



**JOB No.: TCS01216/21**

**UPDATED ENVIRONMENTAL MONITORING AND AUDIT  
MANUAL**

**FOR**

**WSD CONTRACT No.: 3/WSD/20 –  
RECLAIMED WATER SUPPLY TO SHEUNG SHUI AND FANLING**

**PREPARED FOR  
WATER SUPPLIES DEPARTMENT**

Date	Reference No.	Prepared By	Certified By
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Date: 29<sup>th</sup> November 2022

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Water Supplies Department  
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Attn: Mr. Tim Wong

Dear Sir,

**Agreement No. CE67/2017(W.S)**

**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**

**Updated Environmental Monitoring and Audit Manual**

We refer to the Updated Environmental Monitoring and Audit Manual for WSD Contract No.: 3/WSD/20 – Reclaimed Water Supply to Sheung Shui and Fanling certified by the Environmental Team Leader on 30<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 2.3 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

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## 1. INTRODUCTION

### 1.1 PROJECT BACKGROUND AND WORK SCOPE

- 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 was awarded WSD Contract Works 3/WSD/20 - Reclaimed Water Supply to Sheung Shui and Fanling (hereinafter named 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 (Reclaimed Water P/S), 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 Contract Works mainly comprises the construction of Shek Wu Hui Water Reclamation Plant and laying of water mains of diameters ranging from 150 millimetres to 600 millimetres with an approximate total length of 25.3 kilometres. The reclaimed Water Quality Standard for KTN and FLN NDAs is shown in **Table 1.1** and the layout of the Contract Works is shown in **Appendix A**.

**Table 1.1 - Reclaimed Water Quality Standard for KTN and FLN NDAs**

Parameter	Unit	Reclaimed Water Quality Standard for KTN and FLN NDAs
E. coli	cfu/100mL	Not detectable
Total residual chlorine (TRC)	mg/L	≥ 1 (out of treatment system) ≥ 0.2 (at user end)
Dissolved oxygen (DO)	mg/L	≥ 2
Total suspended solids (TSS)	mg/L	≤ 5
Colour	unit	≤ 20
Turbidity	NTU	≤ 5
pH	mg/L	6 - 9
Threshold odour number (TON)	-	≤100
5-day Biochemical oxygen demand (BOD5)	mg/L	≤10
Ammoniacal nitrogen (NH <sub>3</sub> -N)	mg/L as N	≤1
Synthetic detergents	mg/L	≤ 5

- 1.1.7 A brief summary of the construction work of SWHWRP and its associated environmental impacts was provided in **Table 1.2**.

**Table 1.2 – Construction work of SWHWRP and associated environmental impacts**

Construction Work of SWHWRP	Environmental Impacts
Civil engineering construction works including structures, foundations and earthwork for the SHWWRP and ancillary buildings.	Construction dust and construction noise generated from excavation, lateral support and backfilling work during foundation work and construction of building structure; wastewater generation during site investigation work and construction of building structure.
Electrical and mechanical (E&M) work and installation of other associated systems and facilities for the SWHWRP (such as fire services installations, chemical storage and dosing system, and treatment process system engineering work)	Construction waste and chemical waste produced from the E&M work and facilities installation work; construction noise from installation and testing of equipment.

- 1.1.8 As part of the Contract Works, construction of Shek Wu Hui Water Reclamation Plant 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”). Moreover, laying of water mains is non-designated Project to under the Contract Works.

## **1.2 PURPOSE OF THIS MANUAL**

- 1.2.1 Pursuant to the FEP Condition 2.3 stipulation, the Permit Holder shall update EM&A Manual to include the latest EM&A requirements in accordance with the information and recommendations described in the EIA Report and currently approved EM&A Manual and by taking into account any specific site conditions that may be changed before the construction of the Project. At least 4 weeks before the commencement of the designated Project of the Contract Works, 4 hard copies and 4 electronic copies of the Contract Works Specific EM&A Manual shall deposit with the Director of Environmental Protection.
- 1.2.2 This updated EM&A Manual is specific for the Designated Works (i.e., Shek Wu Hui Water Reclamation Plant) under FEP-01/470/2013. The purpose of the updated EM&A Manual to guide the setup of an EM&A programme to assess the effectiveness of the recommended mitigation measures and to identify any further need for additional mitigation measures or remedial action, which outlines the monitoring and audit programme and aims to provide systematic procedures for monitoring, auditing and minimising environmental impacts associated with construction works.
- 1.2.3 This updated EM&A Manual is prepared and developed based on the approved 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*. The purposes of this EM&A Manual are to:
- guide the setup of an EM&A programme to ensure compliance with the EIA recommendations;
  - specify the requirements for monitoring equipment;
  - propose environmental monitoring points, monitoring frequency etc.;
  - propose Action and Limit Level; and
  - propose Event and Action Plan.
- 1.2.4 This Manual contains the following information:
- responsibilities of the Contractor, the Engineer or Engineer’s Representative (ER), Environmental Team (ET), and the Independent Environmental Checker (IEC) under the context of the EM&A;
  - project organization for the EM&A works;
  - the basis for, and description of the broad approach underlying the EM&A programme;
  - details of the methodologies to be adopted, including all laboratories and analytical procedures, and details on quality assurance and quality control programme;
  - the rationale on which the environmental monitoring data will be evaluated and interpreted;
  - definition of Action and Limit levels;
  - establishment of Event and Action plans;
  - requirements for reviewing pollution sources and working procedures required in the event

- of non-compliance with the environmental criteria and complaints; and
- Requirements for presentation of environmental monitoring and audit data and appropriate reporting procedures.

### 1.3 PROPOSED CHANGE TO THE UPDATED EM&A MANUAL

- 1.3.1 The proposed changes to the updated EM&A Manual and justification are summarised in **Table 1.3**.

**Table 1.3 – Proposed Changes to the updated EM&A Manual**

Table 12: Proposed Changes to the Updated EIA/EMP Manual			
Location	Kwu Tung North New Developments Areas (KTN NDA)	Kwu Tung North New Developments Areas (KTN NDA)	Proposed changes and justification
EP/ FEP No.	EP-470/2013	FEP-01/470/2013	
Project	Utilization of Treated Sewage Effluent from Shek Wu Hui Sewage Treatment Works	Reclaimed Water Supply to Sheung Shui and Fanling	
Environmental Monitoring Requirement			
Construction Phase			
Construction Dust Monitoring			No changes
Construction Noise Monitoring	√ (CP-KTN-NMS5)	√ (CP-KTN-NMS5)	No changes
Water Quality Monitoring			No changes
Land Contamination/ Ambient Arsenic Monitoring			No changes
Landfill Gas Monitoring			No changes
Archaeological Monitoring / Action			No changes
Built Heritage Monitoring			No changes
Ecological Monitoring	√	√ (monitoring of measure of minimize disturbance to Waterbirds on Ng Tung and Shek Sheung River sections surrounding the proposed Shek Wu Hui Water Reclamation Plant)	The Designated Works under the WSD project only comprise of construction and operation of Shek Wu Hui Water Reclamation Plant, waterbirds monitoring will carry out at the related sections of river.
Operation Phase			
Water Quality Monitoring			No changes
Post Construction Ecological Monitoring	√	√ (monitoring of measure of minimize disturbance to Waterbirds on Ng Tung and Shek Sheung River sections surrounding the proposed Shek Wu Hui Water Reclamation Plant)	The Designated Works under the WSD project only comprise of construction and operation of Shek Wu Hui Water Reclamation Plant, waterbirds monitoring will carry out at the related sections of river.

## **1.4 PROJECT ORGANIZATION**

- 1.4.1 The proposed project organization and lines of communication with respect to environmental protection works are shown in *Appendix B*.
- 1.4.2 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.

### **The Contractor**

- 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**

- 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.

### **Engineer or Engineer's Representative**

- 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.

### **Independent Environmental Checker**

- 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.

## **1.5 CONTENTS OF THE MANUAL**

1.5.1 This EM&A Manual contains the following subsequent sections:-

<b>Section 2</b>	Air Quality
<b>Section 3</b>	Noise
<b>Section 4</b>	Water Quality
<b>Section 5</b>	Sewerage and Sewage Treatment Implications
<b>Section 6</b>	Waste Management
<b>Section 7</b>	Land Contamination
<b>Section 8</b>	Hazard to Life
<b>Section 9</b>	Landfill Gas Hazard
<b>Section 10</b>	Landscape and Visual
<b>Section 11</b>	Cultural heritage
<b>Section 12</b>	Fisheries
<b>Section 13</b>	Ecology
<b>Section 14</b>	Site Environmental Audit
<b>Section 15</b>	Reporting

## **2. AIR QUALITY**

### **2.1 INTRODUCTION**

- 2.1.1 According to approved EIA report of Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation, construction phase air quality impact assessment was conducted for the air sensitive receivers (ASRs) at FLN NDA located near the Project (FLN-E1 to FLN-E13). The predicted cumulative 1-hour and 24-hour TSP concentrations at 1.5 above ground under mitigated scenario at the ASRs for year 2018, 2021 and 2025 were complied the assessment criteria and short-term construction dust impact is not anticipated for this Project with mitigation measures properly implemented.
- 2.1.2 According to the approved EM&A Manual of Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study – Investigation and 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, air quality monitoring location was not proposed and air quality monitoring is considered not required during construction phase for this Project (Utilization of Treated Sewage Effluent from SWHSTW (DP7)).
- 2.1.3 Since there is no significant change on the work scope of the Project and the surrounding environmental condition near the Project site at the time this EM&A Manual was being updated, the conclusions and recommendations regarding the air quality assessment and monitoring for this Project made in the approved EIA report and approved EM&A Manual are still considered valid.
- 2.1.4 Given the nature and scale of the construction works of Shek Wu Hui Water Reclamation Plant (SWHWRP), regular site inspection and audit shall be implemented by the ET to check that the mitigation measures are properly implemented throughout its construction periods.

### **2.2 AIR QUALITY MITIGATION MEASURES**

- 2.2.1 Mitigation measures for dust control have been recommended in 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*, and summarized in this Manual. The Contractor shall be responsible for the design and implementation of these measures. Recommended mitigation measures to minimise the adverse impacts on air quality during construction phases are given in **Appendix E** and detailed in sub-sections below.
- 2.2.2 To ensure compliance with the guideline level and Air Quality Objectives (AQOs) at the ASRs, the Air Pollution Control (Construction Dust) Regulation should be implemented and good site practices should be incorporated in the contract clauses to minimize construction dust impact. A number of below dust suppression measures are proposed to be implemented.
- Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading;
  - Any dusty material remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;
  - A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones;
  - The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle;
  - 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 hardcores;
  - 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.
  - The portion of any road leading only to construction site that is within 30m of a vehicle

- entrance or exit should be kept clear of dusty materials;
- Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously;
- Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet;
- 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;
- Any skip hoist for material transport should be totally enclosed by impervious sheeting;
- Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides;
- Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed;
- Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and
- Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.

### 3. NOISE

#### 3.1 GENERAL

- 3.1.1 The potential noise impacts during the construction phases of the Project have been considered. Construction noise from powered mechanical equipment (PME) would be the key impacts during the construction phases.
- 3.1.2 The requirements, methodology, equipment, monitoring locations, criteria and protocols for the monitoring and audit of noise impacts during the construction phase of the Project are presented in this section.

#### 3.2 NOISE PARAMETERS

- 3.2.1 Construction noise level shall be measured in terms of the A-weighted equivalent continuous sound pressure level (Leq). Leq(30min) shall be used as the monitoring parameter for the time period between 0700 and 1900 hours on normal weekdays. For all other time periods, Leq (5min) shall be employed for comparison with the Noise Control Ordinance (NCO) criteria.
- 3.2.2 Supplementary information for data auditing and statistical results such as L<sub>10</sub> and L<sub>90</sub> should also be obtained for reference. Sample noise field data sheets are shown in **Appendix C** of this Manual for reference. The ET Leader may modify the data record sheet for the Project and should be agreed by the Supervisor.

#### 3.3 NOISE MONITORING EQUIPMENT

- 3.3.1 As referred to in the Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO), sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. Immediately prior to and following each noise measurement the accuracy of the sound level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements shall be accepted as valid only if the calibration level from before and after the noise measurement agrees to within 1.0 dB.
- 3.3.2 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.
- 3.3.3 The ET is responsible for the provision of the monitoring equipment. He shall ensure that sufficient noise measuring equipment and associated instrumentation are available for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. All the equipment and associated instrumentation shall be clearly labelled.

#### 3.4 DESIGNATED NOISE MONITORING LOCATION OF THE UPDATED EM&A MANUAL

- 3.4.1 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 to perform construction noise monitoring. The recommended noise monitoring locations are shown in **Appendix D** and summarised in **Table 3.1** below.

**Table 3.1 Recommended Construction Noise Monitoring Stations**

New Monitoring Station ID	Monitoring Station ID	NSR ID in EIA	Situation	Description
CP-KTN-NMS5	CP-NMS7	A1-2 (R8508)	Planned	Scattered Village Houses near Fu Tei Au Road
CP-FLN-NMS1	CP-NMS10	FN-31 (R4421)	Existing	Belair Monte
CP-FLN-NMS2	CP-NMS11	FS-11 (R8509)	Existing	Scattered Village Houses in Tong Hang
CP-FLN-NMS3	CP-NMS12	D3-11 (R8602)	Planned	Secondary School

### **3.5 THE DESIGNATED NOISE MONITORING LOCATION PROPOSE TO UNDER THE WSD CONTRACT WORKS**

- 3.5.1 According to the geographic location of proposed Shek Wu Hui Water Reclamation Plant and all the recommended designated construction noise monitoring stations, only designated noise monitoring station CP-KTN-NMS5 (prior named “CP-NMS7”) located nearby the proposed Shek Wu Hui Water Reclamation Plant, which within 300m distance (about 110m distance).
- 3.5.2 Therefore, the designated NSR CP-KTN-NMS5 is recommended for the WSD Contract Works to undertake construction noise monitoring. The status and locations of noise sensitive receiver (NSR) may change or planned NSRs closer to the Project are occupied after issuing this Manual. If such cases exist, the ET shall propose alternative monitoring locations/additional monitoring locations and seek approval from the Supervisor of the proposal. When alternative/new monitoring locations are proposed, the monitoring locations 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.
- 3.5.3 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 stations that are chosen, the baseline monitoring and the impact monitoring shall be carried out at the same positions.
- 3.5.4 The ET may, depending on site conditions and monitoring results, decide whether additional monitoring locations shall be included or any monitoring locations could be removed / relocated during any stage of the construction phase.

### **3.6 ENVIRONMENTAL MONITORING PROGRAMME**

#### **Baseline Monitoring**

- 3.6.1 Baseline noise monitoring shall be carried out prior to the commencement of the construction works. There shall not be any construction activities in the vicinity of the stations during the baseline monitoring. Baseline noise monitoring for the A-weighted levels  $L_{eq}$ ,  $L_{10}$  and  $L_{90}$  shall be carried out daily for a period of at least two weeks. One set of  $L_{eq(30min)}$  noise monitoring result with a sample period of 5 minutes or 30 minutes between 0700 and 1900. A schedule on the baseline monitoring shall be submitted for approval before the monitoring starts.
- 3.6.2 During the baseline monitoring, there shall not be any construction activities in the vicinity of the monitoring stations.
- 3.6.3 In exceptional cases, when insufficient baseline monitoring data or questionable results are obtained, the ET leader shall liaise with the Supervisor to agree on an appropriate set of data to be used as a baseline reference.

#### **Impact Monitoring**

- 3.6.4 During normal construction working hour (0700-1900 Monday to Saturday), monitoring of  $L_{eq(30min)}$  noise levels shall be carried out at the agreed monitoring locations once every week in accordance with the methodology in the TM issued under NCO.
- 3.6.5 In case of non-compliance with the construction noise criteria, more frequent monitoring, as specified in the Event and Action Plan, shall be carried out. This additional monitoring shall be continued until the recorded noise levels are rectified or proved to be irrelevant to the construction activities
- 3.6.6 The monthly schedule of the impact monitoring programme should be drawn up by the ET one

month prior to the commencement of the scheduled construction period. Before commencing impact monitoring, the ET shall inform the IEC of the monitoring programme such that the IEC can conduct on-site audit.

### 3.7 EVENT AND ACTION PLAN

3.7.1 The Action and Limit levels for construction noise are defined in **Table 3.2**. Should non-compliance of the criteria occur, action in accordance with the Action Plan in **Table 3.3** shall be carried out.

**Table 3.2 Action and Limit Levels for Construction Noise**

Time Period <sup>(1)</sup>	Action Level	Limit Level
0700 – 1900 hours on normal weekdays	When one documented complaint is received	75 dB(A) <sup>(2)</sup>

Notes:

- (1) If works are to be carried out during restricted hours, the conditions stipulated in the Construction Noise Permit (CNP) issued by the Noise Control Authority have to be followed.
- (2) 70 dB(A) and 65 dB(A) for schools during normal teaching periods and school examination periods, respectively.

**Table 3.3 Event and Action Plan for Construction Noise**

Event	Action			
	ET	IEC	ER	Contractor
<b>Action Level Exceedance</b>	<ol style="list-style-type: none"> <li>1. Notify the IEC, ER and Contractor;</li> <li>2. Carry out investigation;</li> <li>3. Report the results of investigation to the IEC, ER and Contractor;</li> <li>4. Discuss with the Contractor and formulate remedial measures;</li> <li>5. Increase monitoring frequency to check mitigation effectiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the monitoring data submitted by the ET;</li> <li>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;</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify the Contractor;</li> <li>3. Require the Contractor to propose remedial measures for the analyzed noise problem;</li> <li>4. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to the ER and IEC and copy to the ET;</li> <li>2. Implement noise mitigation proposals.</li> </ol>
<b>Limit Level Exceedance</b>	<ol style="list-style-type: none"> <li>1. Identify sources.</li> <li>2. Inform IEC, ER, EPD and Contractor;</li> <li>3. Repeat measurements to confirm findings;</li> <li>4. Increase the monitoring frequency;</li> <li>5. Carry out analysis of the Contractor's working procedures with the ER and Contractor to determine possible mitigations to be</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst the ER, ET and Contractor on the potential remedial actions;</li> <li>2. Review the Contractor's remedial action whenever necessary to assure their effectiveness and advise the ER accordingly;</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. Notify the Contractor.</li> <li>3. Require the Contractor to propose remedial measures for the analyzed noise problems;</li> <li>4. Ensure remedial measures are properly implemented;</li> <li>5. If exceedance continues, consider what</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial action to the ER and IEC and copy to the ET within 3 working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Resubmit proposals if problems still</li> </ol>

Event	Action			
	ET	IEC	ER	Contractor
	implemented; 6. Inform IEC, ER, EPD and Contractor the causes and 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.		portion of work is responsible and instruct the Contractor to stop that portion of works until the exceedance is abated.	not under control; stop the relevant portion of works as determined by the ER until the exceedance is abated.

### 3.8 MITIGATION MEASURES

3.8.1 The implementation schedule of the relevant mitigation measures is presented in *Appendix E*.

3.8.2 To alleviate the construction noise impact on the affected NSRs, the following mitigation measures were proposed in the EIA Report for the Project:

- Use of movable barrier, enclosure, acoustic mat and quiet plant; and
- Wooden framed barrier with a small-cantilevered upper portion of superficial density not less than 14kg/m<sup>2</sup> on a skid footing with 25mm thick internal sound absorptive lining.

3.8.3 In addition, the good site practices should be adopted by the Contractor to further ameliorate the noise impacts.

- Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program;
- Silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction program;
- Mobile plant, if any, should be sited as far away from NSRs as possible and practicable;
- Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum;
- Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and
- Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities.

3.8.4 If the above measures are not sufficient to restore the construction noise quality to acceptable levels upon the advice of ET Leader, the Contractor shall liaise with the ET Leader to identify further mitigation measures. They shall be proposed to IEC and the Engineer for approval, and the Contractor shall then implement these additional mitigation measures.

### 3.9 FIXED NOISE MEASUREMENT

3.9.1 Fixed noise commissioning test shall be carried out at fixed noise sources of Shek Wu Hui Water Reclamation Plant to determine the maximum allowable sound power level as stated in the EIA report. The SWL criteria shall be implemented by Contractor before operation of the Project, in order to ensure of the compliance of the operational airborne noise levels with the TM's stipulated noise standard.

3.9.2 The ET should prepare and deposit to EPD, at least 6 months before the operation of the Project, a commissioning test for the purpose of fixed noise. The commissioning should contain locations,

measurement schedules, methodology of noise measurement including noise measurement procedures and data analysis of measured noise level. The commissioning test should be certified by the ET Leader before deposit with EPD.

## **4. WATER QUALITY**

### **4.1 INTRODUCTION**

- 4.1.1 According to the approved EIA Report of Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation, two sources of water pollution were identified during construction phase of designated projects under KTN NDA and FLN NDA: construction site runoff and potential water quality impact due to alternation of natural streams. Since there is no construction work associated with alternation of natural streams under this Project, construction site runoff will be the only potential water quality impact arise from this Project.
- 4.1.2 However, it is considered in the approved EIA report that the water pollution from construction site runoff will only occur if the materials enter into water bodies as surface runoff or underground storm water / drainage discharge. Therefore no adverse impact is anticipated with full implementation of mitigation measures.
- 4.1.3 According to the approved EM&A Manual of Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study – Investigation and 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, water quality monitoring locations were only proposed for designated project KTN NDA Road D1 to D5 (New Road) (DP 4) of KTN NDA and Fanling Bypass Eastern Section (New Road) (DP10) of FLN NDA where channel construction is required. Water quality monitoring was not proposed and is not required for this Project (Utilization of Treated Sewage Effluent from SWHSTW (DP7)) as no channel construction work will be involved.
- 4.1.4 Since there is no significant change on the work scope of the Project and the surrounding environmental condition at the time this EM&A Manual was being updated, the conclusions and recommendations regarding the water quality assessment and monitoring for this Project made in the approved EIA report and approved EM&A Manual are still considered valid.
- 4.1.5 The implementation of good construction works practice and adequate mitigation measures are important to prevent water pollution in the construction phase and regular site audit is recommended. Mitigation measures as proposed in the EIA Report shall implement during construction periods. The ET shall regular carry out site inspection to check the mitigation measures are properly implemented throughout construction periods.

### **4.2 MITIGATION MEASURES**

- 4.2.1 The implementation schedule of the relevant mitigation measures is presented in *Appendix E*.
- 4.2.2 Mitigation measures for water quality are summarised below. With the implementation of the appropriate mitigation measures, the potential to cause adverse water quality impact would be minimised.

#### Construction Site Runoff

- 4.2.3 Practices and measures provided in the Practice Note for Professional Persons on Construction Site Drainage, (PROPECC PN1/94) should be followed where applicable. Temporary Drainage Management Plan of the Project prepared by the Contractor and approved by ER should be strictly followed to avoid any surface runoff entering the water bodies nearby.

#### Sewage from Workforce

- 4.2.4 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.
- 4.2.5 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 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.

- 4.2.6 For any wastewater discharged from the construction works area, a valid discharge licence shall be obtained from EPD prior to the discharge of effluent from the Project. The monitoring frequency and parameters specified in the discharge license shall be fully followed during monitoring.

Construction Site Audits

- 4.2.7 Implementation of regular site audits is to ensure that the recommended mitigation measures are to be properly undertaken during construction phase of the Project. It can also provide an effective control of any malpractices and therefore achieve continual improvement of environmental performance on site.
- 4.2.8 Site audits should include site inspections and compliance audits.

Site Inspections

- 4.2.9 Site inspections should be carried out by the ET and should be based on the good construction works practice for water pollution control. In the event that the recommended mitigation measures are not fully or properly implemented, deficiency should be recorded and reported to the site management. Suitable actions are to be carried out to:
- investigate the problems and the causes;
  - issue action notes to the Contractor which is responsible for the works;
  - implement remedial and corrective actions immediately;
  - re-inspect the site conditions upon completion of the remedial and corrective actions; and
  - record the event and discuss with the Contractor for preventive actions.

Compliance Audits

- 4.2.10 Compliance audits are to be undertaken to ensure that a valid discharge licence has been issued by EPD prior to the discharge of effluent from the Project site. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the Water Pollution Control Ordinance (WPCO) license which is under the ambit of regional office (RO) of EPD. The audit results reflect whether the effluent quality is in compliance with the discharge licence requirements. In case of non-compliance, suitable actions should be undertaken to:
- notify the site management for the non-compliance;
  - identify the sources of pollution;
  - check the implementation status of the recommended mitigation measures;
  - investigate the operating conditions of the on-site treatment systems;
  - implement corrective and remedial actions to improve the effluent quality;
  - increase monitoring frequency until the effluent quality is in compliance with the discharge licence requirements; and
  - record the non-compliance and propose preventive measures.

## **5. SEWERAGE AND SEWAGE TREATMENT IMPLICATIONS**

### **5.1 INTRODUCTION**

- 5.1.1 An assessment of potential impacts due to the sewage arising from the proposed Project has been assessed in Section 6 of the EIA Report.

### **5.2 SEWERAGE AND SEWAGE TREATMENT IMPLICATIONS DURING CONSTRUCTION PHASE**

- 5.2.1 The sewage generated during the construction stage from the on-site workers will be collected in chemical toilets and disposed of off-site. Therefore, no sewerage impacts are expected from the site during the construction phase. As such, environmental monitoring and audit of the sewerage system is considered not required.

### **5.3 MITIGATION MEASURES**

- 5.3.1 The implementation schedule of the relevant mitigation measures is presented in *Appendix E*.

## **6. WASTE MANAGEMENT**

### **6.1 INTRODUCTION**

6.1.1 Waste management would be the contractor's responsibility to ensure that all wastes produced during the construction works for the Project are handled, stored and disposed of in accordance with good waste management practices, EPD's regulations and requirements.

6.1.2 Waste materials generated during construction activities, such as construction and demolition (C&D) materials and general refuse, are recommended to be audited at regular intervals (at least quarterly) to ensure that proper storage, transportation and disposal practices are being implemented. This monitoring of waste management practices would ensure that these solid wastes generated during construction are not disposed into the nearby coastal waters. The Contractor would be responsible for the implementation of any mitigation measures to minimise waste or redress problems arising from the waste materials. An environmental management plan (EMP) should be prepared by the Contractor and submitted to the Supervisor for approval. The monitoring and auditing requirements of the EMP should be followed with regard to the management of C&D material.

### **6.2 MITIGATION MEASURES**

6.2.1 The implementation schedule of the relevant mitigation measures is presented in *Appendix E*.

#### General

6.2.2 Mitigation measures for waste management are summarised below. With the appropriate handling, storage and removal of waste arisings during the construction works as defined below, the potential to cause adverse environmental impacts would be minimised.

#### Good Site Practices

6.2.3 Adverse impacts related to waste management are not expected to arise, provided that good site practices are strictly followed. Recommendations for good site practices during the construction activities include:

- Nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site;
- Training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling;
- Provision of sufficient waste disposal points and regular collection for disposal;
- Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;
- Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors;
- EMP should be prepared by the Contractor and submitted to the Supervisor for approval.

#### Waste Reduction Measures

6.2.4 Adverse impacts related to waste management are not expected to arise, provided that good site practices are strictly followed. Recommendations for good site practices during the construction activities include:

- Segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal;
- Proper storage and site practices to minimize the potential for damage and contamination of construction materials;
- Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste;
- Sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.);
- Provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling.

- 6.2.5 Good management and control can prevent the generation of a significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:

Storage, Collection and Transportation of Waste

- 6.2.6 In addition to the above measures, specific mitigation measures are recommended below for any temporary storage or stockpiling of waste. The mitigation measures on handling and storing these wastes should be implemented to minimize the impacts:
- Waste such as soil should be handled and stored well to ensure secure containment;
  - Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and
  - Different locations should be designated to stockpile each material to enhance reuse.
- 6.2.7 The collection and transportation of waste from works area to respective disposal sites may also induce adverse environmental impacts if not properly managed. The following recommendation should be implemented to minimize the impacts:
- Remove waste in timely manner;
  - Employ the trucks with cover or enclosed containers for waste transportation;
  - Obtain relevant waste disposal permits from the appropriate authorities; and
  - Disposal of waste should be done at licensed waste disposal facilities.

Handling of Excavated and C&D Materials, Chemical Waste and Materials Generated during Construction Phase

- 6.2.8 In addition to the above measures, other specific mitigation measures on handling the excavated and C&D materials, chemical waste and materials generated during construction phase are recommended in the following subsections.

A. C&D Materials from Site Formation

- 6.2.9 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 C&D materials:
- Maintain temporary stockpiles and reuse excavated fill material for backfilling;
  - Carry out on-site sorting;
  - Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate;
  - Adopt “selective demolition” technique to demolish the existing structure and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; and
  - Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified.

B. C&D Materials from Buildings Demolition and New Building Construction

- 6.2.10 The following mitigation measures should be implemented in handling the C&D materials from building demolition and new building construction:
- The Contractor should recycle as much as possible of the C&D materials on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. For example, concrete and masonry can be crushed and used as fill, and steel reinforcing bar can be used by scrap steel mills. Different areas of the work sites should be designated for such segregation and storage.
  - The use of wooden hoardings shall not be allowed. An alternative material, such as metal, aluminum or alloy etc., could be used.
  - Government has developed a charging policy for the disposal of waste to landfill at present. It will provide additional incentive to reduce the volume of generated waste and ensure proper segregation to allow reuse of the inert material on site when implemented.
  - In order to minimize the impacts of the demolition works, the generated wastes must be cleared as quickly as possible after demolition. Therefore, the demolition and clearance works should be undertaken simultaneously. To facilitate proper segregation of inert and

non-inert C&D material arising from demolition works, selective demolition method should be adopted.

Chemical Waste

- 6.2.11 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 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.

General Refuse

- 6.2.12 General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling. Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to keep areas clean. A reputable waste collector should be employed to remove general refuse on a daily basis. It is expected that such arrangements would minimize potential environmental impacts.

## **7. LAND CONTAMINATION**

### **7.1 GENERAL**

- 7.1.1 The EIA Report has assessed the land contamination associated with the Project. The assessment involved site appraisal, site investigation, assessment of contamination level, and health risk assessment for high natural background of arsenic detected in KTN.
- 7.1.2 Site investigation (SI) works involving sampling and testing of soil and groundwater were conducted at 4 identified government sites (i.e. 3 in KTN and 1 in FLN). No soil and groundwater contamination was detected, except the anomalous high arsenic was detected in all 3 sites in KTN.
- 7.1.3 All other potentially contaminated sites identified in 2 NDAs (include Fanling Bypass) were inaccessible and hence no SI was conducted during the course of this study. Nevertheless, detailed SI for these sites should be conducted when they are resumed and handed over to the Project Proponent (PP).
- 7.1.4 No potentially contaminated site was identified within boundary of Contract Works of WSD, site investigation and soil remediation is therefore not required.

## **8. HAZARD TO LIFE**

### **8.1 GENERAL**

- 8.1.1 According to the Updated EM&A Manual Section 8, part of NDAs development is located inside the 1-km Consultation Zone (CZ) of Sheung Shui Water Treatment Works (SSWTW), which is classified as a Potentially Hazardous Installation (PHI). A hazard to life assessment has been conducted in this EIA study and it is concluded that individual risk and societal risk of SSWTW are acceptable for the proposed NDAs development (both construction stage and operational stage).

### **8.2 MITIGATION MEASURE**

- 8.2.1 Implementation of further risk mitigation measures is not required since the risk level is at the acceptable level.

## **9. LANDFILL GAS HAZARD**

### **9.1 INTRODUCTION**

- 9.1.1 The landfill gas (LFG) hazard assessment undertaken in the EIA Study of potential risk associated with LFG on proposed development in the KTN and FLN NDAs. Ma Tso Lung Landfill (MTLL, close to KTN NDA) is located near the proposed KTN NDA.
- 9.1.2 Since working areas of this Works Contract not located at the designated Landfill, hence landfill gas monitoring and mitigation measures is not required.

## 10. LANDSCAPE AND VISUAL

### 10.1 INTRODUCTION

- 10.1.1 The EIA has recommended landscape and visual mitigation measures to be undertaken during both the construction and operational phases of the project. The design, implementation and maintenance of landscape and visual mitigation measures should be checked to ensure that any potential conflicts between the proposed landscape measures and any other works of the project would be resolved as early as practical without affecting the implementation of the mitigation measures.

### 10.2 MITIGATION MEASURES

- 10.2.1 The proposed mitigation measures for landscape and visual impacts are summarized in the implementation schedule of mitigation measures in **Appendix E**. The landscape and visual mitigation measures proposed should be incorporated in the detailed landscape and engineering design. The construction phase mitigation measures should be adopted as early as possible during construction and should be in place throughout the entire construction period. Mitigation measures for the operational phase should be adopted during the detailed design and be built as part of the construction works so that they are in place on commissioning of the Project.

### 10.3 AUDIT REQUIREMENT

- 10.3.1 Site audits should be undertaken during the construction phase of the Project to check that the proposed landscape and visual mitigation measures are properly implemented and maintained as per their intended objectives.
- 10.3.2 Site inspections should be undertaken by the ET at least once every two weeks during the construction period, preferably by a Registered Landscape Architect (RLA) employed by the Contractor. Particularly audits should be carried out during site clearance when proposed tree felling, and transplantation may occur. For all soft landscaping work, including measures involving trees such as transplantation and compensatory planting, there should be at least a 12 month establishment period which will commence once soft landscaping in an area has been planted.
- 10.3.3 Operational phase auditing will be restricted to the 12 months establishment works of the landscaping proposals, with the appropriate agents taking over the maintenance and monitoring after this period as identified in the EIA Report.
- 10.3.4 The audit of the compensatory planting will also extend during the one year maintenance period, to ensure the establishment of the compensatory planting.
- 10.3.5 In the event of non-compliance, the responsibilities of the relevant parties are detailed in the Event/Action plan provided in **Table 10.1**.

**Table 10.1 Event and Action Plan for Landscape and Visual during Construction Phase**

Event	Action			
	ET	IEC	ER	Contractor
<b>Action Level Exceedance</b>	1. Inform the Contractor; IEC and ER; 2. Discuss remedial actions with IEC, ER and Contractor 3. Monitoring remedial actions until rectification has been completed	1. Check inspection report 2. Check Contractor's working method 3. Discuss with ET, ER and Contractor on possible remedial measures 4. Advise ER on effectiveness of proposed remedial measures	1. Confirm receipt of notification of non-conformity in writing; 2. Review and agree on the remedial measures proposed by the Contractor 3. Supervise implementation of remedial measures	1. Identify source and investigate the non-conformity 2. Implement remedial measures 3. Amended working methods agreed with ER as appropriate 4. Rectify damage and undertake any necessary replacement

Event	Action			
	ET	IEC	ER	Contractor
<b>Limit Level Exceedance</b>	1. Identify source(s) 2. Inform the Contractor, IEC, and ER; 3. Discuss inspection frequency 4. Discuss remedial actions with IEC, ER and Contractor 5. Monitoring remedial actions until rectification has been completed 6. If non-conformity stops, cease additional monitoring.	1. Check inspection report 2. Check Contractor's working method 3. Discuss with ET, ER and Contractor on possible remedial measures 4. Advise ER on effectiveness of proposed remedial measures	1. Notify the Contractor 2. In consultation with the ET and IEC, agree with the Contractor on remedial measures to be implemented 3. Supervise implementation of remedial measures	1. Identify source and investigate the non-conformity 2. Implement remedial measures 3. Amended working methods agreed with ER as appropriate 4. Rectify damage and undertake any necessary replacement. 5. Stop relevant portion of works as determined by ER until the non-conformity is abated.

## **11. CULTURAL HERITAGE**

### **11.1 INTRODUCTION**

11.1.1 In accordance with the recommendations of the EIA, mitigation measures during preconstruction stage and construction stage have been proposed.

11.1.2 Since working areas of this Works Contract not located at the designated cultural heritage, cultural heritage monitoring and mitigation measures is not required.

### **11.2 ARCHAEOLOGY**

11.2.1 Pursuant to the Antiquities and Monuments Ordinance, the construction contractor should inform the AMO immediately in case of discovery of antiquities or supposed antiquities in the course of excavation works in construction stage. Special attention should be given to areas evaluated to have archaeological potential or significance.

## 12. ECOLOGY

### 12.1 INTRODUCTION

- 12.1.1 The ecological impact assessment has evaluated the predicted ecological impacts of the NDAs project and has concluded that ecological impacts can be avoided or reduced to a low and acceptable level with the implementation of appropriate mitigation measures.
- 12.1.2 In situ mitigation measures are required in order to address direct, indirect and fragmentation impacts on habitats of ecological importance and mortality, indirect, and fragmentation impacts on fauna and flora of conservation significance. Habitats of ecological importance include, but are not limited to: Long Valley, the Ng Tung, Sheung Yue and Shek Sheung Rivers, Ma Tso Lung Stream and its tributaries, Siu Hang San Tsuen Stream and Ho Sheung Heung fung shui and secondary woodland and shrubland on Crest Hill.
- 12.1.3 The required measures to mitigate for ecological impacts of the project were identified in Section 13.8 of the EIA Report and are described below. The proposed ecological mitigation measures should be checked as an element of the environmental monitoring and audit program under the project.

### 12.2 MITIGATION MEASURES

- 12.2.1 The Implementation Schedule for these measures is detailed in *Appendix E*. For a number of measures, a more detailed design will be required at a later stage of the project or, in default of this, at the detailed design stage of the relevant element of the project.
- 12.2.2 The mitigation measures for Wetland Habitat Loss and Woodland Habitat Loss are not applicable for the WSD contract works.

### 12.3 MONITORING AND AUDIT REQUIREMENTS

#### Monitoring of Measures to Minimize Disturbance to Waterbirds on Ng Tung, Sheung Yue and Shek Sheung Rivers

- 12.3.1 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 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.
- 12.3.2 A 19-month baseline ecological monitoring for waterbirds was conducted under the DSD Project Agreement No. SPW 07/2019 Shek Wu Hui Effluent Polishing Plant which covered 500m boundary of Ng Tung River, Sheung Yue River and Shek Sheung River of assessment area. Since the baseline ecological monitoring conducted also covered the Project area, the action and limit levels and responses to evidence of disturbance to waterbirds using in Ng Tung, Sheung Yue and Shek Sheung Rivers can be made reference to Shek Wu Hui Effluent Polishing Plant – Baseline Monitoring Report (Ecology) (Version 1).
- 12.3.3 Monitoring should be conducted by the Environmental Team (ET) and supervised by a qualified ecologist who will be a member of the ET.

**Table 12.1 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

Phase	Methodology
	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.

12.3.4 Measures to respond to decrease in numbers of large waterbirds using the river channels and action and limit levels to trigger these measures are detailed in **Table 12.2**. Note that waterbird numbers refer to combined numbers using the channels.

**Table 12.2 Action and Limit Levels and Responses to Evidence of Disturbance to Waterbirds using in Ng Tung, Sheung Yue and Shek Sheung Rivers**

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.
<b>Operational 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 review and adjust LVNP management measures to improve conditions for affected species in LVNP.	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 cause identified as related to NDAs consider and implement additional mitigation measures (e.g. additional screening and screen planting, adjustments to infrastructure design).

Action Level	Response	Limit Level	Response
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 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 Limit Level response is triggered.	Investigate cause and if cause identified as related to NDAs consider and implement additional mitigation measures (e.g. additional screen planting, adjustments to infrastructure design).

### **13. FISHERIES**

#### **13.1 INTRODUCTION**

- 13.1.1 The only potential fisheries impact of significance was the potential loss of a fish fry farm at Fung Kong in KTN NDA. Other than that, the fisheries impact assessment has evaluated the predicted fisheries impact of the NDAs project and concluded that the fisheries impact can be avoided or reduced to a minor and acceptable level with the implementation of mitigation measures.

## **14. SITE INSPECTION AUFIT**

### **14.1 SITE INSPECTIONS**

- 14.1.1 Site inspection provides a direct means to trigger and enforce specified environmental protection and pollution control measures. These shall be undertaken regularly and routinely to inspect construction activities in order to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. The site inspection is one of the most effective tools to enforce the environmental protection requirements at the works area.
- 14.1.2 The ET shall be responsible for formulating the environmental site inspection programme as well as the deficiency and action reporting system, and for carrying out the site inspections. The proposal for rectification, if any, should be prepared and submitted to the ET Leader IEC and the *Engineer* by the *Contractor*.
- 14.1.3 Regular site inspections shall be carried out and led by the Engineer and attended by the Contractor and ET at least once per week during the construction phase. The areas of inspection shall not be limited to the environmental situation, pollution control and mitigation measures within the site. It should also review the environmental conditions of locations outside the works area which is likely to be affected, directly or indirectly, by the construction site activities of the Project. The ET shall make reference to the following information in conducting the inspection. During the inspection, the following information should be referred to:
- Approved EIA Report and EM&A Manual recommendations on environmental protection and pollution control mitigation measures;
  - ongoing results of the EM&A program;
  - works progress and programme;
  - individual works methodology proposals (which shall include proposal on associated pollution control measures);
  - contract specifications on environmental protection;
  - relevant environmental protection and pollution control laws;
  - previous site inspection results undertaken by the ET and others.
- 14.1.4 The Contractor shall keep the Engineer and ET Leader updated with all the relevant environmental related information on the construction contract necessary for him to carry out the site inspections. Site inspection results and associated recommendations for improvements to the environmental protection and pollution control efforts should be recorded and followed up by the Contractor in an agreed time-frame. The Contractor shall follow the procedures and time-frame as stipulated in the environmental site inspection, and the deficiency and action reporting system formulated by the ET, to report on any remedial measures subsequent to the site inspections.
- 14.1.5 The Engineer, IEC, ET and the Contractor shall also carry out ad hoc site inspections if significant environmental problems are identified. Inspections may also be required subsequent to receipt of an environmental complaint, or as part of the investigation work, as specified in the Event and Action Plan for EM&A programme.

### **14.2 COMPLIANCE WITH LEGAL AND CONTRACTUAL REQUIREMENTS**

- 14.2.1 There are contractual environmental protection and pollution control requirements as well as environmental protection and pollution control laws in Hong Kong with which construction activities must comply.
- 14.2.2 In order to ensure the works comply with statutory requirements, all method statements of works should be submitted by the Contractor to the Supervisor for approval and to the ET Leader for vetting to ensure sufficient environmental protection and pollution control measures have been included. Any proposed changes to the mitigation measures shall be certified by the ET Leader and verified by IEC as conforming to the relevant information and recommendations contained in the approved EIA Report and EM&A Manual.
- 14.2.3 The ET Leader shall also review the progress and programme of the works to check that relevant environmental laws have not been violated, and that any foreseeable potential for violating laws

can be prevented.

- 14.2.4 The Contractor should provide the update of the relevant documents to the ET Leader so that checking can be carried out. The document shall at least include the updated Works Progress Reports, updated Works Programme, method statements, any application letters for different licenses / permits under the environmental protection laws, and copies of all valid licenses / permits. The site diary and environmental records shall also be available for inspection by the relevant parties.
- 14.2.5 After reviewing the document, the ET shall advise the Supervisor and the Contractor of any non-compliance with legislative requirements on environmental protection and pollution control so that they can timely take follow-up actions as appropriate. If the follow-up actions still result in potential violation of environmental protection and pollution control requirements, the ET should provide further advice to the Contractor to take remedial action to resolve the problem.
- 14.2.6 Upon receipt of the advice, the Contractor shall undertake immediate action to remedy the situation. The ER shall follow up to ensure that appropriate action has been taken in order to satisfy legal requirements.

### **14.3 ENVIRONMENTAL COMPLAINTS**

- 14.3.1 Complaints received during the construction phase shall be referred to the Contractor for action. The following procedures should be undertaken upon receipt of any environmental complaint:
- (i) The Contractor to log complaint and date of receipt onto the complaint database and inform the ET and the Supervisor immediately;
  - (ii) The Contractor to investigate, with the Engineer, IEC and ET, the complaint to determine its validity, and assess whether the source of the problem is due to construction works of the Project with the support of additional monitoring frequency and stations, if necessary;
  - (iii) The Contractor to identify remedial measures in consultation with the ET and the Engineer if a complaint is valid and due to the construction works of the Project;
  - (iv) The Contractor to implement the remedial measures as required by the Supervisor and to agree with the ET and the Engineer any additional monitoring frequency and stations, where necessary, for checking the effectiveness of the remedial measures;
  - (v) The ET and the Engineer to review the effectiveness of the Contractor's remedial measures and the updated situation;
  - (vi) The ET/Contractor to undertake monitoring and audit to verify the situation if necessary, and oversee that circumstances leading to the complaint do not recur;
  - (vii) If the complaint is referred by the EPD, the Contractor to prepare interim report on the status of the complaint investigation and follow-up actions stipulated above, including the details of the remedial measures and monitoring identified or already taken, for submission to EPD within the time frame assigned by the EPD; and
  - (viii) The ET to record the details of the complaint, results of the investigation, subsequent actions taken to address the complaint and updated situation including the effectiveness of the remedial measures, supported by regular and monitoring results in the monthly EM&A reports.

## **15. REPORTING**

### **15.1 GENERAL**

- 15.1.1 Reports can be provided in an electronic medium upon agreeing the format with the Supervisor. This would enable a transition from a paper / historic and reactive approach to an electronic/real time proactive approach. All the monitoring data shall also be submitted on diskettes or other approved medium. The formats for monitoring data to be submitted shall be separately agreed.
- 15.1.2 Types of reports that the ET Leader shall prepare and submit during construction phase include baseline monitoring report; monthly EM&A report and final EM&A report. A copy of the monthly and final EM&A reports shall be made available to the Supervisor.

### **15.2 BASELINE MONITORING REPORT**

- 15.2.1 The baseline monitoring report shall include, but not be limited to the following:
- (i) Up to half a page executive summary;
  - (ii) Brief project background information;
  - (iii) Drawings showing locations of the baseline monitoring stations;
  - (iv) Monitoring results (in both hard and soft copies) together with the following information:
    - monitoring methodology;
    - name of laboratory and types of equipment used and calibration details;
    - parameters monitored;
    - monitoring locations;
    - monitoring date, time, frequency and duration; and
    - quality assurance (QA) / quality control (QC) results and detection limits.
  - (v) Details on influencing factors, including:
    - major activities, if any, being carried out on the site during the period;
    - weather conditions during the period; and
    - other factors which might affect monitoring results.
  - (vi) Determination of the Action and Limit levels for each monitoring parameter and statistical analysis of the baseline data;
  - (vii) Revisions for inclusion in the EM&A Manual; and
  - (viii) Comments, recommendations and conclusions.
- 15.2.2 The ET should prepare and submit a Baseline Environmental Monitoring Report at least one month before commencement of construction of the Project. Copies of the Baseline Environmental Monitoring Report should be submitted to the IEC verify and EPD endorse. The ET should liaise with the relevant parties on the exact number of copies required.

### **15.3 MONTHLY EM&A REPORTS**

#### **General**

- 15.3.1 The results and findings of all EM&A work required in the Manual shall be recorded in the monthly EM&A reports prepared by the ET and verified by IEC. The EM&A report shall be prepared and submitted to the EPD within 10 working days of the end of each reporting month, with the first report due the month after construction commences.
- 15.3.2 Copies of each monthly EM&A report shall be submitted to the Engineer and WSD. Before submission of the first EM&A report, the ET Leader shall liaise with the parties on the required number of copies and format of the monthly reports in both hard copy and electronic medium.
- 15.3.3 The ET leader shall review the number and location of monitoring stations and parameters every six months, or on as needed basis, in order to cater for any changes in the surrounding environment and the nature of works in progress.

#### **First Monthly EM&A Report**

- 15.3.4 The first monthly EM&A report shall include at least but not be limited to the following:
- (i) Executive summary (1-2 pages):
    - breaches of Action and Limit levels;

- complaint Log;
- notifications of any summons and successful prosecutions;
- reporting Changes; and
- future key issues.
- (ii) Basic Project information:
  - project organisation including key personnel contact names and telephone numbers;
  - programme;
  - management structure, and
  - works undertaken during the month.
- (iii) Environmental Status:
  - advice on the status of statutory environmental compliance and implementation status of mitigation measures;
  - works undertaken during the month with illustrations (such as location of works, daily excavation rates, etc); and
  - drawing showing the project area, any environmental sensitive receivers and the locations of the monitoring stations (with co-ordinates of the monitoring locations).
- (iv) A brief summary of EM&A requirements including:
  - all monitoring parameters;
  - environmental quality performance limits (Action and Limit levels);
  - Event-Action Plans;
  - environmental mitigation measures, as recommended in the EIA report; and
  - environmental requirements in contract documents.
- (v) Implementation status:
  - advice on the implementation status of environmental protection and pollution control/mitigation measures as recommended in the EIA report.
- (vi) Monitoring results (in both hard and diskette copies) together with the following information:
  - monitoring methodology;
  - name of laboratory and types of equipment used and calibration details;
  - parameters monitored;
  - monitoring locations;
  - monitoring date, time, frequency, and duration;
  - weather conditions during the period;
  - any other factors which might affect the monitoring results; and
  - quality assurance (QA) / quality control (QC) results and detection limits.
- (vii) Report on non-compliance, complaints, notifications of summons and successful prosecutions:
  - record of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
  - record of all complaints received (written or verbal) for each media, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
  - record of all notification of summons and successful prosecutions for breaches of current environmental protection / pollution control legislations, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary;
  - review of the reasons for and the implications of non-compliance, complaints, summons and prosecutions including review of pollution sources and working procedures; and
  - description of the actions taken in the event of non-compliance and deficiency reporting and any follow-up procedures related to earlier noncompliance.
- (viii) Others:
  - an account of the future key issues as reviewed from the works programme and work method statements;
  - advice on the solid and liquid waste management status;
  - record of any project changes from the originally proposed as described in the EIA report (e.g. construction methods, mitigation proposals, design changes, etc.); and
  - comments (for examples, effectiveness and efficiency of the mitigation measures),

recommendations (for example, any improvement in the EM&A programme) and conclusions.

**Subsequent Monthly EM&A Report**

15.3.5 Subsequent monthly EM&A reports shall include the following:

- (i) Executive summary (1 - 2 pages):
  - breaches of Action and Limit levels;
  - complaints log;
  - notifications of any summons and successful prosecutions;
  - reporting changes; and
  - future key issues.
- (ii) Basic Project information:
  - project organisation including key personnel contact names and telephone numbers;
  - programme;
  - management structure;
  - the work undertaken during the month; and
  - any updates as needed to the scope of works and construction methodologies
- (iii) Environmental status:
  - advice on the status of statutory environmental compliance such as the status of compliance with the environmental ordinance and implementation status of mitigation measures;
  - works undertaken during the month with illustrations (such as location of works, daily excavation rate, etc.); and
  - drawing showing the project area, any environmental sensitive receivers and the locations of the monitoring stations.
- (iv) Implementation status:
  - advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in EIA report.
- (v) Monitoring results (in both hard and diskette copies) together with the following information:
  - monitoring methodology;
  - name of laboratory and types of equipment used and calibration details;
  - monitoring parameters;
  - monitoring locations;
  - monitoring date, time, frequency, and duration;
  - weather conditions during the period;
  - any other factors which might affect the monitoring results; and
  - quality assurance (QA) / quality control (QC) results and detection limits.
- (vi) Report on non-compliance, complaints, and notifications of summons and successful prosecutions:
  - record of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
  - record of all complaints received (written or verbal) for each media, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
  - record of all notification of summons and successful prosecutions for breaches of current environmental protection / pollution control legislations, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary;
  - review of the reasons for and the implications of non-compliance, complaints, summons and prosecutions including review of pollution sources and working procedures; and
  - description of the actions taken in the event of non-compliance and deficiency reporting and any follow-up procedures related to earlier noncompliance.
- (vii) Others:
  - an account of the future key issues as reviewed from the works programme and work method statements;
  - advice on the solid and liquid waste management status;

- record of any project changes from the originally proposed as described in the EIA Report (e.g. construction methods, mitigation proposals, design changes, etc.); and
  - comments (for examples, effectiveness and efficiency of the mitigation measures), recommendations (for example, any improvement in the EM&A programme) and conclusions.
- (viii) Appendix
- Action and Limit levels;
  - graphical plots of trends of monitored parameters at key stations over the past four reporting periods for representative monitoring stations annotated against the following:
    - major activities being carried out on site during the period;
    - weather conditions during the period; and
    - any other factors that might affect the monitoring results.
  - monitoring schedule for the present and next reporting period;
  - cumulative statistics on complaints, notifications of summons and successful prosecutions;
  - outstanding issues and deficiencies

#### **15.4 FINAL EM&A REVIEW REPORTS**

- 15.4.1 The construction phase final report shall be submitted within 1 month after completion of the Project. Meanwhile the operational phase final report shall be submitted within 1 month after the termination of post Project EM&A.
- 15.4.2 Prior to the proposed termination, it may be advisable to consult relevant local communities. The proposed termination should only be implemented after the proposal has been endorsed by the Supervisors and the Project Proponent.
- 15.4.3 The final EM&A report should contain at least the following information:
- (i) Executive summary (1 - 2 pages);
  - (ii) Drawings showing the Project area, any environmental sensitive receivers and locations of monitoring stations and commissioning test;
  - (iii) Basic project information including a synopsis of the project organisation, contacts of key management, and a synopsis of work undertaken during the course of the project or past twelve months;
  - (iv) A brief summary of EM&A requirements including:
    - environmental mitigation measure, as recommended in the EIA Report;
    - environmental impact hypotheses tested;
    - environmental quality performance limits (Action and Limit levels);
    - all monitoring parameters; and
    - Event and Action Plans.
  - (v) A summary of the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the EIA Report, and summarised in the updated implementation schedule;
  - (vi) Graphical plots and the statistical analysis of the trends of monitored parameters over the course of the project, including:
    - the major activities being carried out on site during the period;
    - weather conditions during the period;
    - any other factors which might affect the monitoring results.
  - (vii) A summary of non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
  - (viii) A brief review of the reasons for and the implications of non-compliance including review of pollution sources and working procedures;
  - (ix) A summary description of the actions taken in the event of non-compliance;
  - (x) A summary record of all complaints received (written or verbal) for each media, liaison and consultation undertaken, actions and follow-up procedures taken;
  - (xi) A review of the validity of the EIA Report recommendations;
  - (xii) Comments (for example, a review of the effectiveness and efficiency of the mitigation

- measures and of the performance of the environmental management system, that is, of the overall EM&A programme); and
- (xiii) Recommendations and conclusions (for example, a review of success of the overall EM&A programme to cost-effectively identify deterioration and to initiate prompt effective mitigatory action when necessary).

## **15.5 DATA KEEPING**

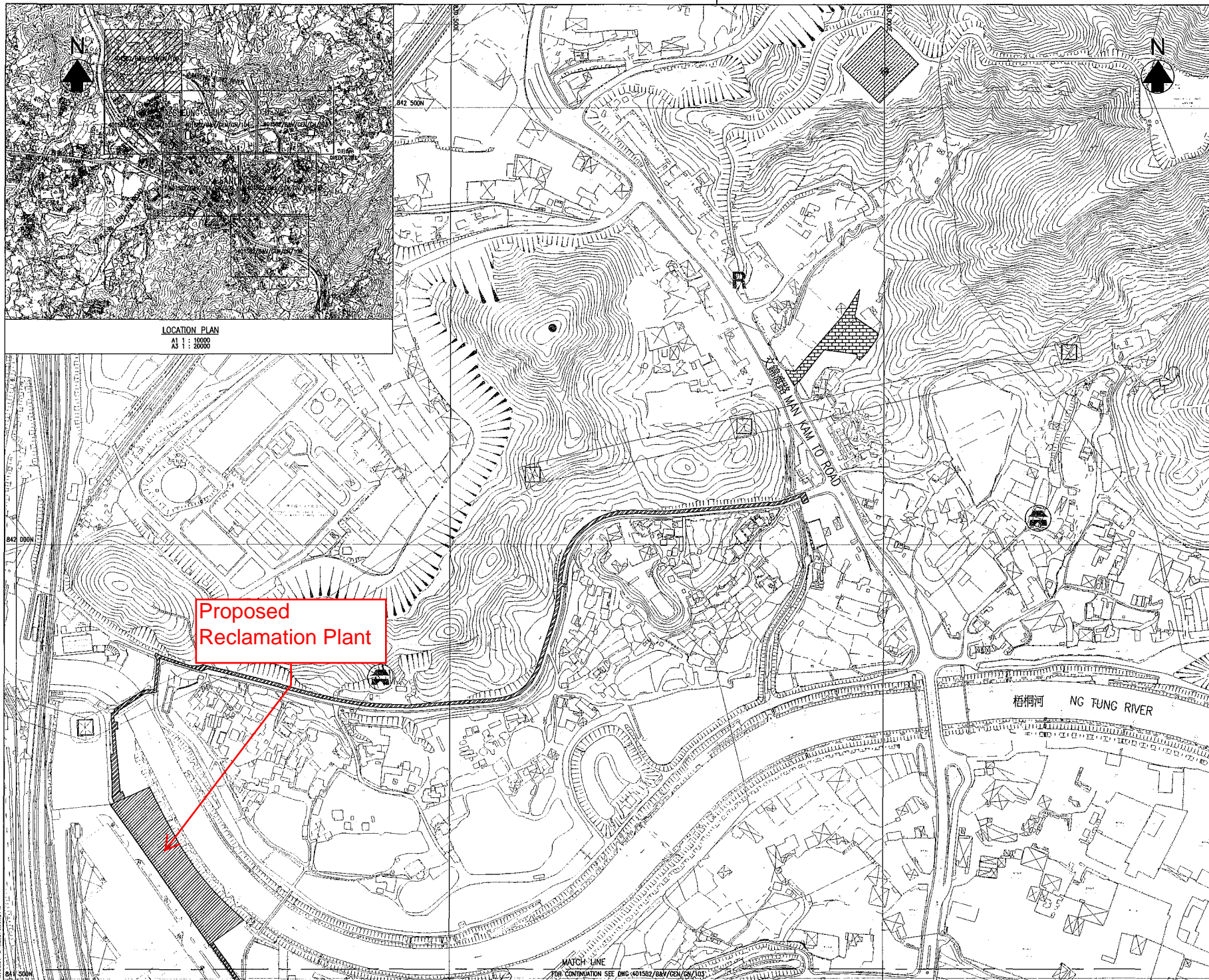
- 15.5.1 No site-based documents (such as monitoring field records, laboratory analysis records, site inspection forms, etc.) are required to be included in the monthly EM&A reports. However, any such document shall be well kept by the ET and be ready for inspection upon request. All relevant information shall be clearly and systematically recorded in the document. Monitoring data shall also be recorded on diskettes or other approved media, and the software copy must be available upon request. Data format shall be agreed with the Supervisor. All documents and data shall be kept for at least one year following completion of the construction phase monitoring for construction phase EM&A programme.

## **15.6 INTERIM NOTIFICATIONS OF ENVIRONMENTAL QUALITY LIMIT EXCEEDANCES**

- 15.6.1 With reference to the Event and Action Plan, when the environmental quality performance limits are exceeded, the ET Leader shall immediately notify the IEC and EPD, as appropriate. The notification shall be followed up with advice to the IEC and EPD on the results of the investigation, proposed actions and success of the actions taken, with any necessary follow-up proposals. A sample template for the interim notifications is presented in **Appendix F**.

## **APPENDIX A**

### **LAYOUT OF THE CONTRACT WORKS**



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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/B&V/GEN/GN/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-NL, 2-SL, 3-WW AND 3-SW.

**LEGEND:**

- PART 1 OF THE SITE
- PART 2 OF THE SITE
- PART 3 OF THE SITE
- PART 4 OF THE SITE
- PART 5 OF THE SITE
- PART 6 OF THE SITE
- PART 7 OF THE SITE
- PART W1 OF THE SITE

Revision	Date	Description	Drawn	Checked
W101	CWC	WH	SZ	GC
Date	02/21	02/21	02/21	02/21

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

Contract No. 3/WSD/20

Contract Title RECLAIMED WATER SUPPLY TO SHEUNG SHUI AND FANLING

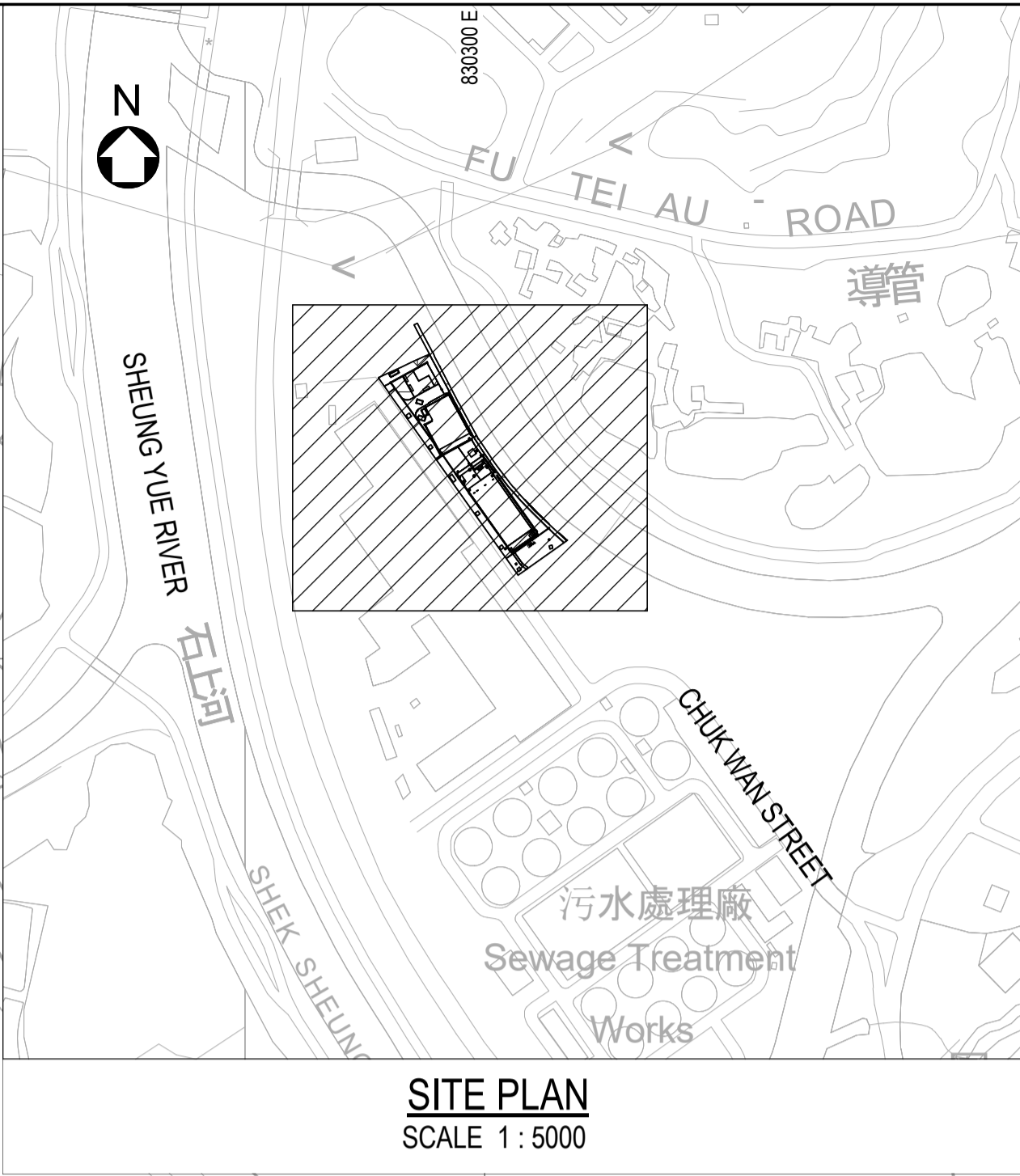
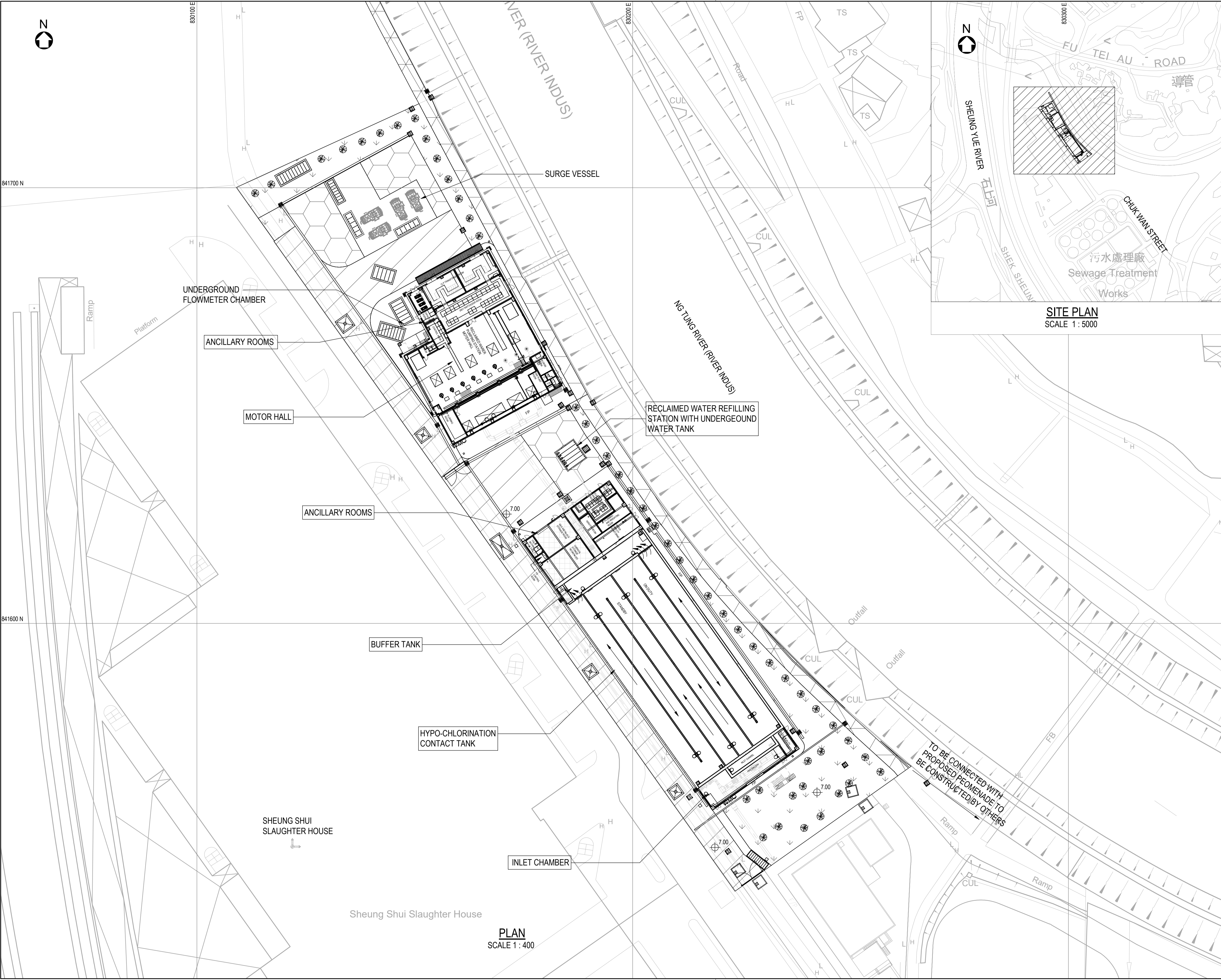
Drawing Title PART OF THE SITE (SHEET 1 OF 7)

Drawing No. 401582/B&V/GEN/GN/102

Scale A1 1:2000 A3 1:4000

**水務署**  
Water Supplies Department

**binnies**  
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寶尼新工程顧問有限公司



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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	Checked
Initial	CWC	GC	SZ	GC
Date	02/21	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.	Revision
401582/B&V/WRP/GA/101	-

Scale AS SHOWN

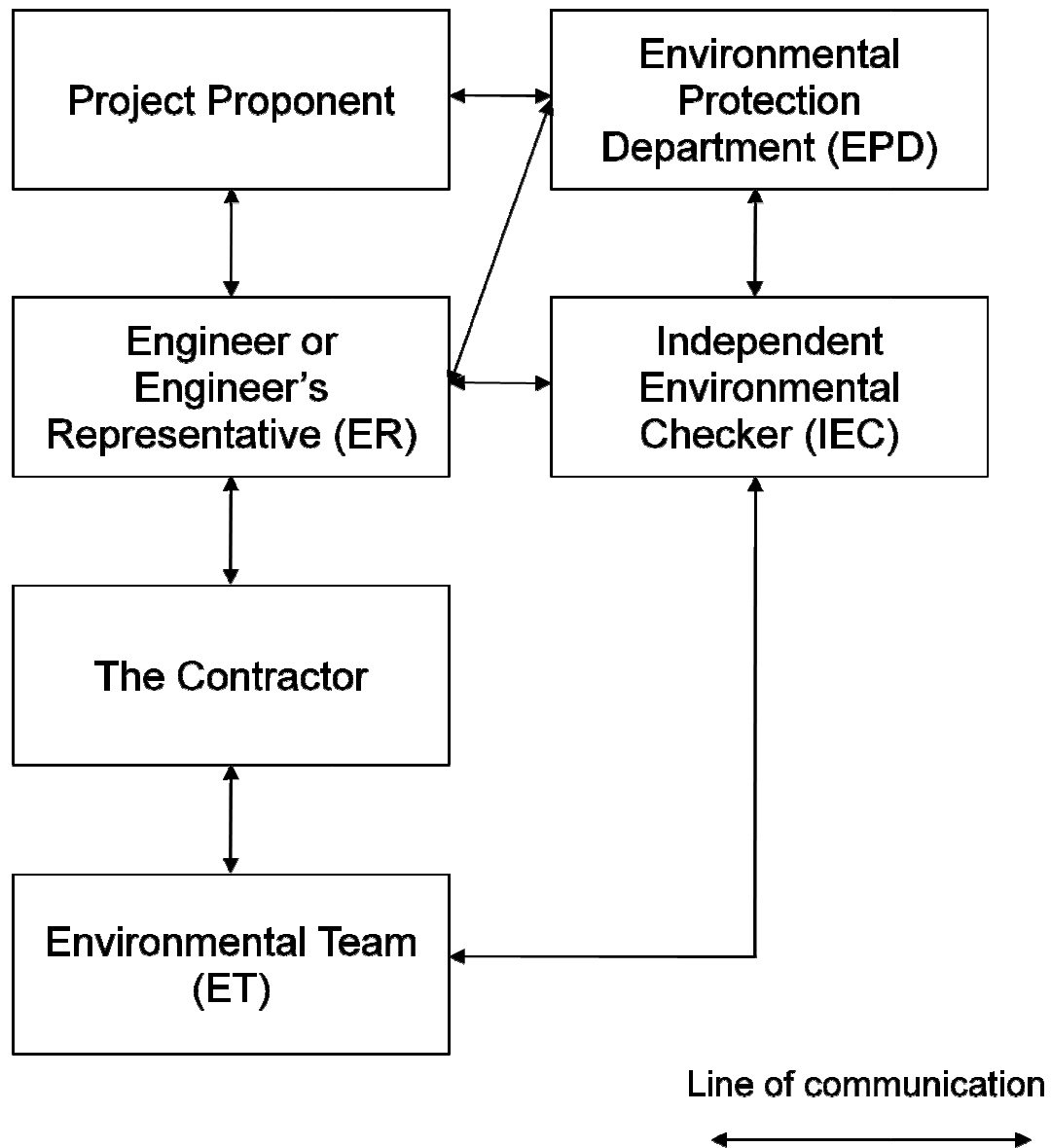
水務署  
Water Supplies  
Department

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賓尼斯工程顧問有限公司

## **APPENDIX B**

### **PROJECT ORGANIZATION AND LINES OF COMMUNICATION**

# Project Organization



## **APPENDIX C**

### **SAMPLE NOISE FIELD DATA SHEETS**

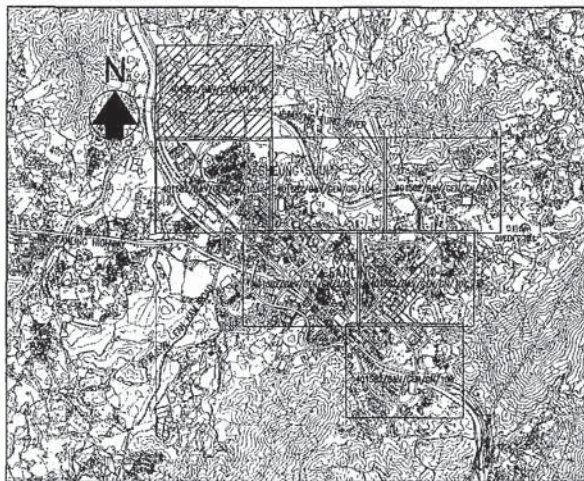
**Construction Noise Monitoring Field Record Sheet**

Monitoring Location		
Description of Location		
Date of Monitoring		
Measurement Start Time (hh:mm)		
Measurement Time Length (min.)		
Noise Meter Model/Identification		
Calibrator Model/Identification		
Measurement Results	L <sub>90</sub> (dB(A))	
	L <sub>10</sub> (dB(A))	
	L <sub>eq</sub> (dB(A))	
Major Construction Noise Source(s) During Monitoring		
Other Noise Source(s) During Monitoring		
Remarks		

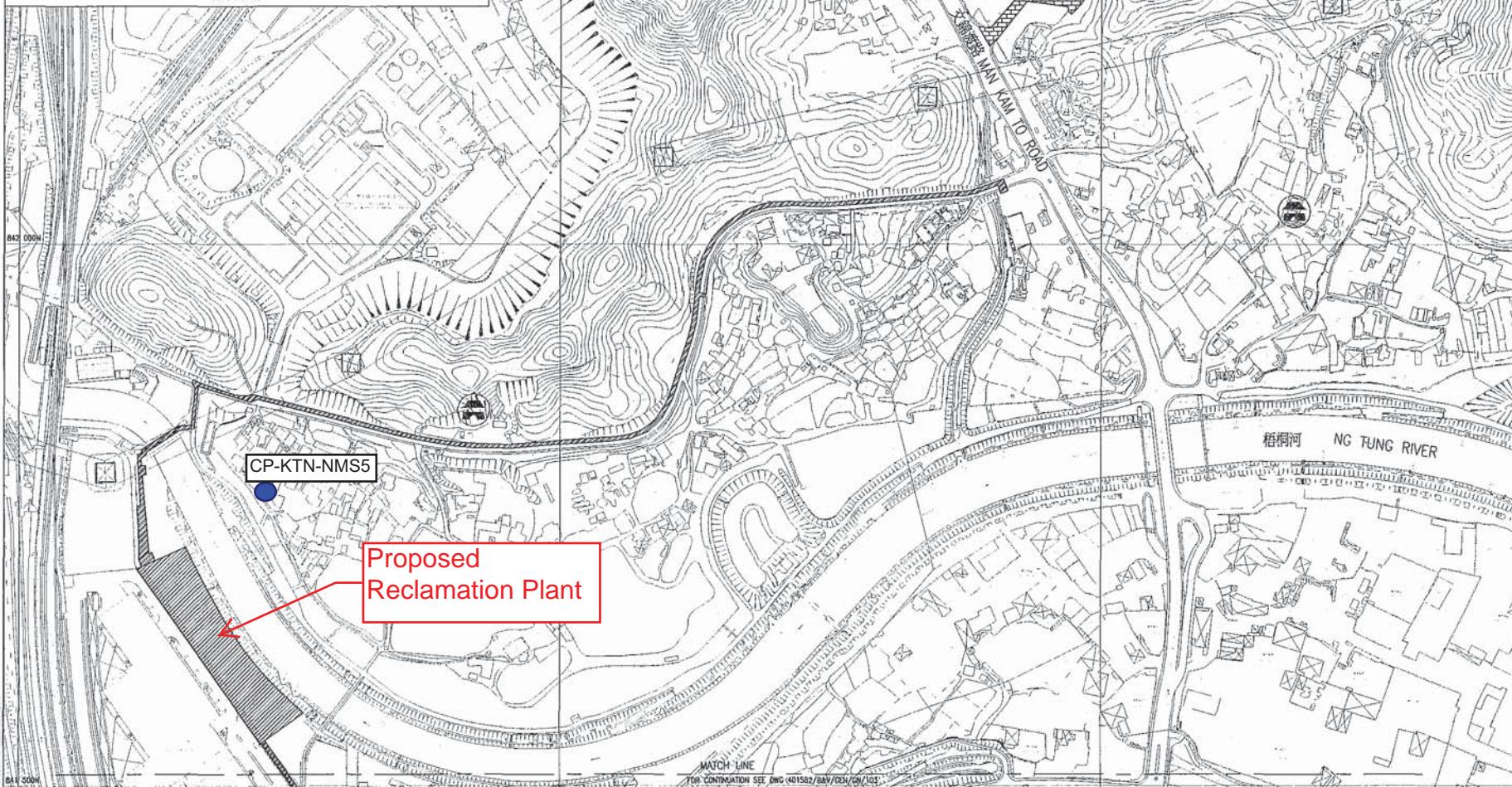
	<u>Name &amp; Designation</u>	<u>Signature</u>	<u>Date</u>
Recorded by:	_____	_____	_____
Checked by:	_____	_____	_____

## **APPENDIX D**

### **RECOMMENDED NOISE MONITORING LOCATIONS**



LOCATION PLAN  
A1 1:10000  
A3 1:20000



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**NOTES:**

1. ALL LEVELS ARE IN REFERENCE TO METRES ABOVE THE HONG KONG PRINCIPAL DATUM (HKPD) UNLESS OTHERWISE STATED.
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1. THE BASE PLAN IS EXTRACTED FROM SURVEY SHEET NOS. 2-NE, 2-SZ, 3AW AND 3-SM.

**LEGEND:**

- PART 1 OF THE SITE
- PART 2 OF THE SITE
- PART 3 OF THE SITE
- PART 4 OF THE SITE
- PART 5 OF THE SITE
- PART 6 OF THE SITE
- PART 7 OF THE SITE
- PART M1 OF THE SITE

Revised	Date	Description	Drawn	Checked
Initial	CWC	WH	SZ	GC
Date	02/21	02/21	02/21	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**

### **IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES**

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	<p>Following dust suppression measures should also be incorporated by the Contractor to control the dust nuisance throughout the construction phase:</p> <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>Good Site Practice</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>Storage of Waste</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

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		<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

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		<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	

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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 F**

### **SAMPLE TEMPLATE FOR THE INTERIM NOTIFICATION**

**Incident Report on Action Level or Limit Level Non-compliance**

<b>Project</b>	
<b>Date</b>	
<b>Time</b>	
<b>Monitoring Location</b>	
<b>Parameter</b>	
<b>Action &amp; Limit Levels</b>	
<b>Measured Level</b>	
<b>Possible reason for Action or Limit Level Non-compliance</b>	
<b>Actions taken / to be taken</b>	
<b>Remarks</b>	

Name & Designation

Signature

Date

Prepared by:

\_\_\_\_\_

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\_\_\_\_\_