek Sheung Rivers, retention and provision of screen plantings where feasible; provision of Open Space areas and development areas along river corridors; Design and erection of 2m high solid dull green site barrier fence between river channel and any active works area along or adjacent to Ng Tung, Sheung Yue and Shek Sheung Rivers. Ng Tung, Sheung Yue and Shek Sheung Rivers screen planting.	Minimize disturbance to waterbirds using Ng Tung, Sheung Yue and Shek Sheung River channels.	Detailed Design Consultant / Contractor	Ng Tung, Sheung Yue and Shek Sheung Rivers	Detailed design and construction phases.	TM-EIAO.
S.13.9	E19	Use opaque, non-transparent, non-reflective noise barriers for all construction sites. Unnecessary lighting should be avoided.	Minimize mortality impacts on birds.	Contractor	All construction sites	Construction phase.	TM-EIAO.

## **Appendix K**

### **Site Temporary Drainage Plan in the Reporting Period**



## **Appendix L**

### **Waterbirds Survey Report for the Reporting Month**



**WSD Contract No. 3/WSD/20 - Reclaimed Water Supply to  
Sheung Shui and Fanling - Provision of EM&A (Ecological)  
Monitoring**

**Monthly Report for September 2022  
(Issue 1)**


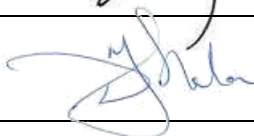
Job Ref.: 21/2063/582 AUES-SWHTSE  
Date: 7<sup>th</sup> October 2022

## **WSD Contract No. 3/WSD/20 - Reclaimed Water Supply to Sheung Shui and Fanling - Provision of EM&A (Ecological) Monitoring**

Monthly Report for September 2022

(Issue 1)

October 2022

	Name	Signature
Prepared by:	<b>Nicholas Tam</b>	
Reviewed by:	<b>David Stanton</b>	
Date:	<b>7<sup>th</sup> October 2022</b>	



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## 1 INTRODUCTION

- 1.1 According to Section 12.3.2.5 of “Updated EM&A Manual for Advance And First Stage Works of Kwu Tung North and Fanling North New Development Areas”, monitor of measures to minimise disturbance to waterbirds on Ng Tung, Sheung Tue and Shek Sheung Rivers is required.
- 1.2 aec Ltd. has been appointed by Action-United Environmental Services & Consulting (AUES) to conduct weekly transect bird surveys at high and low tides along Ng Tung River, Sheung Yue River and Shek Sheung River; and identify sources of actual and potential disturbances to birds due to construction activities of WSD Contract No. 3/WSD/20 – Reclaimed Water Supply to Sheung Shui and Fanling. As instructed by the Contractor, the commencement date of the survey was in the week of 10<sup>th</sup> January 2022. This monthly report summarises the monitoring findings in September 2022.

## 2 MONITORING METHODOLOGY

- 2.1 The survey methodology references the methodology stated in approved Baseline Monitoring Report (Ecology) (Version 1) (prepared by Cinotech Consultants Limited (2019)) under “Contract No. SPW 08/2019 – Shek Wu Hui Effluent Polishing Plant – Main Works Stage 1”. Three transects and seven point count locations were selected within the 500m boundary of Ng Tung, Sheung Yue and Shek Sheung River. These locations are shown in **Figure 1** and summarized in **Table 1**.

**Table 1** Ecological Monitoring Stations

Monitoring Stations	Descriptions	Influenced by Tidal Action
Transect T1	Along Ng Tung River	No
Transect T2		
Point Count Location P1		
Point Count Location P2		
Point Count Location P3		
Point Count Location P4		
Point Count Location P5	At Shek Sheung River (Low-flow Channel)	No
Transect T3	Along Shek Sheung River & Sheung Yue River	Yes
Point Count Location P6	At Shek Sheung River	Yes
Point Count Location P7	At Intersection between Sheung Yue and Shek Sheung River	Yes

- 2.2 Surveys were conducted on a weekly basis at both high and low tides (it is considered high tide when tidal levels are above 1.5m and low tide when tidal level are below 1.5m at Tsim Bei Tsui Station).
- 2.3 All avifauna species that were seen or heard were identified and quantified along transects and at point count locations. Survey data would be recorded continuously by the surveyor as they walk along the transects, while survey data of each point count location would be collected for 5-minutes after surveyor reaches the designated point count location. During the surveys, the utilisation of Ng Tung River, Sheung Yue River and Shek Shui River and their immediate environs/habitats by waterbirds will be focused. For comparison and data analysis, the transect routes and point count locations followed Figure 1 of the approved Baseline Monitoring Report (Ecology) (Version 1). Locations of T1, T2, and P1 to P4 were adjusted to the opposite side of Ng Tung River as the original transects were inaccessible due to various construction projects.

- 2.4 Noticeable behaviours such as breeding, nesting, roosting, feeding and presence of recently fledged juveniles were recorded and reported. In the case which such behaviours were observed for species of conservation importance, the Resident Engineer (RE), the Contractor and the Independent Environmental Checker (IEC) would be immediately notified after the survey such that the Contractor could review the current construction programme and minimize disturbances due to construction activities.
- 2.5 Weather conditions, tidal information, time of the survey and other noticeable activities occurring within the vicinity of the survey area were recorded.

### 3 ANALYTICAL METHODOLOGY

- 3.1 Total number of waterbirds and six representative waterbird species (listed in **Table 2**) are used as an indicator of the level disturbance to waterbirds at each of the survey location. Species listed as wetland-dependant according to Carey *et al.* (2001) are defined as waterbirds. A significant decline in the abundance of all or representative waterbirds would indicate a high level of disturbance.

**Table 2** Representative Waterbirds

Common Name	Species Name	Chinese Name
Chinese Pond Heron	<i>Ardeola bacchus</i>	池鷺
Eastern Cattle Egret	<i>Bubulcus coromandus</i>	牛背鷺
Grey Heron	<i>Ardea cinerea</i>	蒼鷺
Great Egret	<i>Ardea alba</i>	大白鷺
Little Egret	<i>Egretta garzetta</i>	小白鷺
Great Cormorant	<i>Phalacrocorax carbo</i>	普通鸕鶿

- 3.2 Survey data from each month is compared to the baseline monitoring data. When a decline in the total number of Waterbirds or the number of the representative Waterbird species is recorded the survey data would be compared to the baseline data (from Shek Wu Hui Effluent Polishing Plant Baseline Monitoring Report (Ecology) by Cinotech Consultants Limited, 2019) using a two-sample one-tailed Student's t-test assuming unequal variance to analyse whether the decline is significant.
- 3.3 If the collected data for the reporting month shows a significant difference at the 95% confidence level, the action level will be triggered. If the collected data for the reporting month shows a significant difference at the 99% confidence level, the limit level is triggered and corresponding suggestions would be given to minimize the disturbances according to **Table 3**.

**Table 3** Action and Limit Levels and Responses to Evidence of Disturbance to Waterbirds using Ng Tung, Sheung Yue and Shek Sheung Rivers during Construction Phase

Action Level	Response	Limit Level	Response
Decline in numbers of all waterbird species relative to numbers during Baseline Monitoring such that the Action Level response is triggered.	Investigate cause(s) and if cause(s) identified as related to NDAs project instigate remedial action to remove or reduce source of disturbance.	Decline in numbers of all waterbird species relative to numbers during Baseline Monitoring such that the Limit Level response is triggered.	Investigate cause(s) and if cause(s) identified as related to the NDAs project instigate remedial action. Review and adjust project's Long Valley Nature Park (LVNP) management measures

Action Level	Response	Limit Level	Response
			to improve conditions for affected species.
Decline in numbers of any one Waterbird species occurring in significant numbers* during Baseline Monitoring such that the Action Level response is triggered.	Investigate cause(s) and if cause(s) identified as related to NDAs project instigate remedial action to remove or reduce source of disturbance.	Decline in numbers of any one Waterbird species occurring in significant numbers* during Baseline Monitoring such that the Limit Level response is triggered.	Investigate cause(s) and if cause(s) identified as related to the NDAs project instigate remedial action. Review and adjust project's LVNP management measures to improve conditions for affected species.

Note: Whether numbers are significant depend on species and season after collection and evaluation of baseline survey data.

- 3.4 In order to increase the sample size and reduce the random error on each survey day, survey data would be collectively analysed on a monthly basis. The collective data of each month is also compared to the baseline data of the respective month and season instead of the entire data set, to account for the seasonal variation in the abundance of waterbirds. In this study, the Winter season is defined as October to March, while the Summer season is defined as April to September.

## 4 RESULTS

- 4.1 The weather conditions and tide levels on the survey dates are listed in the table below.

**Table 4** Weather Conditions and Tidal Information of Survey Dates in the Reporting Month

High Tide				Low Tide			
Date	Time	Tide (m)	Weather	Date	Time	Tide (m)	Weather
5-Sep-22	6:30	2.1	Sunny	6-Sep-22	9:30	1.5	Sunny
14-Sep-22	11:30	2.15	Sunny	15-Sep-22	8:00	0.67	Sunny
20-Sep-22	7:00	2	Sunny	21-Sep-22	10:30	1.5	Sunny
28-Sep-22	9:30	1.83	Sunny	26-Sep-22	14:30	1.5	Sunny

- 4.2 Abundance and diversity of total bird species and key species are summarized in **Tables 5** and **6** respectively. Detailed list of avifauna recorded is provided in **Appendix A**.

**Table 5** Total Bird Species and Abundance at Point Count Locations in the Reporting Month

Category	Number of Species	Abundance
All Avifauna	35	583
Waterbirds	12	189

**Table 6** Abundance of Representative Waterbirds at Point Count Locations in the Reporting Month

Common Name	Species Name	Chinese Name	Abundance
Chinese Pond Heron	<i>Ardeola bacchus</i>	池鷺	35
Eastern Cattle Egret	<i>Bubulcus coromandus</i>	牛背鷺	19
Grey Heron	<i>Ardea cinerea</i>	蒼鷺	13
Great Egret	<i>Ardea alba</i>	大白鷺	19
Little Egret	<i>Egretta garzetta</i>	小白鷺	46
Great Cormorant	<i>Phalacrocorax carbo</i>	普通鸕鶿	0

## 5 ANALYSIS

- 5.1 The results of Student's t-test for all waterbirds and representative waterbirds are compiled in **Table 7** respectively. Further details are provided in **Appendices B** and **C**.

**Table 7** T-test Result for Waterbirds in the Reporting Month

Category	Monthly					Seasonal				
	T-value	df	p	Action Level	Limit Level	T-value	df	p	Action Level	Limit Level
All Waterbirds	No decline					No decline				
Chinese Pond Heron	-1.072	6	0.163			-2.088	3	0.064		
Eastern Cattle Egret	No decline					No decline				
Grey Heron	-0.869	6	0.209			No decline				
Great Egret	-0.156	5	0.441			No decline				
Little Egret	-1.234	6	0.132			-4.292	4	0.006	*	*
Great Cormorant	No decline					No decline				

\* = level triggered

- 5.2 Decline in Little Egrets have triggered the action level and the limit level in comparison to the seasonal averages.
- 5.3 Similar to the account in the report of previous months, in addition to the birds recorded from the point count, another 39 Little Egrets have been recorded from the transect count in this reporting month, showing that a considerable number of Little Egrets are still present within the survey area, and are simply excluded from the analysis.
- 5.4 Additionally, as suggested in previous reporting months, the change in habitats of Long Valley Nature Park (e.g. maintenance of shallow water in the reprofiled agricultural land or low-lying areas) is likely to attract more birds to be active within LVNP instead of the Study Area. In addition, the tidal influence of the Rivers may restrict the availability of foraging and roosting sites for the waterbirds. This may further encourage the waterbirds utilising the more attractive habitats in the nearby LVNP.
- 5.5 Given that the anthropogenic activities recorded were similar to the previous month, and no large instances of disturbance (only use of crane and scaffolding works) caused by the construction works of the project were recorded by the surveyor, it is suggested that the decline in the number of Little Egrets is not related to the construction works.
- 5.6 Monitoring work will be continued next month to evaluate any construction impact on waterbirds. The construction site should continue keeping the best site practice in noise control to minimize disturbance caused to waterbirds. No further action is advised at the moment.

## 6 OBSERVATIONS

- 6.1 The types of Waterbird behavior observed during ecological monitoring are listed below:
- Flying
  - Resting
  - Foraging
- 6.2 The anthropogenic activities observed during ecological monitoring are listed in **Table 8**.

**Table 8** Observations of the anthropogenic activities during the Ecological Monitoring in the Reporting Month

Location	Observations	
	Project Related	Non-project Related
T1 (PC1, PC2)	/	Fishing
T2 (PC3, PC4)	Use of crane, scaffolding	Fishing
T3 (PC6, PC7)	/	Fishing

## 7 REFERENCES

Carey, G.J., Chalmers, M.L., Diskin, D.A., Kennerley, P.R., Leader, P.J., Leven, M.R., Lewthwaite, R.W., Melville, D.S., Turnbull, M., and Young, L. 2001. The Avifauna of Hong Kong. Hong Kong Bird Watching Society, Hong Kong.

Cinotech Consultants Limited. 2019. Contract No. SPW 08/2019 Shek Wu Hui Effluent Polishing Plant – Main Works Stage 1 Baseline Monitoring Report (Ecology) (Version 1). Accessed from [https://shekwuhui.cinotech.hk/?page\\_id=24](https://shekwuhui.cinotech.hk/?page_id=24) in Jan 2022.



## Appendix A Recorded Bird Species and their Abundance in the Reporting Month

Common Name	Chinese Name	Scientific Name	Waterbird	Point Count Abundance	Transect Abundance
Chinese Pond Heron	池鷺	<i>Ardeola bacchus</i>	Y	35	++++
Eastern Cattle Egret	牛背鷺	<i>Bubulcus coromandus</i>	Y	19	++
Grey Heron	蒼鷺	<i>Ardea cinerea</i>	Y	13	++
Great Egret	大白鷺	<i>Ardea alba</i>	Y	19	+++
Little Egret	小白鷺	<i>Egretta garzetta</i>	Y	46	++++
Black Kite	黑鵟	<i>Milvus migrans</i>	N	1	+
White-breasted Waterhen	白胸苦惡鳥	<i>Amaurornis phoenicurus</i>	Y	2	+
Black-winged Stilt	黑翅長腳鷸	<i>Himantopus himantopus</i>	Y	41	+
Pintail Snipe	針尾沙錐	<i>Gallinago stenura</i>	Y	1	
Common Snipe	扇尾沙錐	<i>Gallinago gallinago</i>	Y		+
Common Sandpiper	磯鷸	<i>Actitis hypoleucos</i>	Y	10	+
Green Sandpiper	白腰草鷸	<i>Tringa ochropus</i>	Y		+
Common Greenshank	青腳鷸	<i>Tringa nebularia</i>	Y	1	+
Spotted Dove	珠頸斑鳩	<i>Spilopelia chinensis</i>	N	49	+++
Greater Coucal	褐翅鴉鵂	<i>Centropus sinensis</i>	N	1	
Asian Koel	噪鵲	<i>Eudynamis scolopaceus</i>	N	3	
White-throated Kingfisher	白胸翡翠	<i>Halcyon smyrnensis</i>	Y	1	+
Common Kingfisher	普通翠鳥	<i>Alcedo atthis</i>	Y	1	+
Pied Kingfisher	斑魚狗	<i>Ceryle rudis</i>	Y		+
Long-tailed Shrike	棕背伯勞	<i>Lanius schach</i>	N	1	
Black Drongo	黑卷尾	<i>Dicrurus macrocercus</i>	N	3	+
Red-billed Blue Magpie	紅嘴藍鵲	<i>Urocissa erythroryncha</i>	N	2	+
Oriental Magpie	喜鵲	<i>Pica serica</i>	N	2	+
Collared Crow	白頸鴉	<i>Corvus torquatus</i>	Y		+
Large-billed Crow	大嘴烏鴉	<i>Corvus macrorhynchos</i>	N		+
Cinereous Tit	蒼背山雀	<i>Parus cinereus</i>	N	12	++
Red-whiskered Bulbul	紅耳鶇	<i>Pycnonotus jocosus</i>	N	49	+++++
Chinese Bulbul	白頭鶇	<i>Pycnonotus sinensis</i>	N	21	+++
Barn Swallow	家燕	<i>Hirundo rustica</i>	N	9	+
Yellow-browed Warbler	黃眉柳鶯	<i>Phylloscopus inornatus</i>	N	2	+
Yellow-bellied Prinia	黃腹鷦鶯	<i>Prinia flaviventris</i>	N	18	++
Common Tailorbird	長尾縫葉鶯	<i>Orthotomus sutorius</i>	N	26	+++
Masked Laughingthrush	黑臉噪鵲	<i>Pterorhinus perspicillatus</i>	N	18	++
Swinhoe's white-eye	暗綠繡眼鳥	<i>Zosterops simplex</i>	N	50	+++++
Crested Myna	八哥	<i>Acridotheres cristatellus</i>	N	46	+++++
Black-collared Starling	黑領椋鳥	<i>Gracupica nigricollis</i>	N	26	+++++
Oriental Magpie Robin	鵲鴝	<i>Copsychus saularis</i>	N	10	+
Eurasian Tree Sparrow	樹麻雀	<i>Passer montanus</i>	N	20	++
Eastern Yellow Wagtail	東黃鸝鵒	<i>Motacilla tschutschensis</i>	N	6	+
White Wagtail	白鸝鵒	<i>Motacilla alba</i>	N	19	++
Total Point Count Abundance				583	

Common Name	Chinese Name	Scientific Name	Waterbird	Point Count Abundance	Transect Abundance
Total Waterbirds				189	

For transect abundance, +: 1-10, ++: 11-20, +++: 21-30, ++++: 31-40, +++++: >40

## Appendix B Total Waterbird Abundance from Point Count

Survey Information				Number of Waterbirds	
Week	Date	Time	Tide Level	Individuals Recorded	Total
1	5/9/2022	6:30	High	5	14
	6/9/2022	9:30	Low	9	
2	14/9/2022	11:30	High	10	29
	15/9/2022	8:00	Low	19	
3	20/9/2022	7:00	High	26	77
	21/9/2022	10:30	Low	51	
4	26/9/2022	14:30	Low	49	69
	28/9/2022	9:30	High	20	
Survey Average					47.25
Baseline				September Average	43.75
				Summer Average	45.34

**Appendix C** Abundance of Representative Waterbirds from Point Count

Representative Species		Recorded Abundance (Sep 2022)						Baseline	
Common Name	Species Name	Week 1	Week 2	Week 3	Week 4		Average	Sep Average	Summer Average
Chinese Pond Heron	<i>Ardeola bacchus</i>	3	4	18	10		8.75	13.5	16.18
Eastern Cattle Egret	<i>Bubulcus coromandus</i>	0	2	8	9		4.75	0.25	3.32
Grey Heron	<i>Ardea cinerea</i>	0	1	4	8		3.25	5.25	0.55
Great Egret	<i>Ardea alba</i>	2	3	7	7		4.75	5	2.61
Little Egret	<i>Egretta garzetta</i>	6	13	12	15		11.5	15.5	20.53
Great Cormorant	<i>Phalacrocorax carbo</i>	0	0	0	0		0	0	0

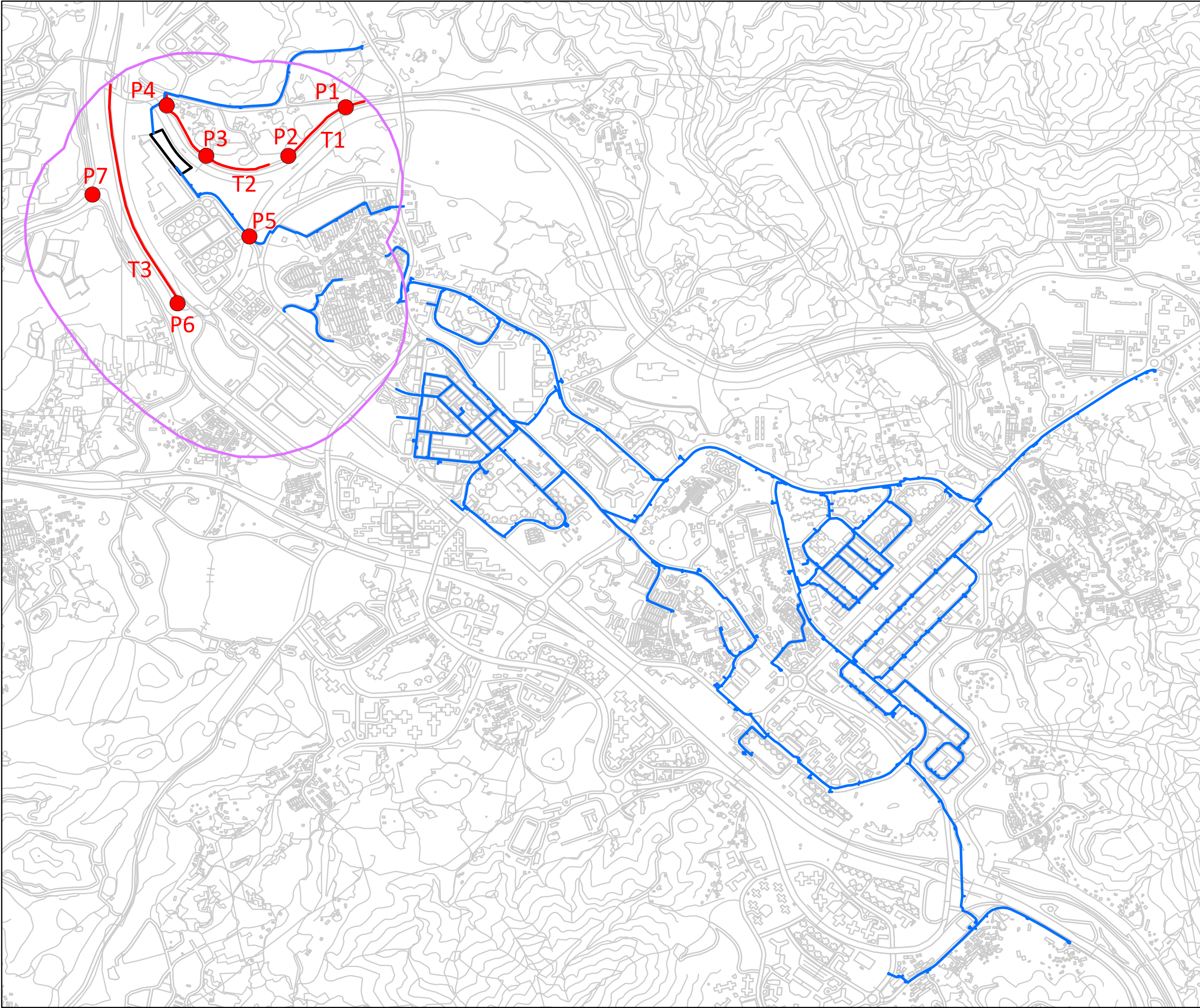
## Appendix D Survey Photos

<p><b>Photo 1</b> Works on current project at P4</p> 	<p><b>Photo 2</b> Fishing Activities at T2</p> 
<p><b>Photo 3</b> Site Condition at P2</p> 	<p><b>Photo 4</b> Great Egret at P2</p> 
<p><b>Photo 5</b> Grey Herons at P7</p> 	<p><b>Photo 6</b> Little Egret at P7</p> 

# **Figure 1**

## **Transect and Point Count Location**





- Proposed Shek Wu Hui Water Reclamation Plant
- 500m Survey Boundary
- Proposed Retained Water Mains
- Walk Transects
- Point Count Locations



Project Title:

WSD Contract No. 3/WSD/20 -  
Reclaimed Water Supply to Sheung Shui and Fanling -  
Provision of EM&A (Ecological) Monitoring

Figure Title:

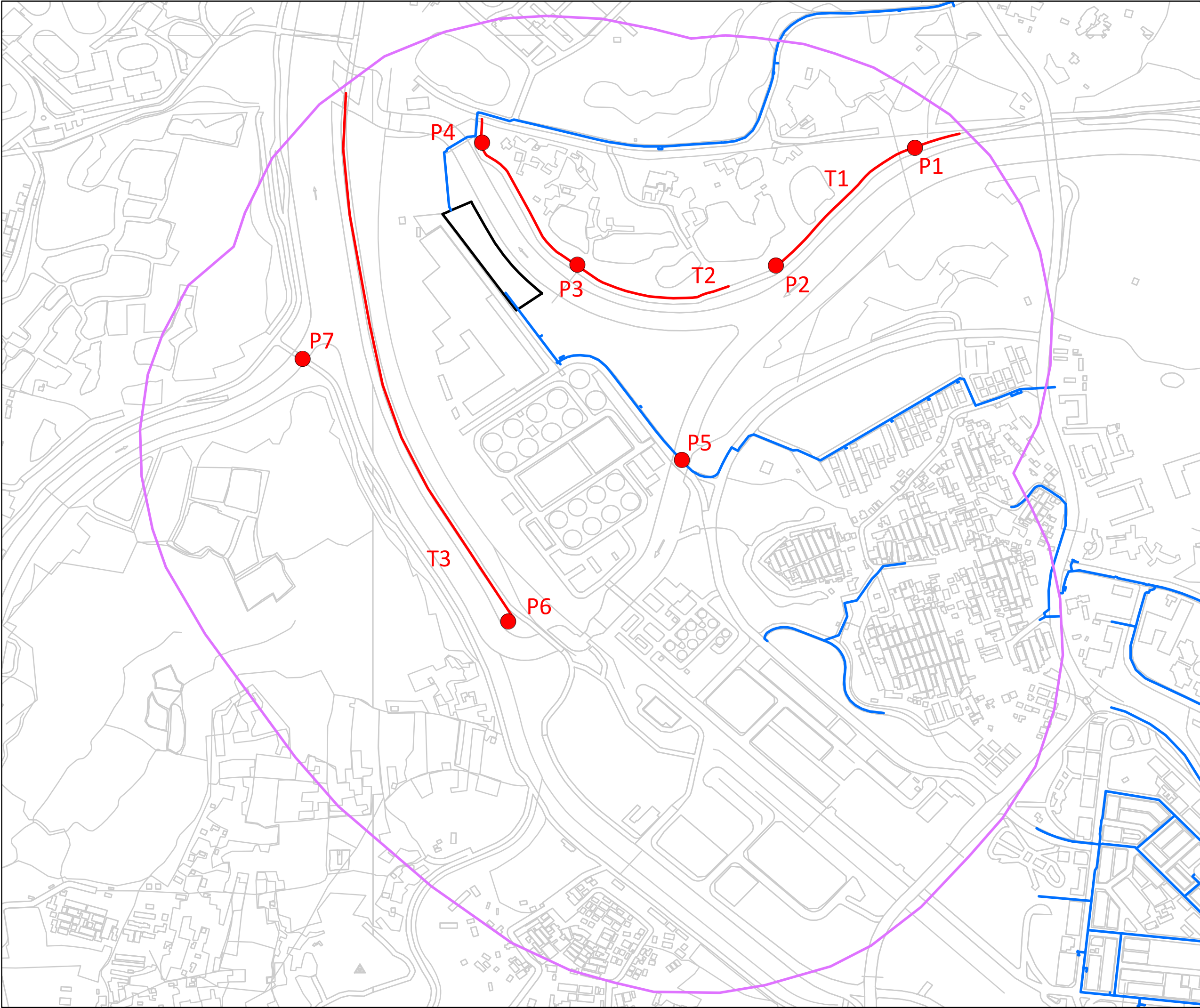
Transect and Point Count Locations

Drawn by:	NT	Scale:	1:14,500	on A3
Checked By:	NT	Date:	5 July 2022	
Approved by:	IV			
Figure Number:	Figure 1			Revision: 2

**Figure 1a**

**Transect and Point Count Location (Zoomed In)**





Proposed Shek Wu Hui Water Reclamation Plant

500m Survey Boundary

Proposed Retained Water Mains

Walk Transect

Point Count Locations

ecology

biodiversity

landscape

aec

Project Title:

WSD Contract No. 3/WSD/20 -  
Reclaimed Water Supply to Sheung Shui and Fanling -  
Provision of EM&A (Ecological) Monitoring

Figure Title:

Transect and Point Count Locations (zoomed in)

Drawn by:

NT

Scale:

1:6,000

on A3

Checked By:

NT

Date:

5 July 2022

Approved by:

IY

Figure Number:

Figure 1a

Revision:

2