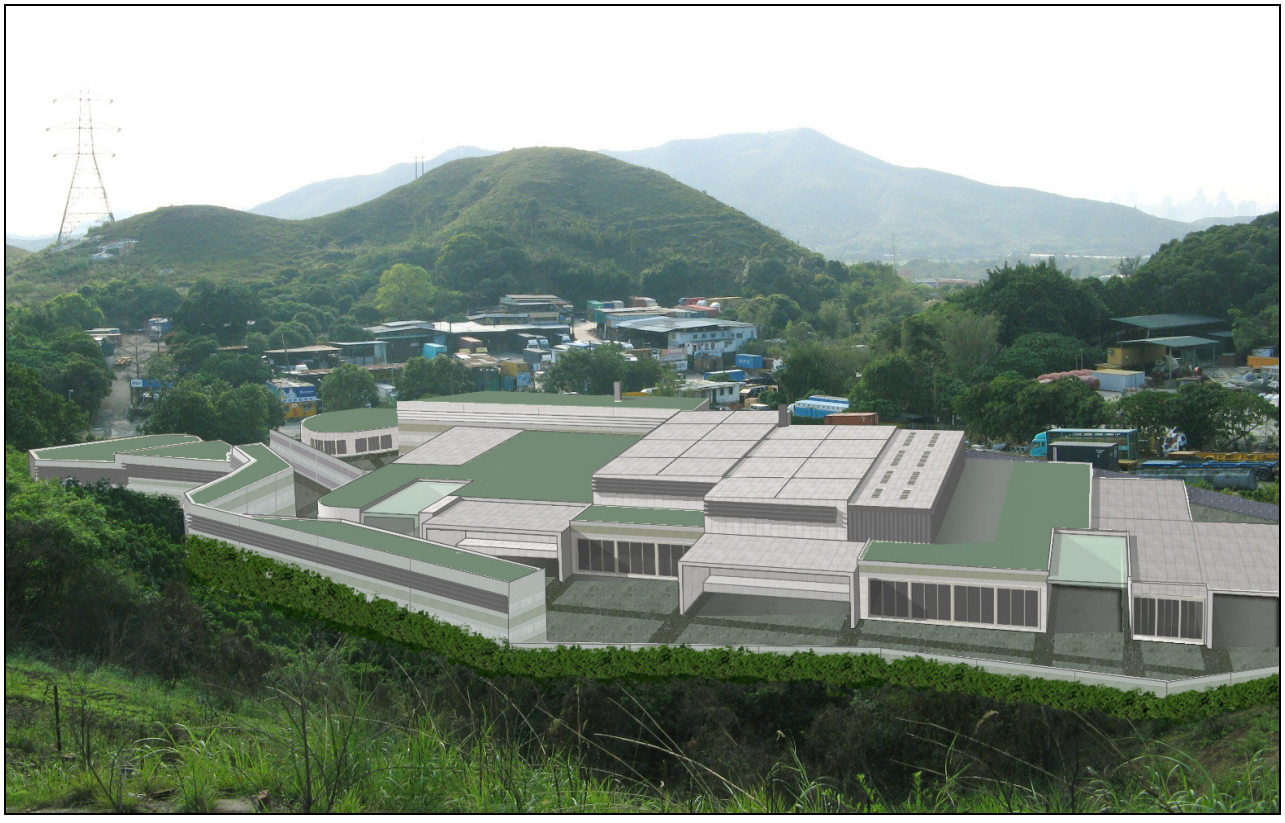
Architectural Services Department

Environmental Consultancy for

Provision of a Poultry Slaughtering Centre in Sheung Shui

Environmental Monitoring and Audit Manual

5 June 2009



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5 June 2009

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1 INTRODUCTION

1.1 Background

1.1.1 In order to pursue the goal of segregating live poultry and the population so as to minimise the risk of an outbreak of avian influenza, the Government of the HKSAR (the Government) has proposed to develop a Poultry Slaughtering Centre (PSC) for terrestrial poultry. A site in Sheung Shui has been identified for the development of the PSC, which will comprise two identical "stalls" that provide for reception of poultry, slaughter, packing and collection.

1.1.2 The PSC is expected to provide freshly slaughtered chickens and a smaller number of freshly slaughtered "minor" poultry, such as pigeons, chukar, guinea fowl, pheasant, etc. The PSC products will cater for market demand for slaughtered poultry, such as from the restaurant trade, fresh provisions shops, wet markets and supermarkets.

1.1.3 The Food and Environmental Hygiene Department (FEHD) in consultation with the Food and Health Bureau (FHB) will oversee the development of the project, whilst Architectural Services Department (ArchSD) is the works department. Hyder Consulting Limited has been engaged by ArchSD to undertake the Environmental Impact Assessment (EIA) in accordance with EIA Study Brief (ESB) No. ESB-163/2007, which was issued by the Environmental Protection Department (EPD) on 15 February 2007 under Section 5(1)(a) of the Environmental Impact Assessment Ordinance (EIAO).

1.1.4 The Government intends to provide the infrastructure and buildings comprising the PSC and will tender out each stall to a private Operator who will be responsible for fitting out the buildings and operating their stall. Under this arrangement, an Environmental Permit (EP) will be applied for, prior to commencement of site formation and construction, and may reference this EIA Report. The two Operators will each be required to meet the operational requirements of the EP.

1.2 Project Description

1.2.1 The location of this site is shown in ***Figure 1-1***. The site is bounded by Man Kam To Road to the southwest, Hung Kiu San Tsuen to the south and vegetated area to the east and north. The total area is about 13,700m^2.

1.2.2 The PSC will be a single-storey building with part of the supporting mechanical plant on the rooftop. Two "stalls" (the main building) will each comprise loading/unloading areas; crate cleaning and storage areas holding, killing, scalding, evisceration, packing and storage areas; isolation and inspection areas; changing rooms; and offices. At one end of the building will be a shared truck disinfection passageway. In addition to the main building, separate ancillary buildings will also be constructed, including an office, wastewater treatment facilities (WTFs), E&M plant rooms; fuel storage tanks and generators.

1.2.3 The related supporting mechanical plant, such as boiler rooms, odour removal systems and air handling units for each stall will be placed on the centre area of the rooftop.

1.2.4 The PSC site will be formed into a series of flat platforms, rising from 13.7mPD at the boundary with Man Kam To Road to a maximum elevation of 22.1mPD. The maximum external elevation of the main building will be 10m and the maximum external elevation of the WTF building will be 6m. The main building will cover an area of approximately 5,545m^2 and together with the ancillary buildings, the total site coverage will be some 7,095m^2.

1.2.5 Under normal circumstances, the estimated daily throughput of the PSC will be about 20,000 chickens, however, to respond to market demands during festive periods (which occur only a few times annually, each lasting for not more than seven days), the daily maximum slaughtering capacity of the PSC will be increased to 30,000 chickens – this is considered to be the "worst case" scenario and was used as the basis for assessment in the EIA Report. Manual slaughtering of minor poultry will also take place, with a maximum slaughtering capacity of 3,000 minor poultry per day, in addition to the chickens. The PSC is anticipated to operate 365 days per year.

1.3 Implementation and Programme

1.3.1 The Government intends to provide the infrastructure and buildings comprising the PSC and will tender out each stall to a private Operator who will be responsible for fitting out the buildings and operating their stall. Under this arrangement, an EP will be applied for, prior to commencement of site formation and construction, and may reference this EIA Report. The two Operators will each be required to meet the operational requirements of the EP.

1.3.2 Key programme dates for the Project are:

- 2009 Appointment of the Consultant for the Design
- 2010 Site Available
- 2010 Invite Open Tender for Construction
- 2010 Commence Construction
- 2011 Invite Open Tenders for Operation of the Stalls
- 2012 Completion of Construction

1.4 Purpose of the EM&A Manual

1.4.1 The purpose of this Environmental Monitoring and Audit (EM&A) Manual (hereafter refer to as the "Manual") is to guide the set up of an EM&A programme to ensure compliance with the Environmental Impact Assessment (EIA) study recommendations, to assess the effectiveness of the recommended mitigation measures and to identify any further need for additional mitigation measures or remedial action. This Manual outlines the monitoring and audit programme for the construction phase of the Project. It aims to provide systematic procedures for monitoring, auditing and minimising environmental impacts associated with construction works and operational activities.

1.4.2 Hong Kong environmental regulations, the *Hong Kong Planning Standards and Guidelines* (HKPSG) and recommendations in the EIA Report for the Project have served as environmental standards and guidelines in the preparation of this Manual. In addition, the EM&A Manual has been prepared in accordance with the requirements stipulated in Appendix 21 of the *Technical Memorandum on the EIA Process* (EIAO-TM).

1.4.3 This Manual contains the following information:

- Responsibilities of the Government Agent / Term Contractor, the Architect's Representative (AR), the Environmental Team (ET) and the Independent Environmental Checker (IEC) with respect to the environmental monitoring and audit requirements during the course of the Project;
- EM&A organisation for the Project;
- The basis for, and description of the broad approach underlying the EM&A programme;
- Requirements with respect to the construction schedule and the necessary environmental monitoring and audit programme to track the varying environmental impact;
- Details of the methodologies to be adopted, including all field 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;
- Requirements for presentation of environmental monitoring and audit data and appropriate reporting procedures;
- Requirements for review of EIA predictions and the effectiveness of the mitigation measures / environmental management systems and the EM&A programme.

1.4.4 For the purpose of this manual, the ET Leader, who shall be responsible for and in charge of the ET, shall refer to the person delegated the role of executing the EM&A requirements.

1.5 Environmental Monitoring and Audit Requirements

1.5.1 Potential impacts from the construction and operation phases have been assessed and presented in the EIA Report. The EIA Report has specified the recommended environmental mitigation measures to minimise any potential adverse environmental impacts identified. An implementation schedule of the recommended environmental mitigation measures is prepared as part of the EIA study and is summarised in ***Appendix 1*** of this Manual.

1.5.2 To ensure that the mitigation measures recommended in the EIA study are implemented fully and resulted in the expected effectiveness, this Manual defines the scope of EM&A requirements for the construction and operation of the Project to achieve satisfactory environmental performance.

1.5.3 The EM&A requirements for the Project shall be as follows:

- Construction Phase – conduct baseline monitoring prior to any Project activity occurring on site, and then conduct impact monitoring and environmental audit during all construction activities; and
- Operation Phase – conduct odour monitoring during the operation of the PSC and landscape monitoring during the first year of operation (the establishment period).

1.5.4 The environmental monitoring programme shall also be assessed by regular environmental audit. This aims to determine whether satisfactory compliance with the legislative requirements has been met, and to ensure that no impact is being caused to sensitive receivers. If impact is being caused, the remedial action plan will be initiated, if required. This shall require information on the standards for parameters of concern and monitoring data.

1.5.5 The environmental audit shall review the monitoring data and compare the audit conditions with the relevant legislative requirements and environmental performance standards specified in the Contract Document.

1.6 EM&A Organisation – Construction Phase

1.6.1 The proposed EM&A organisation and lines of communication with respect to environmental protection works during the construction phase are shown in ***Figure 1-2a***. The Works Contractor shall engage an ET for the Construction Phase and the AR shall engage the IEC. The ET shall be an independent party from the Works Contractor and from the IEC.

1.6.2 The ET shall be led and managed by an ET Leader who have at least 7 years experience in EM&A or environmental management. The IEC shall have the same experience and professional qualifications as the ET Leader.

1.6.3 Sufficient and suitably qualified professional and technical staff should be employed by the respective parties to ensure full compliance with their duties and responsibilities, as required under the EM&A programme.

1.6.4 The responsibility of respective parties are outlined below.

The Works Contractor

- Employ an ET to undertake monitoring, audit, laboratory analysis and reporting as per the EM&A programme, including baseline monitoring prior to the commencement of works;
- Provide information / advice to the ET regarding works activities which may contribute, or be continuing to the generation of adverse environmental conditions;
- 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 whenever Action and Limit levels are exceeded;
- Implement the corrective actions instructed by the AR;
- Accompany joint site inspection undertaken by the ET; and
- Adhere to the procedures for carrying out complaint investigation in accordance with ***Section 6.3***.

Environmental Team

- Monitor various environmental parameters as required in the EM&A Manual;
- Analyse the environmental monitoring and audit data and review the success of EM&A programme to 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 Works Contractor's site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and effect proactive action to pre-empt problems;
- Audit and prepare audit reports on the environmental monitoring data and site environmental conditions;
- Report on the environmental monitoring and audit results to the IEC, the Works Contractor, the AR and EPD or its delegated representative;
- Recommend suitable mitigation measures to the Works Contractor in the case of exceedance of Action and Limit levels in accordance with the Event and Action Plans; and
- Adhere to the procedures for carrying out complaint investigation in accordance with ***Section 6.3***.

Architect's Representative

- Supervise the Works Contractor's activities and ensure that the requirements in the EM&A Manual are fully complied with;
- Inform the Works Contractor when action is required to reduce impacts in accordance with the Event and Action Plans;
- Participate in joint site inspection undertaken by the Work Contractor's ET;
- Employ an IEC to audit the results of the EM&A works carried out by the Work Contractor's ET; and
- Adhere to the procedures for carrying out complaint investigation in accordance with ***Section 6.3***.

Independent Environmental Checker

- Review the EM&A works performed by the Work Contractor's 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 AR and EPD in parallel;
- Review the EM&A reports (monthly and quarterly summary reports) submitted by the Work Contractor's ET;
- Review the proposal on mitigation measures submitted by the Works Contractor in accordance with the Event and Action Plans; and
- Adhere to the procedures for carrying out complaint investigation in accordance with ***Section 6.3***.

1.7 EM&A Organisation – Operation Phase

1.7.1 The proposed EM&A organisation and lines of communication with respect to environmental protection works during the operation phase are shown in ***Figure 1-2b***. The Government Agent / Term Contractor / Operator shall engage an ET for the Operation Phase. No IEC is needed.

1.7.2 The ET shall be led and managed by an ET Leader who have at least 7 years experience in EM&A or environmental management.

1.7.3 Sufficient and suitably qualified professional and technical staff should be employed by the respective parties to ensure full compliance with their duties and responsibilities, as required under the EM&A programme.

1.7.4 The proposed responsibilities of respective parties are outlined below.

Government Agent / Term Contractor / Operator

- Employ an ET to undertake monitoring, audit and reporting for odour and landscape and visual as per the EM&A programme during the Operation Phase;
- Provide information / advice to the ET regarding operational activities which may contribute, or be continuing to the generation of adverse environmental conditions (after consultation with the Operators);
- In conjunction with the Operators, agree to proposals submitted by the ET on mitigation measures in case of exceedances of Action and Limit levels in accordance with the Event and Action Plans;
- For odour-related issues, agree with the Operator to implement measures to reduce odour whenever Action and Limit levels are exceeded, and implement the corrective actions as recommended by the ET;
- For landscape and visual-related issues, implement measures whenever Action and Limit levels are exceeded, and implement the corrective actions recommended by the ET; and
- Adhere to the procedures for carrying out complaint investigation in accordance with ***Section 6.3***.

Operators

- Provide information / advice to the ET and Government Agent / Term Contractor regarding operational activities which may contribute, or be continuing to the generation of adverse environmental conditions;
- In conjunction with the Government Agent / Term Contractor, agree to proposals submitted by the ET on mitigation measures in case of exceedances of Action and Limit levels in accordance with the Event and Action Plans;
- Agree with the Government Agent / Term Contractor to implement measures to reduce odour whenever Action and Limit levels are exceeded; and
- Implement the corrective actions as recommended by the ET
- Adhere to the procedures for carrying out complaint investigation in accordance with ***Section 6.3***.

Environmental Team

- Monitor various environmental parameters as required in the EM&A Manual;
- Analyse the environmental monitoring and audit data and review the success of EM&A programme to confirm the adequacy of mitigation measures implemented and the validity of the EIA predictions and to identify any adverse environmental impacts arising;

- Audit and prepare audit reports on the environmental monitoring data and site environmental conditions;
- Report on the environmental monitoring and audit results to the Government Agent / Term Contractor and EPD or its delegated representative;
- Recommend suitable mitigation measures to the Government Agent / Term Contractor and Operator in the case of exceedance of Action and Limit levels in accordance with the Event and Action Plans; and
- Adhere to the procedures for carrying out complaint investigation in accordance with ***Section 6.3***.

1.8 Structure of the Manual

1.8.1 Following this introductory section, this Manual is set out as follows:

- **Section 2.** Describes details of site audit requirements for mitigation measures on dust during the construction phase and odour monitoring during operation phase; Action and Limit Levels; and contingency procedures.
- **Section 3.** Describes details of requirements for baseline and impact air quality and construction noise monitoring; Action and Limit Levels; and contingency procedures.
- **Section 4.** Describes details of requirements for baseline, construction and operation landscape and visual EM&A; Action and Limit Levels; and contingency procedures.
- **Section 5.** Describes details of requirements of site audit for implementation of mitigation measures during construction phase for water quality.
- **Section 6.** Describes the scope, approach and frequency of site audit, and complaint handling procedure.
- **Section 7.** Describes the reporting requirements, data keeping requirements, electronic reporting of EM&A information as well as the procedures of the issue of Notification of Exceedances to relevant parties in case exceedance in the measurement result is recorded.
- **Appendix 1.** Provides a Project Implementation Schedule (this schedule is identical to that provided in ***Appendix 5 of the EIA Report***) that identifies which parties are responsible for which environmental mitigation measures. Please note that not all mitigation measures listed in the Project Implementation Schedule are included in the EM&A programme specified in this EM&A Manual.
- **Appendices 2 to 4.** Provide sample templates for environmental monitoring.

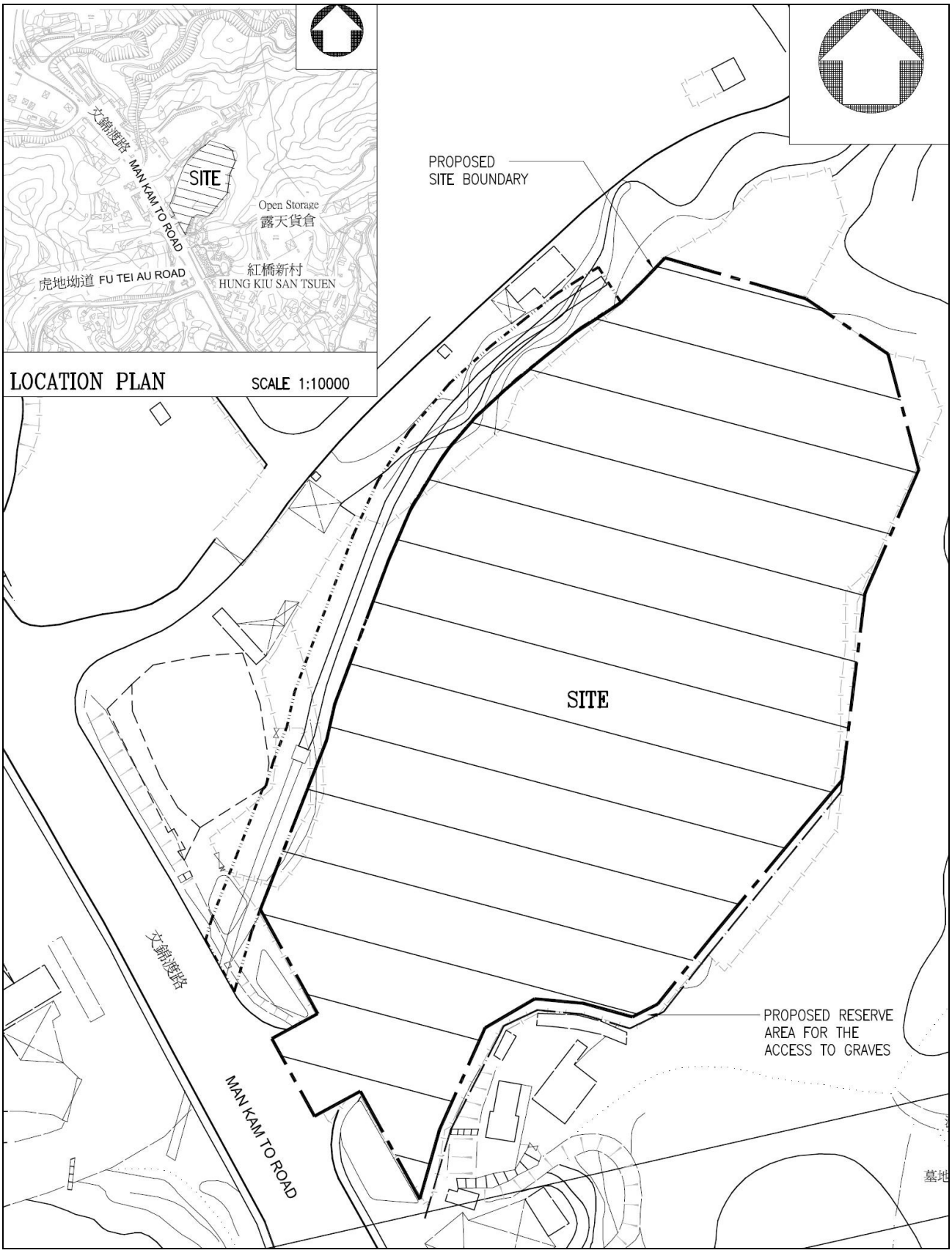


Figure 1-1 Location of the Proposed Site

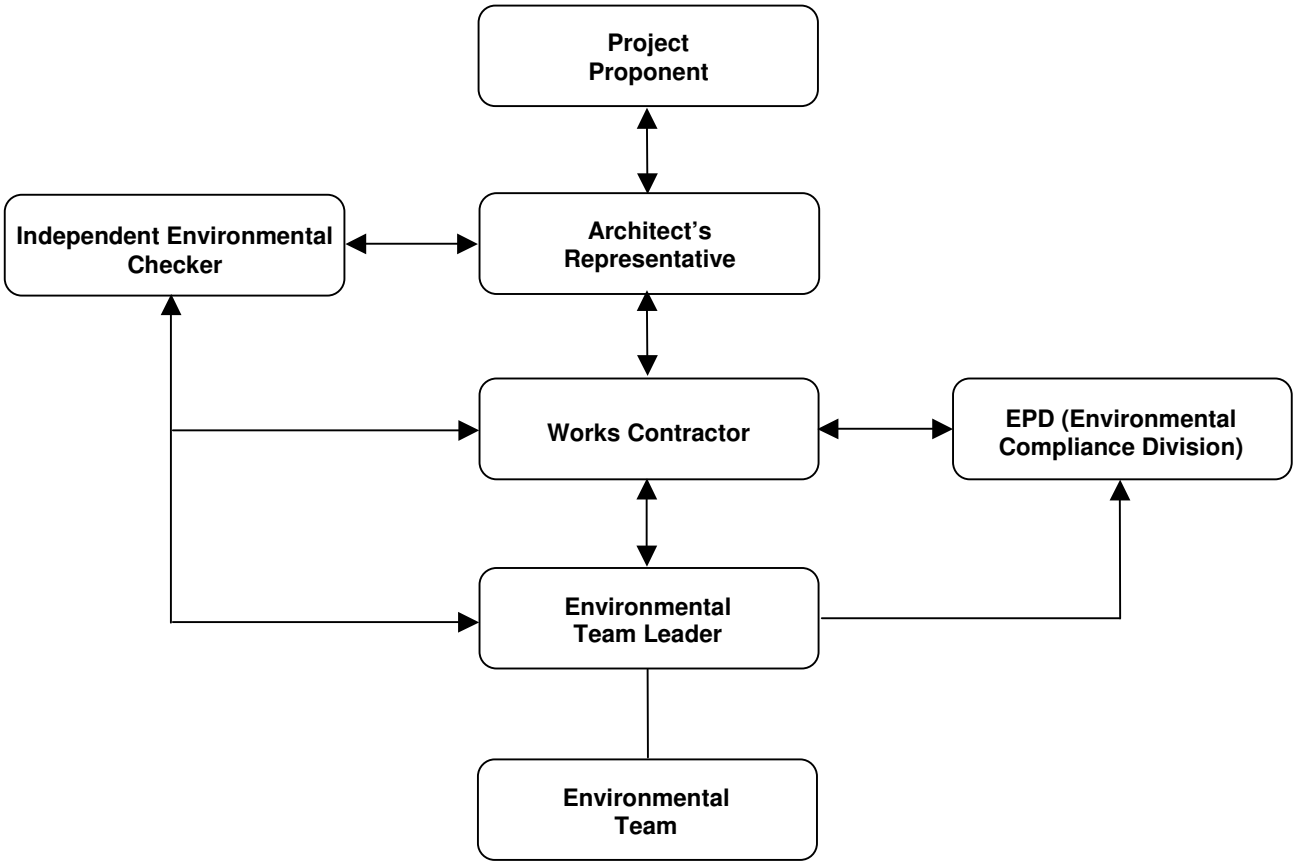


Figure 1-2a EM&A Organisation – Construction Phase

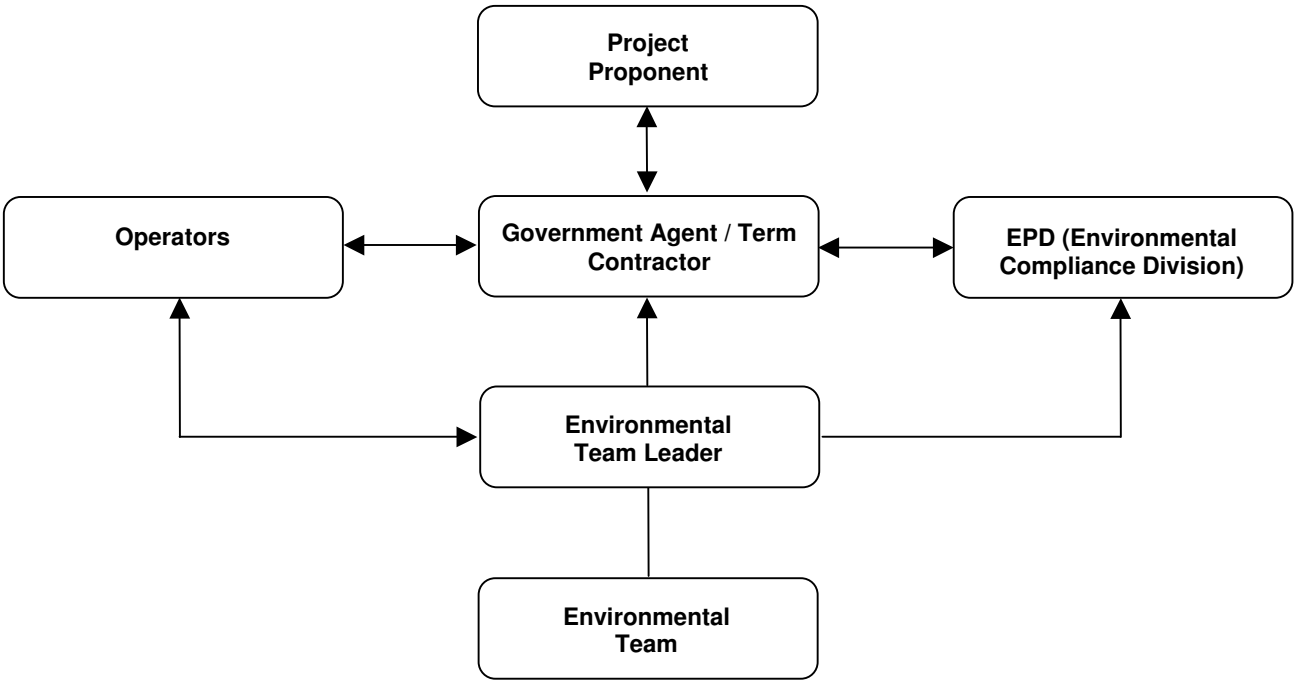


Figure 1-2b EM&A Organisation – Operation Phase

2 AIR QUALITY

2.1 Introduction

2.1.1 The air quality assessment in the EIA report concluded that dust emissions from the construction phase will be reduced to the minimum achievable level by implementation of the mitigation measures and good site practice recommended in the EIA Report and in ***Section 2.4*** of this Manual.

2.1.2 However, given the close proximity of the nearest ASR (the adjacent Hung Kiu San Tsuen) quantitative monitoring of dust (i.e. 1-hour and 24-hour TSP) shall be carried out during the construction phase.

2.1.3 To prevent uncontrolled air emissions, all activities relating to slaughtering of poultry will be carried out within the PSC in a negative pressure environment, achieved through the use of appropriate air handling plant. To further reduce any potential impact on air quality, the ventilation exhaust location shall be located at a point furthest from the ASRs in Hung Kiu San Tsuen.

2.1.4 The air quality assessment result has demonstrated that with recommended mitigation (air scrubbers) there will be no odour impacts at any ASRs, even under worst-case conditions. Nevertheless, regular odour monitoring by means of odour patrols is recommended during the first year of operation to monitor the effectiveness of the mitigation measures as recommended the EIA and ensure that nearby sensitive receivers will not be subject to unforeseen odour nuisance.

2.2 Construction Phase Dust Monitoring

2.2.1 Monitoring of the Total Suspended Particulates (TSP) levels shall be carried out by the ET during the construction phase in order to ensure that any deteriorating air quality can be readily detected and timely action taken to rectify the situation.

2.2.2 TSP levels in 1-hour and 24-hour shall be measured to indicate the impacts of construction dust on air quality. TSP levels shall be measured by following the standard high volume sampling (HVS) method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50)*, *Appendix B*. Upon approval of the AR and the IEC, 1-hour TSP levels can be measured by direct reading methods which are capable of producing comparable results as that by the high volume sampling method, to indicate short event impacts.

2.2.3 All relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the stat and stop of the sampler, identification and weight of the filter paper, and other special phenomena and work progress of the concerned site etc. shall be recorded down in details. A sample field log sheet is shown in ***Appendix 2***.

Monitoring Equipment

2.2.4 High Volume Sampler (HVS) in compliance with the following specifications shall be used for carrying out the 1-hour and 24-hour TSP monitoring:

- 0.6-1.7 m^3/min (20-60 SCFM) adjustable flow range;
- Equipped with a timing / control device with ± 5 minutes accuracy for 24 hours operation;
- Installed with elapsed-time meter with ± 2 minutes accuracy for 24 hours operation;
- Capable of providing a minimum exposed area of 406 cm^2 (63 in^2);
- Flow control accuracy: ± 2.5% deviation over 24-hour sampling period;
- Equipped with a shelter to protect the filter and sampler;
- Incorporated with an electronic mass flow rate controller or other equivalent devices;
- Equipped with a flow recorder for continuous monitoring;
- Provided with a peaked roof inlet;
- Incorporated with a manometer;
- Able to hold and seal the filter paper to the sampler housing at horizontal position;
- Easy to change the filter; and
- Capable of operating continuously for 24-hour period.

2.2.5 The ET Leader shall be responsible for provision of the monitoring equipment and associated power supply. The ET Leader shall ensure that sufficient numbers of HVSs with an appropriate calibration kit are available for carrying out the regular impact monitoring and *ad hoc* monitoring. The HVSs shall be equipped with an electronic mass flow controller and be calibrated against a traceable standard at regular intervals. All the equipment, calibration kit, filter papers, etc. shall be clearly labelled. The ET Leader shall also liaise with the concerned parties for gaining access to the monitoring stations for the installation of the monitoring equipment and carrying out the monitoring.

2.2.6 The flow rate of each HVS with mass flow controller shall be calibrated using an orifice calibrator. Initial calibration of dust monitoring equipment shall be conducted upon installation and prior to commissioning. One point flow rate calibration shall be carried out every two months. Five-point calibration shall be carried out every six months.

2.2.7 The transfer standard shall be traceable to the internationally recognized primary standard and be calibrated annually. The calibration data shall be properly documented for future reference by concerned parties, such as the IEC. All the data shall be converted into standard temperature and pressure conditions.

2.2.8 If the ET Leader proposes to use a direct reading dust meter to measure 1-hour TSP levels, he shall submit sufficient information to the IEC to prove that the instrument is capable of achieving a comparable result as that of HVS. The instrument shall also be calibrated regularly, and the 1-hour TSP sampling shall be determined periodically by HVS to check the validity and accuracy of the results measured by direct reading method.

2.2.9 Wind data monitoring equipment shall also be provided and set up at conspicuous locations for logging wind speed and wind direction near to the dust monitoring locations. The equipment

installation location shall be proposed by the ET Leader and agreed with the AR in consultation with the IEC. For installation and operation of wind data monitoring equipment, the following points shall be observed:

- The wind sensors shall be installed on masts at an elevated level 10m above ground so that they are clear of obstructions of turbulence caused by the buildings;
- The wind data shall be captured by a data logger and to be downloaded for processing at least once a month;
- The wind data monitoring equipment shall be re-calibrated at least once every six months; and
- Wind direction shall be divided into 16 sectors of 22.5 degrees each.

2.2.10 In exceptional situations, the ET Leader may propose alternative methods to obtain representative wind data from the IEC and the AR, and agreement from the IEC.

Laboratory Measurement / Analysis

2.2.11 A clean laboratory with constant temperature and humidity control, and equipped with necessary measuring and conditioning instruments to handle the dust samples collected, shall be made available for sample analysis, and equipment calibration and maintenance. The laboratory is preferably Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited.

2.2.12 If a site laboratory is set up or a non-HOKLAS accredited laboratory is hired for carrying out the laboratory analysis, the laboratory equipment and measurement procedures shall meet with the satisfaction of the AR in consultation with the IEC. The ET Leader shall provide the AR with one copy of the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B* for his reference.

2.2.13 Filter paper of size 8”×10” shall be labelled before sampling. It shall be a clean filter paper with no pin holes, and shall be conditioned in a humidity controlled chamber for over 24-hour and be pre-weighed before use for the sampling.

2.2.14 After sampling, the filter paper loaded with dust shall be kept in a clean and tightly sealed plastic bag. The filter paper is then returned to the laboratory for reconditioning in the humidity controlled chamber followed by accurate weighing by an electronic balance with a readout down to 0.1 mg. The balance shall be regularly calibrated against a traceable standard.

2.2.15 All the collected samples shall be kept in a good condition for 6 months before disposal.

Monitoring Location

2.2.16 One designated monitoring station, namely A1a, is selected for 1-hour and 24-hour TSP monitoring. ***Table 2-1*** describes the air quality monitoring location, which is also depicted in ***Figure 2-1***.

Air Monitoring Location ID	Location
A1a	Hung Kiu San Tsuen

Table 2-1 Construction Phase Air Quality Monitoring Location

2.2.17 The status and locations of dust sensitive receivers may change after issuing this Manual. If such cases exist, the ET Leader shall propose updated monitoring locations and seek approval from the AR and the IEC and agreement from EPD on the proposal.

2.2.18 When alternative monitoring locations are proposed, the following criteria for the proposed locations, as far as practicable, shall be followed:

- To be located at the site boundary or such locations close to the major dust emission source;
- To be located close to the sensitive receivers; and
- Take into account the prevailing meteorological conditions.

2.2.19 The ET Leader shall agree with the AR on the position of the HVS for installation of the monitoring equipment. When positioning the HVS, the following points shall be noted:

- A horizontal platform shall be provided with appropriate support to secure the samplers against gusty wind;
- The distance between the sampler and an obstacle, such as buildings, shall be at least twice the height that the obstacle protrudes above the sampler;
- A minimum of 2m of separation from walls, parapets and other structures is required for rooftop samples;
- A minimum of 2m separation from any supporting structure, measured horizontally is required;
- No furnaces or incineration flues are nearby;
- Airflow around the sampler is unrestricted;
- The sampler is more than 20m from any drip line;
- Any wire fence and gate, to protect the sampler, shall not cause any obstruction during monitoring;
- Permission must be obtained to set up the samplers and to obtain access to the monitoring stations; and
- A secured supply of electricity is needed to operate the samplers.

Baseline Monitoring

2.2.20 Baseline monitoring shall be carried out at all the designated monitoring location for at least 14 consecutive days prior to the commencement of the major construction works to obtain daily 24-hour TSP samples. 1-hour TSP sampling shall also be done at least three times per day while highest dust impact is expected. Before commencing the baseline monitoring, the ET Leader shall submit the baseline monitoring programme to the AR and the IEC for approval.

2.2.21 During the baseline monitoring, there shall not be any construction or dust generation activities from the Project in the vicinity of the monitoring stations.

2.2.22 In case the baseline monitoring cannot be carried out at the designated monitoring locations during the baseline monitoring period, the ET Leader shall propose alternative monitoring locations that can effectively represent the baseline conditions at the impact monitoring

locations. The alternative baseline monitoring locations shall be approved by the AR and agreed with the IEC.

2.2.23 In exceptional cases, when insufficient baseline monitoring data or questionable results are obtained, the ET Leader shall liaise with the IEC and EPD to agree on an appropriate set of data to be used as a baseline reference and submit to AR and IEC for approval.

2.2.24 Ambient conditions may vary seasonally and shall be reviewed at six monthly intervals. If the ET Leader considers that the ambient conditions have been changed and baseline levels need to be updated by means of a repeat of the baseline monitoring. The monitoring shall be conducted at times when the Contractor's activities are not generating dust, at least in the proximity of the monitoring stations. Should changes in ambient conditions be determined, the baseline levels and, in turn, the air quality criteria, shall be revised. The revised baseline levels and air quality criteria shall be agreed with the IEC and EPD.

Impact Monitoring

2.2.25 The ET Leader shall carry out impact monitoring during the course of the construction phase of the Project. Regular impact monitoring consists of three sets of 1-hour TSP and one set of 24-hour TSP sampling once every six days during the time when the highest dust impact occurs. The specific time to start and stop the 24-hr TSP monitoring shall be clearly defined for each location and shall be strictly followed. A sample raw data sheet is shown in ***Appendix 2***.

2.2.26 In case of non-compliance with the air quality criteria, more frequent monitoring shall be conducted within 24 hours after the result is obtained. This additional monitoring shall be continued until the excessive dust emission or the deterioration in air quality caused by the Project is rectified.

Event and Action Plan for Air Quality

2.2.27 The baseline monitoring results form the basis for determining the air quality criteria for the impact monitoring. The ET Leader shall compare the impact monitoring results with air quality criteria set up for 1-hour TSP and 24-hour TSP. ***Table 2-2***, below, shows the Action and Limit levels to be used. Should non-compliance of the air quality criteria occur, actions in accordance with the Event and Action Plan in ***Table 2-3*** shall be carried out.

Parameters	Action Level	Limit Level
24-hour TSP Level in µg/m³	For baseline level ≤ 200 µg/m³, Action level = (average of baseline level *1.3 + Limit level)/2 For baseline level > 200 µg/m³, Action level = Limit level	260
1-hour TSP Level in µg/m³	For baseline level ≤ 384 µg/m³, Action level = (average of baseline level * 1.3 + Limit level)/2 For baseline level > 384 µg/m³, Action level = Limit level	500

Table 2-2 Construction Phase Action and Limit Levels for Air Quality

Event	Action			
	ET	IEC	AR	Works Contractor
Action Level				
Exceedance for one sample	Identify source, investigate the causes of complaint and propose remedial measures; Inform IEC and AR; Repeat measurement to confirm finding; Increase monitoring frequency to daily.	Check monitoring data submitted by ET; Check Contractor's working method.	Notify Contractor.	Rectify any unacceptable practice; Amend working methods if appropriate.
Exceedance for two or more consecutive samples	Identify source; Inform IEC and AR; Advise the AR on the effectiveness of the proposed remedial measures; Repeat measurements to confirm findings; Increase monitoring frequency to daily; Discuss with IEC and Contractor on remedial actions required; If exceedance continues, arrange meeting with IEC and AR; If exceedance stops, cease additional monitoring.	Check monitoring data submitted by ET; Check Contractor's working method; Discuss with ET and Contractor on possible remedial measures; Advise the ET on the effectiveness of the proposed remedial measures; Supervise Implementation of remedial measures.	Confirm receipt of notification of exceedance in writing; Notify Contractor; Ensure remedial measures properly implemented.	Submit proposals for remedial to AR within three working days of notification; Implement the agreed proposals; Amend proposal if appropriate.

Event	Action			
	ET	IEC	AR	Works Contractor
Limit Level				
Exceedance for one sample	Identify source, investigate the causes of exceedance and propose remedial measures; Inform IEC, AR, Contractor and EPD; Repeat measurement to confirm finding; Increase monitoring frequency to daily; Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and AR informed of the results.	Check monitoring data submitted by ET; Check Contractor's working method; Discuss with ET and Contractor on possible remedial measures; Advise the AR on the effectiveness of the proposed remedial measures; Supervise implementation of remedial measures.	Confirm receipt of notification of exceedance in writing; Notify Contractor; Ensure remedial measures properly implemented.	Take immediate action to avoid further exceedance; Submit proposals for remedial actions to IEC within three working days of notification; Implement the agreed proposals; Amend proposal if appropriate.
Exceedance for two or more consecutive samples	Notify IEC, AR, Contractor and EPD; Identify source; Repeat measurement to confirm findings; Increase monitoring frequency to daily; Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; Arrange meeting with IEC and AR to discuss the remedial actions to be taken; Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and AR informed of the results; If exceedance stops, cease additional monitoring.	Discuss amongst AR, ET, and Contractor on the potential remedial actions; Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the AR accordingly; Supervise the implementation of remedial measures.	Confirm receipt of notification of exceedance in writing; Notify Contractor; In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; Ensure remedial measures properly implemented; If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	Take immediate action to avoid further exceedance; Submit proposals for remedial actions to IEC within three working days of notification; Implement the agreed proposals; Resubmit proposals if problem still not under control; Stop the relevant portion of works as determined by the AR until the exceedance is abated.

Table 2-3 Construction Phase Event and Action Plan for Air Quality

2.3 Operation Phase Odour Patrol

2.3.1 Odour patrol shall be conducted to detect if there is any potential odour nuisance due to the operation of the Project. The patrol shall be carried out by a team of at least two competent personnel while the maximum number of live chickens are in the holding areas.

Competent Person for Odour Patrol

2.3.2 The competent persons who will carry out the odour patrol shall:

- Have their individual odour threshold of n-butanol in nitrogen gas in the range of 20 to 80 ppb/v required by the European Standard Method (EN 13725);
- Be at least 16 years of age and willing and able to follow instructions;
- Be free from any respiratory diseases;
- Be engaged for a sufficient period to build up and monitor/detect at several monitoring location;
- Not be allowed to smoke, eat, drink (except water) or use chewing gum or sweets 30 minutes before and during odour patrol;
- Take great care no to cause any interference with their own perception or that of others by lack of personal hygiene or use of perfumes, deodorants, body lotions or cosmetics;
- Not communicate with each other about the results of their choices.

Odour Intensity

2.3.3 During the patrol, any odour characterised of that emitted from the PSC shall be identified. The perceived odour intensity which is divided into five levels shall be assess. The following odour intensity rating shall be adopted in the assessment during the odour patrol:

0 Not detected. No odour perceived or an odour so weak that it can not be easily characterised or described;

1 Slight identifiable odour, and slight chance to have odour nuisance;

2 Moderate identifiable odour, and moderate chance to have odour nuisance;

3 Strong identifiable, likely to have odour nuisance; and

4 Extreme severe odour, and unacceptable odour level.

2.3.4 Mean value of the odour intensity ratings assessed by the patrol team shall be reported, together with raw data. Location of odour patrol, temperature, wind speed, wind direction, relative humidity, odour characteristics and date/time of patrol shall also be recorded.

Monitoring Locations, Period and Frequency

2.3.5 Odour patrol shall be carried out at the ASRs as listed in ***Table 2-4*** and shown in ***Figure 2-1***. Based on modelling results, these are the ASRs at which odour levels are predicted to reach 1 OU or above during the operation of the PSC.

2.3.6 ***Table 2-4*** also establishes the monitoring period and frequency of the odour patrol. The ET shall seek the advice of the Operators to identify peak operation hours, such that monitoring is scheduled when the maximum number of live chickens are in the holding areas.

Odour Monitoring Location ID	Location	Monitoring Parameter	Monitoring Period	Frequency
A1a	Hung Kiu San Tsuen	Odour Intensity	Peak operation hours while maximum number of live chickens in the holding areas	Once per week during the first year of operation. Frequency to be reviewed afterward.
A3	Border District Police Headquarters	Odour Intensity	Peak operation hours while maximum number of live chickens in the holding areas	Once per week during the first year of operation. Frequency to be reviewed afterward.
A5a	Lee Ka Yuen	Odour Intensity	Peak operation hours while maximum number of live chickens in the holding areas	Once per week during the first year of operation. Frequency to be reviewed afterward.
A9	Village House 5	Odour Intensity	Peak operation hours while maximum number of live chickens in the holding areas	Once per week during the first year of operation. Frequency to be reviewed afterward.

Table 2-4 Operation Phase Odour Patrol Locations, Period and Frequency

2.3.7 The ET shall determine the most appropriate route for the odour patrol, although a suggested route is given in ***Figure 2-1***.

2.3.8 The status and locations of ASRs may change after issuing this Manual. In response to odour complaints, additional odour monitoring locations may be added, in which case the ET Leader shall propose updated monitoring locations and seek approval from the Project Proponent and EPD. Similarly, if odour is not detected during the first year of operation at an ASR, that ASR may be deleted, with the approval of the Project Proponent and EPD.

2.3.9 When alternative monitoring locations are proposed, the following criteria for the proposed locations, as far as practicable, shall be followed:

- To be located at the site boundary or such locations close to the major odour emission source;
- To be located close to the sensitive receivers; and
- Take into account the prevailing meteorological conditions.

Event and Action Plan

2.3.10 ***Table 2-5*** shows the Action and Limit (A/L) Levels to be used. Should exceedance of A/L Levels occur, the ET and the Operators shall undertake appropriate actions in accordance with the Event and Action Plan as shown in ***Table 2-6***.

Parameters	Action Level	Limit Level
Odour Intensity	When one documented complaint is received; or Odour Intensity of 2 is measured from odour patrol	When two or more documented complaints are received within a week; or Odour Intensity of 3 or 4 is measured from odour patrol

Table 2-5 Operation Phase Action and Limit Levels for Odour

Event	Action		
	ET	Government Agent / Term Contractor	Operator
Action Level	▪ Identify source and cause, based on complaint or odour patrol result ▪ Inform Government Agent / Term Contractor and Operators ▪ For complaint, confirm the validity of the complaint by following-up with complainant ▪ For odour patrol result, confirm validity by repeating odour patrol within 24 hours ▪ Assuming exceedance is valid, discuss findings with the Operators and propose remedial measures	▪ Ensure remedial measures are properly implemented	▪ Rectify any unacceptable practice, particularly in relation to the holding area ▪ Amend operational practice, if appropriate ▪ Implement remedial measures within two working days of agreeing with the ET
Limit Level	▪ Identify source and cause, based on complaint or odour patrol result ▪ Inform Government Agent / Term Contractor, Operators and EPD ▪ For complaint, confirm the validity of the complaint by following-up with complainant ▪ For odour patrol result, confirm validity by repeating odour patrol within 24 hours ▪ Assuming exceedance is valid, increase odour patrol to daily ▪ Carry out analysis of the Operators' procedures and operation of odour removal plant and equipment to determine possible mitigation and remedial measures to be implemented ▪ Agree proposals for remedial actions with the Government Agent / Term Contractor and Operators within three working days of confirming the validity of the exceedance ▪ Assess the effectiveness of the Operators' remedial action and keep Government Agent / Term Contractor and EPD informed of the results ▪ Resume odour patrol frequency to normal when no further exceedance is identified	▪ Ensure remedial measures are properly implemented ▪ If verified exceedance continues, consider what further / enhanced mitigation measures should be implemented	▪ Take immediate action to avoid further exceedances ▪ Rectify any unacceptable practice, particularly in relation to the holding area ▪ Amend operational practice, if appropriate ▪ Review the operation and efficiency of odour removal plant and equipment ▪ Provide additional / back-up odour removal plant and equipment, if necessary ▪ Implement remedial measures within two working days of agreeing with the ET ▪ Assess the effectiveness of the remedial measures and agree to additional measures with ET if measures are not effective

Table 2-6 Operation Phase Event and Action Plan for Odour Monitoring

Odour Complaint

2.3.11 When a complaint is received relating to odour nuisance, an Odour Complaint Form shall be completed and kept at the PSC. The form shall include but not limited to the following:

- Date and time of the complaint;
- Name and contact information of the complainant;
- Location of where the odour nuisance occurred;
- Characteristics of the odour;
- Odour intensity according ***paragraph 2.3.3***;
- Meteorological conditions including temperature, wind direction and speed, relative humidity at the time of the complaint; and
- Operation activities carried out at the PSC at the time of the nuisance occurred.

2.3.12 The responsible parties shall review the odour complaint register against the Action and Limit Levels for Odour (***Table 2-5***). If the operation of the PSC was confirmed to be the source of unpleasant odour, actions in accordance with the Event and Action Plan for Odour (***Table 2-6***) shall be undertaken.

2.4 Mitigation Measures

2.4.1 With reference to the EIA report, the recommended mitigation measures as described as below. An implementation schedule of the recommended environmental mitigation measures is summarised in ***Appendix 1***.

Construction Phase

2.4.2 The dust arising from the construction phase of the Project is controlled under the Air Pollution Control (Construction Dust) Regulation. This regulation defines several major dust emitting activities as 'notifiable works', such as:

- Construction of the foundation of a building; and
- Construction of the superstructure of a building.

2.4.3 It should be noted that the Works Contractor has a responsibility to notify EPD when undertaking any notifiable works prior to the commencement of such works. In addition, the Works Contractor is also required to fulfil specific dust control requirements given in the Regulation's Schedule for specific jobs.

2.4.4 The following good site management/practices are recommended to avoid/ minimise incidences of dust emission:

Site Boundary and Entrance

- Vehicle washing facilities including a high pressure water jet should be provided at every discernible or designated vehicle exit point; and
- The area at which vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous or hardcore material.

Haul Roads and Unpaved Areas

- Each and every main haul road should be paved with concrete, bituminous hardcore materials or metal plates, and kept clear of dusty materials; or
- Unpaved haul roads and areas should be sprayed with water so as to keep the entire road surface wet.

Excavated Materials

- Any stockpile of dusty material should be either: (a) covered entirely by impervious sheeting; (b) placed in an area sheltered on the top and the three sides; or (c) sprayed with water or a dust suppression chemical so as to maintain the entire surface wet.

Exposed Earth

- Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies.

Loading, Unloading or Transfer of Dusty Materials

- All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet.

Debris Handling

- Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides; and
- Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped.

Transport of Dusty Materials

- Vehicles used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards.

Site Clearance

- The working area for the uprooting of trees, shrubs, or vegetation or the removal of boulders, pole, pillars should be sprayed with water immediately before, during and immediately after the operation so as to maintain the entire surface wet; and
- All demolished items should be covered by impervious sheeting or placed in a spot with shelters on top and three sides within a day of the demolition.

2.4.5 Workers at all levels should be co-operative to avoid dust generation and dispersion to the surrounding environment.

2.4.6 With the implementation of the above mitigation measures and adequate water spraying to the unpaved haul roads and areas and general construction activities such as site clearance, excavation, dusty materials loading/unloading and debris handling, the dust emission from the construction sites would be reduced significantly and the construction dust impact imposed on the nearby ASRs would be insignificant.

Operation Phase

2.4.7 Dry or wet scrubbers are widely used for removing industrial odours. Scrubbers with high odour removal efficiencies of 95% are currently available on the market. It is considered that scrubbers are the most cost-effective means to remove odour. Therefore, it is recommended that either dry or wet type scrubbers with a minimum odour removal efficiency 95% (an efficiency level readily available in commercial equipment) should be provided for the PSC. All air ducted from Areas 1 to 6 should be passed through the air scrubber prior to being expelled from the PSC into the surrounding air.

2.4.8 Good management and operation practice should be implemented in order to eliminate odorous emission from the operation of the PSC. The following measures are recommended:

Live Poultry Unloading and Holding Areas

- Vehicles should be immediately driven to washing area after unloading;
- All cages and poultry should be sprayed with water immediately prior to unloading to reduce poultry mortality and to dampen dusty material; and
- High pressure water jets should be used to keep the floor surface free from feathers, faeces and other odorous materials from poultry.

Washing Area

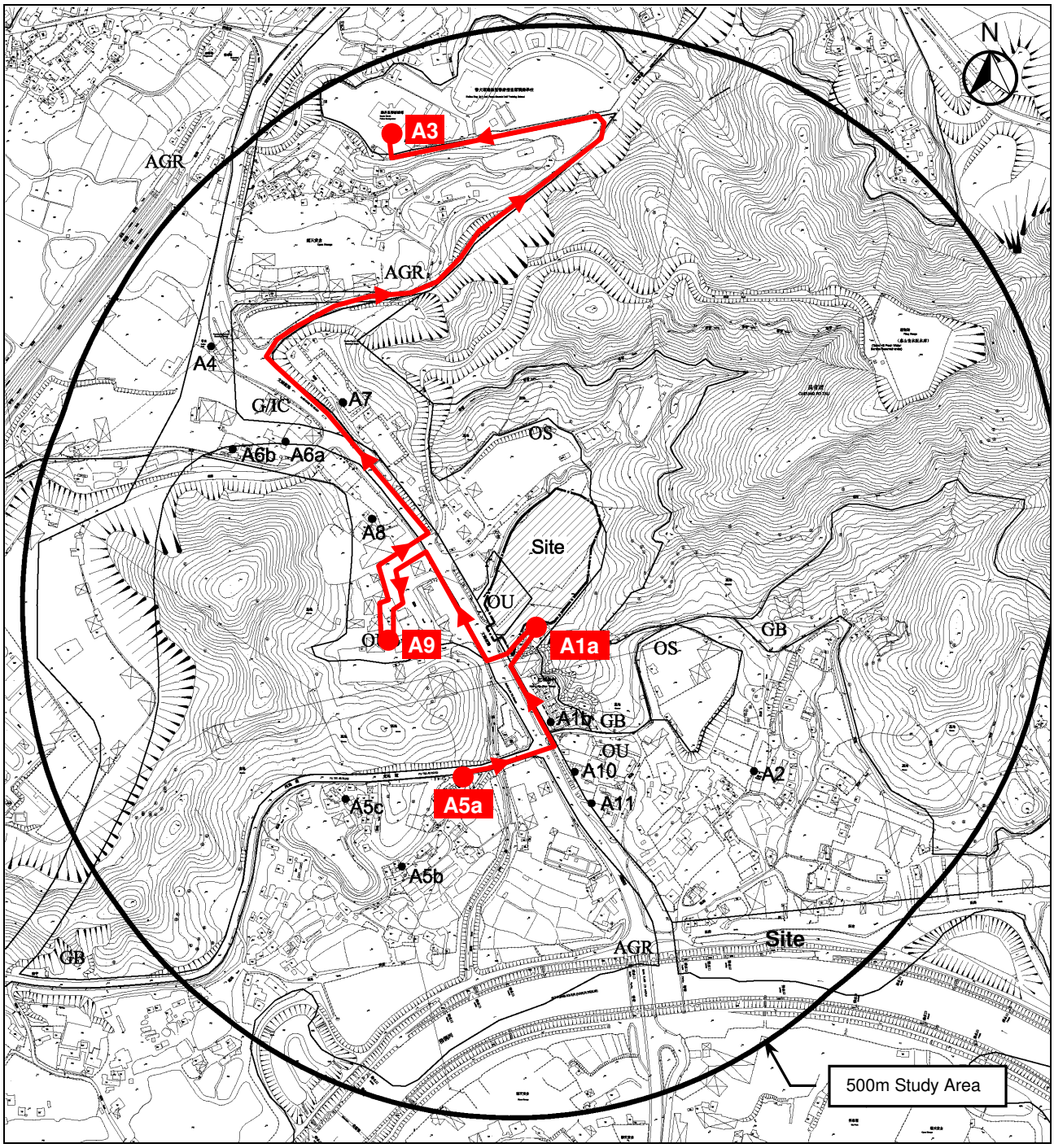
- After unloading poultry, vehicles shall be thoroughly washed by high pressure water jets at designated points before exiting the Site; and
- Used crates shall be washed and disinfected using an automatic crate washing machine. Clean crates shall then be loaded onto clean vehicles.

Slaughtering Plant

- Floors and equipment in the slaughtering and evisceration areas should be cleaned frequently by water spraying;
- Offal and feathers should be collected and transferred to designated temporary storage area immediately after slaughtering and evisceration processes; and
- Regular and proper maintenance of plant and equipment should be undertaken to ensure ventilation system and associated equipment is operating properly and achieving expected performance.

Waste Management and WTFs

- Offal, feathers, dead poultry and other odorous materials shall be stored in refuse bins with close-fitted lids. All refuse should be collected by waste collectors and disposed of frequently (e.g. daily);
- The waste collection frequency should be increased during summer and peak seasons (e.g. twice a day) if necessary;
- Equipment such as bar screens, containers and tanks should be frequently cleaned to prevent odours from accumulation of organic debris;
- Screened materials and sludge should be stored in the enclosed containers in order to minimise odour escape; and
- Sludge, greases and floating solids should be regularly removed in order to prevent putrefaction of accumulated organics in the tanks.



Legend:

- ASR for Odour Patrol
- Suggested Route for Odour Patrol

Figure 2-1 Odour Patrol Locations

3 NOISE

3.1 Introduction

3.1.1 The noise assessment in the EIA report indicates that no adverse noise impacts are expected from the either the construction and operation phases of the Project. Proper implementation of the environmental mitigation measures including good site practice and proper maintenance of Powered Mechanical Equipment (PME), as recommended in the EIA Report and ***Section 3.2*** of this Manual, shall be undertaken to further minimise any potential noise impacts from the Project.

3.1.2 However, construction noise monitoring to confirm that the recommended noise mitigation measures are effective to reduce construction noise at NSRs comply with relevant criteria is recommended. Operation noise monitoring is not required. Please note that in accordance with EPD's *Guidelines for Development Projects in Hong Kong – Environmental Monitoring and Audit*, published by EPD in 1998, pre-construction baseline noise monitoring is not required.

3.1.3 The EIA has demonstrated no unacceptable noise impacts will occur during the operation phase and so operational noise monitoring is not required.

3.2 Monitoring Parameters

3.2.1 The construction noise level shall be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{Aeq}). $L_{Aeq\ (30min)}$ shall be used as the monitoring parameter for the time period between 0700-1900 hours on normal weekdays. For all other time periods (including restricted hours), $L_{Aeq\ (5min)}$ shall be employed for comparison with the Noise Control Ordinance (NCO) criteria.

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

3.3 Monitoring Equipment

3.3.1 In accordance with the Technical Memorandum (TM) issued under the NCO, sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications 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 may be accepted as valid only if the calibration level from before and after the noise measurement agree to within 1.0dB.

3.3.2 The ET Leader shall be responsible for the provision, installation and maintenance of the monitoring equipment. He shall ensure that sufficient noise monitoring 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. The location of equipment installation should be proposed by the ET Leader and agreed with AR and EPD in consultation with the IEC.

3.3.3 Noise measurements should not be made in the presence of fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. A sample raw data sheet is shown in ***Appendix 3***.

3.3.4 All the monitoring equipment shall be regularly calibrated to ensure the accuracy. The calibration frequency for each equipment shall comply with the recommendation provided by the equipment manufacturer.

3.4 Monitoring Locations

3.4.1 One designated monitoring locations near the Project site have been identified as shown in ***Figure 3-1*** and listed in ***Table 3-1***.

3.4.2 The status and locations of noise sensitive receivers may change after issuing this Manual. If such case exists, the ET Leader shall propose updated monitoring locations and seek approval from AR, IEC and EPD. When alternative monitoring location is proposed, the following criteria, as far as practicable, shall be followed:

- At locations close to the major site activities which are likely to have noise impacts;
- Close to the noise sensitive receivers; and
- For monitoring locations in the vicinity of the sensitive receivers, care should be taken to avoid disturbance to the occupants during monitoring.

Noise Monitoring Location ID	Location
N1a	Hung Kiu San Tsuen

Table 3-1 Construction Phase Noise Monitoring Location

3.5 Construction Phase Impact Monitoring

3.5.1 During normal construction working hour (0700-1900 Monday to Saturday), monitoring of $L_{Aeq(30min)}$ noise levels (as six consecutive $L_{Aeq(5min)}$ readings) shall be carried out at the agreed monitoring locations once every week.

3.5.2 Other noise sources such as road traffic may make a significant contribution to the overall noise environment. Therefore, the results of noise monitoring activities shall take into account such influencing factors, which may not be presented during the baseline monitoring period.

3.5.3 In case of non-compliance with the construction noise criteria, more frequent monitoring as specified in the Event and Action Plan in the preceding section 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.

Event and Action Plan

3.5.4 The Action and Limit levels for construction noise are proposed in ***Table 3-2***. Should non-compliance of the criteria occur, actions in accordance with the Action Plan in ***Table 3-3*** shall be taken.

Time Period	Action	Limit
0700-1900 hrs on normal weekdays	When one documented complaint is received	75* dB(A)

Notes: * For any nearby schools, 70 dB(A) for schools and 65 dB(A) during school examination periods.
Subject to Area Sensitivity Ratings of the NSRs.

Table 3-2 Construction Phase Action and Limit Levels for Noise

3.6 Mitigation Measures

3.6.1 With reference to the EIA report, the recommended mitigation measures as described as below. The implementation schedule of the recommended environmental mitigation measures is summarised in ***Appendix 1*** of this Manual.

3.6.2 Good site practice as described below is recommended to adopt to further minimise the noise nuisance:

- Only well-maintained plant should be operated on site and the plant should be regularly serviced during the construction works;
- Plant that is used intermittently, should be turned off or throttled down when not in active use;
- Plant that is known to emit noise strongly in one direction should be orientated to face away from NSRs;
- Silencers, mufflers and enclosures for plant should be used where possible and maintained adequately throughout the works;
- Where possible mobile plant should be sited away from NSRs; and
- Stockpiles of excavated materials and other structures such as site buildings should be used effectively to screen noise from the works.

3.6.3 The EIA study also recommends the mitigation measures including the use of quiet PME and movable noise barriers in order to reduce construction noise impact at NSRs, particularly from PME items including generators, compressors and vibrators. The location of the required noise barrier is shown in ***Figure 3-1***.

3.6.4 A noise barrier located close to the noise generating component of a PME could reduce 10 dB(A) for stationary plant and 5 dB(A) from mobile plant, provided that the line of sight could be blocked by the barriers when viewed from the NSRs.

3.6.5 Noise barriers to be used on site shall be free of gaps and made of materials having a surface mass density of at least 15kg/m^2. To improve the effectiveness of noise reduction, absorptive lining can be adhered on the inner surface of the barrier in place. The barrier shall be in the form of vertical or bend top barrier with an effective height of 3m or above. Its length shall be long enough to cover the length of the PME to be protected. It is better to extend both ends of the barrier to exceed the size of the PME by a distance equal to the separation between the barrier and the PME.

Event	Action			
	ET Leader	IEC	AR	Operator
Action Level	▪ Notify IEC and the Operator. ▪ Carry out investigation. ▪ Report the results of investigation to IEC and the Operator. ▪ Discuss with the Operator and formulate remedial measures. ▪ Increase monitoring frequency to check mitigation measures.	▪ Review with analysed results submitted by ET. ▪ Review the proposed remedial measures by the Operator and advise ER accordingly. ▪ Supervise the implement of remedial measures.	▪ Confirm receipt of notification of exceedance in writing. ▪ Notify the Operator. ▪ Require the Operator to propose remedial measures for the analysed noise problem. ▪ Ensure remedial measures are properly implemented.	▪ Submit noise mitigation proposals to AR and IEC. ▪ Implement noise mitigation proposals.
Limit Level	▪ Identify the source. ▪ Notify IEC, AR, EPD and the Operator. ▪ Repeat measurement to confirm findings. ▪ Increase monitoring frequency. ▪ Carry out analysis of Operator's working procedures to determine possible mitigation to be implemented. ▪ Inform IEC, AR, and EPD the causes & actions taken for the exceedances. ▪ Assess effectiveness of the Operator's remedial actions and keep IEC, EPD and ER informed of the results. ▪ If exceedance stops, cease additional monitoring.	▪ Discuss amongst AR, ET Leader and the Operator on the potential remedial actions. ▪ Review the Operator's remedial actions whenever necessary to assure their effectiveness and advise AR, accordingly. ▪ Supervise the implementation of remedial measures.	▪ Confirm receipt of notification of exceedance in writing. ▪ Notify the Operator. ▪ Require the Operator to propose remedial measures for the analysed noise problem. ▪ Ensure remedial measures are properly implemented. ▪ If exceedance continues, consider what activity of the work is responsible and instruct the Operator to stop that activity of work until the exceedance is abated.	▪ Take immediate action to avoid further exceedance. ▪ Submit proposals for remedial actions to IEC within 3 working days of notification. ▪ Implement the agreed proposals. ▪ Resubmit proposals if problem still not under control. ▪ Stop the relevant activity of works as determined by AR, until the exceedance is abated.

Table 3-3 Construction Phase Event and Action Plan for Noise

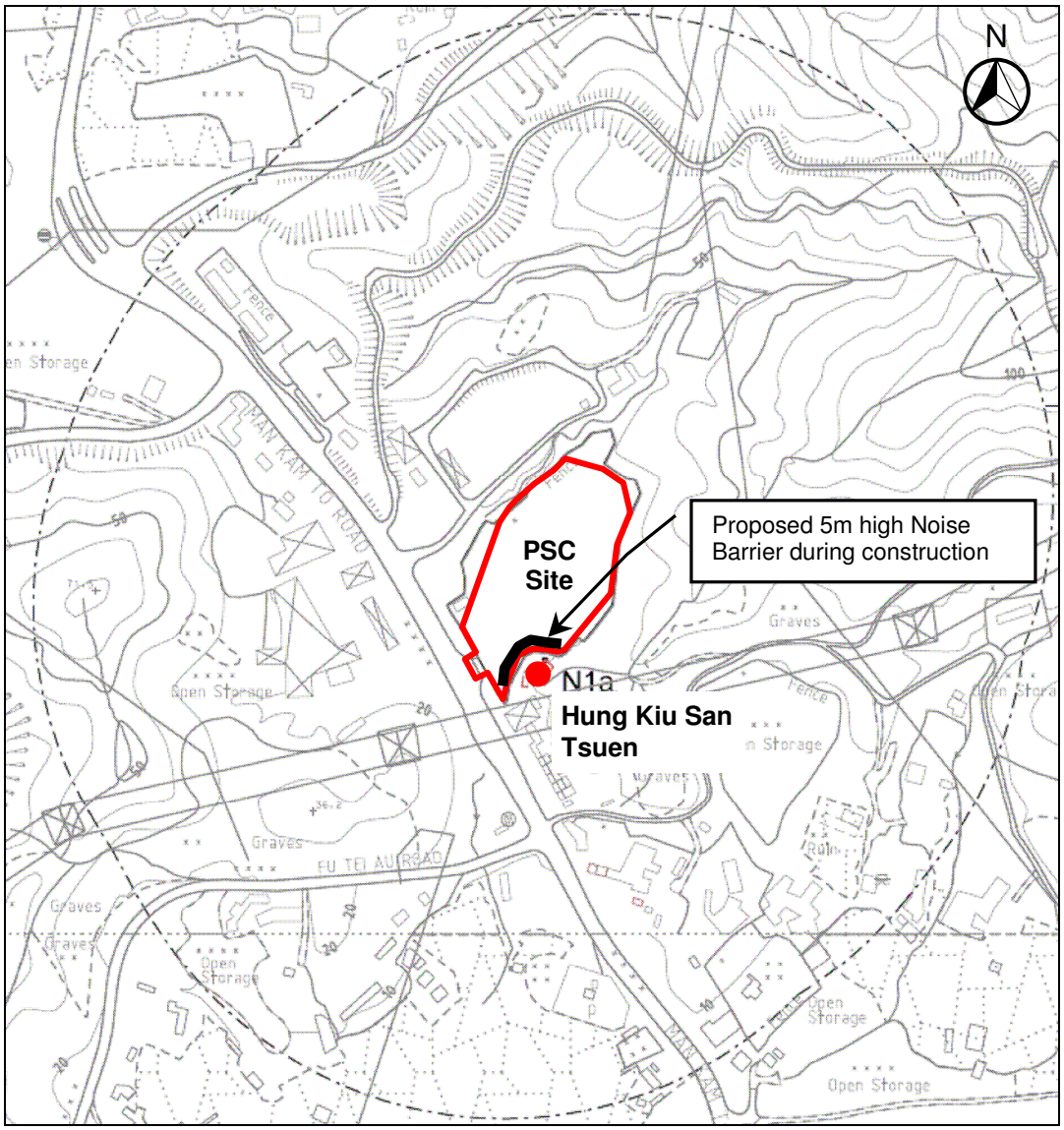


Figure 3-1 Construction Phase Noise Monitoring Location and Location of 5m High Temporary Barrier

4 WATER QUALITY

4.1 Introduction

4.1.1 The water quality assessment has considered the water quality impacts from the construction and operation of the PSC. No significant residual impact related to water quality is anticipated, provided that the recommended mitigation measures are properly implemented. The use of environmentally sound designs to achieve significant water-savings are strongly recommended.

4.1.2 Water quality monitoring for construction and operation phases shall be confined to the relevant effluent discharge licensing requirements to be issued by EPD under the Water Pollution Control Ordinance (WPCO). No additional monitoring is required.

4.1.3 Regular site audit, outlined in ***Section 5*** will serve to inspect the implementation status of the mitigation measures and ensure that any potential water quality impacts are detected and dealt with.

4.2 Mitigation Measures

Construction Phase

Construction Runoff and Drainage

4.2.1 Any effluent discharge from the Site is subject to control under a WPCO discharge licence, to be obtained by the Works Contractor. Wastewater shall properly be treated to meet the discharge standards set out in the relevant discharge licence. No direct discharge of site runoff into the adjacent open channel will be allowed.

4.2.2 Runoff and drainage shall be prevented or minimised in accordance with the following guidelines in ProPECC PN 1/94:

- Provision of perimeter channels to intercept storm runoff from outside the Site. These shall be constructed in advance of site formation works and earthworks;
- Sand/silt removal facilities such as sand traps, silt traps and sediment basins shall be provided to remove sand/silt particles from runoff to meet the requirements of the TM standard under the WPCO. These facilities shall be properly and regularly maintained;
- Careful programming of works to minimise soil excavation works during rainy seasons;
- Exposed soil surface shall be protected by paving as soon as possible to reduce the potential of soil erosion;
- Temporary access roads shall be protected by crushed gravel and exposed slope surfaces shall be protected when rainstorms are likely to occur;
- Trench excavation shall be avoided in the wet season as far as practicable, and, if necessary, these trenches shall be excavated and backfilled in short sections; and
- Open stockpiles of construction materials on Site shall be covered with tarpaulin or similar fabric during rainstorms.

4.2.3 The wheel washing facility ensures no earth, mud or debris is tracked off the Site and deposited on to Man Kam To Road. Sand and silt in the wash water from the wheel washing facility, shall be settled out and removed before discharging into the storm drain. Any section of the road between the wheel washing bay and Kam To Road shall be paved with a back-fall to prevent wash water or other site runoff from entering the public area.

4.2.4 Oil receptors shall be provided in the drainage system and regularly emptied to prevent the release of oil and grease into the storm drainage system after accidental spillage. The interceptor shall have a bypass to prevent flushing during periods of heavy rainfall.

General Construction Activities

4.2.5 Debris and rubbish generated on Site shall be collected, handled and disposed of properly to avoid them entering the open channel. All fuel tanks and storage areas shall be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. Open storm water drains and culverts near the works area shall be covered to block the entrance of large debris and refuse.

Sewage Generated from On-site Workforce

4.2.6 The sewage from construction work force is expected to be handled by portable chemical toilets. Appropriate and adequate portable toilets shall be provided by licensed Operators who shall be responsible for appropriate disposal of collected sewage and maintenance of these facilities.

Operation Phase

4.2.7 All liquid effluents generated by the operation of the PSC will be discharged off-site via foul sewer (leading to SWHSTW). Therefore, no adverse water quality impact to the WSR is expected from these sources.

4.2.8 Wastewater arising from the use of personal hygiene facilities, from floor washing, delivery lorry/crate washing and from the various slaughtering processes will require treatment in the on-site WTF.

4.2.9 Planned maintenance shutdown of the WTF will be scheduled for non-operational hours. Regular maintenance will minimise emergency shutdown. During emergency shutdown of the WTF, tankers will be used to remove wastewater from the PSC and deliver it directly to SWHSTW. Given that regular and preventative maintenance will be adopted, periods for emergency shutdown will likely be brief, and so the periods for tankering and volumes of wastewater to be tankered are not likely to be extensive. At no time will discharge of untreated effluent purely due to shutdown of the wastewater treatment facility occur.

5 LANDSCAPE AND VISUAL

5.1 Introduction

5.1.1 EIA study recommends that regular landscape monitoring and auditing during the construction and operation phases is required on site to ensure the existing trees retained on site are well preserved, vegetation removal operations are in accordance with requirements, procedures and specifications as stipulated in the contract and approvals granted by relevant authorities, and all newly planted vegetation is maintained properly during the establishment period.

5.2 Baseline Monitoring

5.2.1 A Registered Landscape Architect (RLA) (as a member of the ET) shall be responsible for conducting the baseline review and monitoring the implementation of visual mitigation measures during construction.

5.2.2 The ET should carry out baseline landscape and visual monitoring prior to the commencement of any construction works. The baseline monitoring should be conducted as a one-off site survey. Before commencing baseline monitoring, the ET should inform the Works Contractor, IEC, AR and EPD of the baseline monitoring schedule programme, such that relevant parties can conduct on-site audit, if desired, to ensure accuracy of the baseline monitoring results.

5.2.3 The purpose of the review is to:

- Check the status of each landscape resource, landscape character area and the view conditions of each Visual Sensitive Receiver (VSR), including glare;
- With reference to the recorded baseline conditions of the site described in ***Sections 10.5 and 10.7 of the EIA Report***, determine whether any change has occurred to the status of the visual resources since the EIA was completed;
- Describe any changes in terms of the parameters in ***Sections 10.6 and 10.8 the EIA Report***.
- Determine whether amendments in the design of the visual mitigation measures are required for those changes; and
- To recommend any necessary amendments to the design of the visual mitigation measures.

5.3 Construction Phase

Environmental Audit

5.3.1 Environmental audit of landscape and visual mitigation shall be undertaken monthly during the construction phase of the Project to ensure the implementation of mitigation measures are carried out. This also covers compensatory planting/tree relocation.

5.3.2 Conflicts between the proposed landscape and visual mitigation measures and other project works should be resolved at the earliest possible date without compromise to the mitigation intentions of these measures.

Event and Action Plan

5.3.3 Should non-compliance of the landscape and visual impacts occur during the construction phase, actions in accordance with the Event and Action Plan, shown in ***Table 5-1***, should be carried out.

5.4 Tree Preservation and Compensatory Planting

5.4.1 The Project Landscape Architect shall be responsible for inspection of the following:

- Retained trees are properly fenced off around the dripline of the trees and existing vegetation to be retained are properly maintained throughout construction period;
- Tree felling and transplanting operations are in accordance with para. 17(d) of ETWB TC(W) 3/2006;
- The new plantings provide screening effect and blend in with the existing environment;
- Compensatory tree planting shall be in the ratio of at least 1:1 in terms of quantity and quality. Species for compensation planting shall be *Juniperus chinensis*. As per the Airport Authority study "Hong Kong International Airport Approved Plant Species List" (Revision 3: June 2007), *Juniperus chinenis* is not considered to attract bird species.
- Existing off-site shrub and ground cover planting areas that are disturbed by the works shall be reinstated. Recommended plant selection for shrubs shall include, but not be limited to, the following native species: *Rhodomyrtus tomentosa*, *Rhaphiolepis indica*, *Gardenia jasminoides*, *Ilex asprella*, *Melastoma candidum*, and *Psychotria asiatica*.

5.5 Operation Phase

Environmental Audit

5.5.1 Environmental audit of landscape and visual mitigation measures shall be undertaken monthly by a RLA during the first year of the operation phase. This is to check the effectiveness of the mitigation measures and to ensure all new planting (including compensatory planting and transplantation) is properly established and maintained during the first 12 months of operation (the establishment period).

5.5.2 Types of reports to be prepared and submitted by the RLA during the first year of operation phase of the Project include monthly EM&A report and final EM&A review report. A copy of the monthly and final EM&A review reports shall be made available to the EP holder and EPD.

5.5.3 Subsequent to the completion of the establishment period, auditing and maintenance of landscape works shall be carried out by the maintenance agents identified in ***Section 5.7***.

Event and Action Plan

5.5.4 This is not required during the operation phase.

Action Level	Action			
	ET Leader	IEC	AR	Contractor
Non-conformity on one occasion	▪ Identify source ▪ Inform the IEC, AR and Contractor ▪ Discuss remedial actions with the IEC, the AR and the Contractor ▪ Monitor remedial actions until rectification is completed	▪ Check report ▪ Check the Contractor's working method ▪ Discuss with the AR and the Operator on possible remedial measures ▪ Advise the AR on effectiveness of proposed remedial measures	▪ Notify the Contractor ▪ Ensure remedial measures are properly implemented ▪	▪ Amend working methods ▪ Rectify damage and undertake remedial measures or any necessary replacement
Repeated Non-conformity	▪ Identify source. ▪ Inform IEC, AR and the Operator. ▪ Increase monitoring (site audit) frequency. ▪ Discuss remedial actions with the IEC, ER and Operator ▪ Monitor remedial actions until rectification is completed. ▪ If non-conformity stops, cease additional monitoring (site audit)	▪ Check report ▪ Check the Contractor's working method ▪ Advise the AR on effectiveness of proposed remedial measures ▪ Supervise implementation of remedial measures	▪ Notify the Contractor ▪ Ensure remedial measures are properly implemented	▪ Amend working methods ▪ Rectify damage and undertake remedial measures or any necessary replacement

Table 5-1 Construction Phase Event and Action Plan for Landscape and Visual

5.6 Mitigation Measures

5.6.1 In order to mitigate landscape and visual impacts, mitigation measures will be implemented. These can be categorised in the following groups:

- Construction areas;
- Tree preservation and planting;
- Reinstatement planting; and
- Building features.

5.6.2 ***Figure 5-1*** shows the locations for tree preservation, transplantation, compensatory planting and shrub reinstatement (where needed).

Mitigation Measures for Construction (MC):

5.6.3 **MC1.** Site offices and construction yards:

- Site offices shall have olive green roof and façade coating, colour shall match with the existing environment; and
- Site offices and the construction yard shall be decommissioned after construction.

5.6.4 **MC2.** Height of site offices:

- The height of site offices, including the rooftop shall not exceed 10m; and
- Building services equipment such as antennas may exceed 10m and should be coated in black.

5.6.5 **MC3.** Hoarding and screening:

- Where practical, the site offices, construction yards and storage areas shall be screened with hoarding along the peripheries of the site using colour in harmony with the surrounding environment until the completion of relevant construction phases.

5.6.6 **MC4.** Construction equipment and building material:

- Shall be orderly and carefully stored in order to appear neat and avoid visibility from outside where practical;
- Excess materials shall be removed from site as soon as practical; and
- All construction equipment shall be removed from site upon completion of construction works.

Mitigation Measures for Tree Preservation and Planting (MT)

5.6.7 **MT1.** Compensation for losses is anticipated. The tree compensation:tree loss ratio shall be at least 1:1 in terms of quantity. Species for compensation planting shall be *Juniperus chinensis*. As per the Airport Authority study"Hong Kong International Airport Approved Plant Species List" (Revision 3: June 2007), *Juniperus chinenis* is not considered to attract bird species.

5.6.8 **MT2.** As transplantation on site is not permissible, trees that require removal shall be transplanted off site.

5.6.9 **MT3.** Preservation:

- No tree shall be transplanted or felled without prior approval by relevant Government departments;
- Transplant preparation works shall be carried out as soon as possible after commencement of construction. Over-pruning such as hard pruning of tree crown, pollarding or topping shall be avoided. Rootball and crown pruning shall be carried out over at least 3 months, and
- Existing off-site shrub and ground cover planting areas that are disturbed by the works shall be reinstated. Recommended plant selection for shrubs shall include, but not be limited to, the following native species: *Rhodomyrtus tomentosa*, *Rhaphiolepis indica*, *Gardenia jasminoides*, *Ilex asprella*, *Melastoma candidum*, and *Psychotria asiatica*.

Mitigation Measures for the Proposed Building (MB)

5.6.10 **MB1.** External fence walls shall be finished with durable and easy to clean paint and shall be in a colour scheme which shall blend the new structure with the "green" environment. The colour scheme of the building shall also be in harmony with the surrounding environment as much as possible.

5.6.11 **MB2.** The building shall be in stepped height to distribute the building mass and avoid a "wall effect".

5.6.12 **MB3.** The building shall be composed of horizontal and vertical lines on the façade to reduce the apparent bulk of the building, materials such as glass and timber may be integrated into the design to add interest and variety to the design.

5.6.13 **MB4.** Flat roof areas shall be articulated to reflect horizontal and vertical lines of the façade to have an overall cohesive architectural design and so as to break the flatness. Colouring/finish shall allow blending with the surrounding environment.

5.6.14 **MB5.** Where possible, the roof profile shall be slightly pitched so as to add interest and so as to easily integrate with the surrounding hills.

5.6.15 **MB6.** Paving shall be designed to reflect the horizontal and vertical lines of the building and add interest to the PSC as seen from far and higher views.

5.7 Funding, Implementation and Maintenance Agencies

5.7.1 ***Table 5-2***, below, identifies the proposed funding, implementation and maintenance agencies for the proposed landscape and visual mitigation measures recommended above.

Project Phase	Funding Agency	Implementation Agency	Maintenance Agency
Construction	ArchSD	ArchSD /Works Contractor	n/a
Operation	FEHD	Government Agent / Term Contractor	Government Agent / Term Contractor

Table 5-2 Funding, Implementation and Maintenance Agencies for Landscape Works

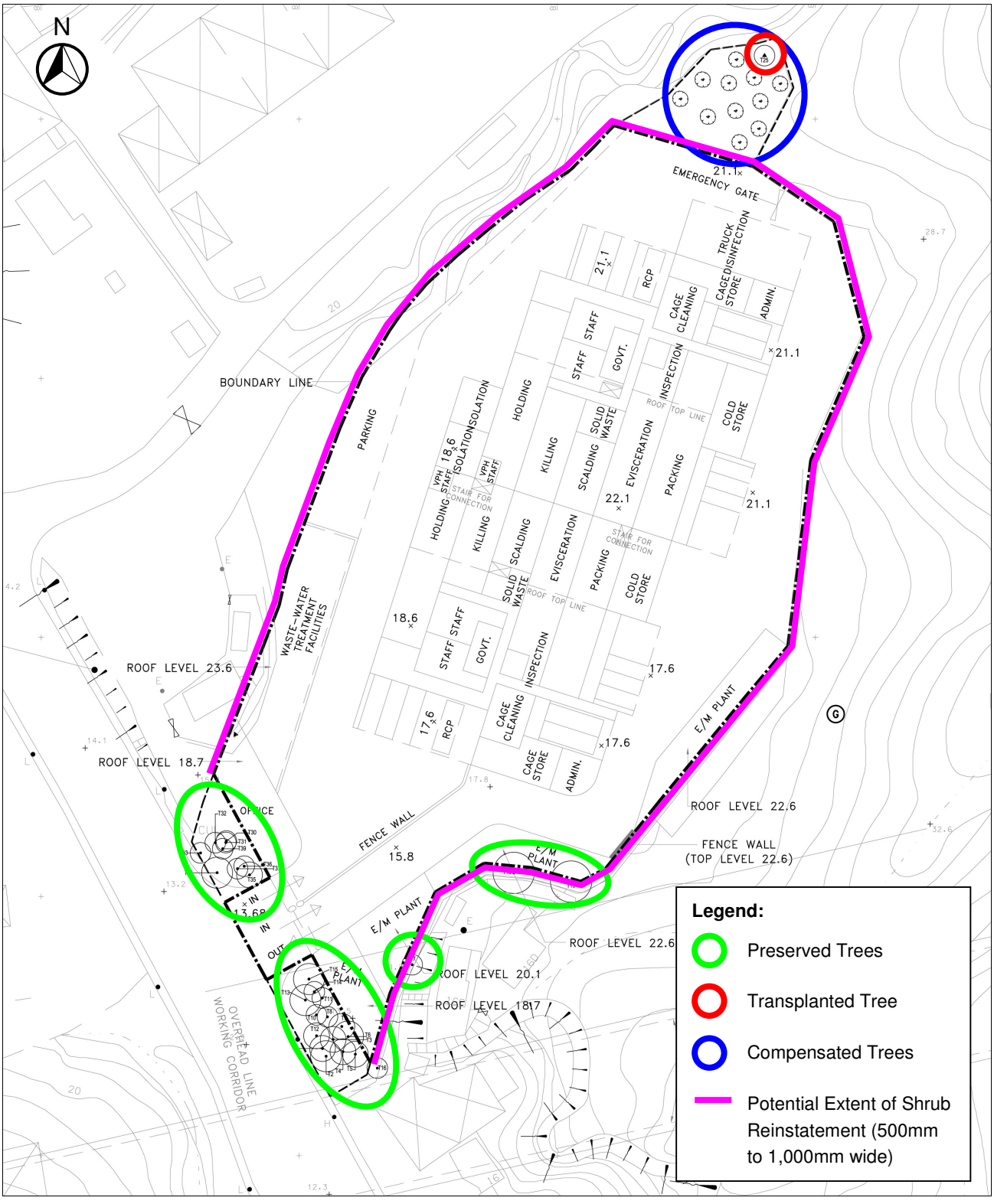


Figure 5-1 Location of Preserved Trees and Compensatory Planting / Transplanting

6 ENVIRONMENTAL AUDITING

6.1 Construction Phase

Site Audit

6.1.1 Site inspection provides a direct means to initiate and enforce specified environmental protection and pollution control measures. Inspections shall be undertaken routinely to inspect construction activities in order to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. Site inspection is one of the most effective tools to enforce the environmental protection requirements within the works area.

6.1.2 The ET Leader shall be responsible for formulating the environmental site inspection, the deficiency and action reporting system, and for carrying out the site inspection works. Within 21 days of the construction contract commencement, he shall submit a proposal for site inspection and deficiency and action reporting procedures to the Works Contractor for agreement, and to the AR for approval. The ET's proposal for rectification shall be agreed with the IEC.

6.1.3 Regular site inspections shall be carried out by the ET at least once per week. The scope of inspection shall not be limited to the environmental situation, pollution control and mitigation measures within the site; it shall also review the environmental situation outside the works area which is likely to be affected, directly or indirectly, by the site activities. The ET Leader shall make reference to the following information in conducting the inspection:

- EIA recommendations on environmental protection and pollution control mitigation measures;
- Works progress and programme;
- Individual works methodology proposals (which shall include pollution control measures);
- Contract specifications on environmental protection;
- Relevant environmental protection and pollution control laws; and
- Previous site inspection results.

6.1.4 The Works Contractor shall keep the ET Leader updated with all relevant information on the construction contract necessary for him to carry out the site inspections. Inspection results and associated recommendations for improvements to the environmental protection and pollution control works shall be submitted to the IEC and the Works Contractor within 24 hours after completion of the site inspection. The Works 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 Leader, to report on any remedial measures subsequent to the site inspections.

6.1.5 *Ad hoc* site inspections shall also be carried out 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.

Compliance with Legal and Contractual Requirements

6.1.6 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.

6.1.7 In order that the works are in compliance with the contractual requirements, all works method statements submitted by the Works Contractor to the AR for approval shall be sent to the ET Leader for vetting to see whether sufficient environmental protection and pollution control measures have been included.

6.1.8 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.

6.1.9 The Works Contractor shall regularly copy relevant documents to the ET Leader so that works checking can be carried out. The document shall at least include the updated Works Progress Reports, updated Works Programme, any application letters for different licence / permits under the environmental protection laws, and copies of all valid licences / permits. The site diary shall also be available for the ET Leader's inspection upon his request.

6.1.10 After reviewing the document, the ET Leader shall advise the IEC and the Works Contractor of any non-compliance with contractual and legislative requirements on environmental protection and pollution control in order for them to take follow-up action. If the ET Leader's review concludes that the current status on licence / permit application and any environmental protection and pollution control preparation works may result in potential violation of environmental protection and pollution control requirements, he shall also advise the Works Contractor and the AR accordingly.

6.1.11 Upon receipt of the advice, the Works Contractor shall undertake immediate action to correct the situation. The AR shall follow up to ensure that appropriate action has been taken by the Works Contractor in order to satisfy contractual and legal requirements.

Environmental Complaints

6.1.12 Complaints shall be referred to the ET Leader for action. The ET Leader shall undertake the following procedures upon receipt of any complaint:

- Log complaint and date of receipt onto the complaint database and inform the IEC immediately;
- Investigate the complaint to determine its validity, and assess whether the source of the problem is due to works activities;
- Identify mitigation measures if a complaint is valid and due to works;
- Advise the Works Contractor if mitigation measures are required;
- Review the Works Contractor 's response to the identified mitigation measures, and the updated situation;
- If the complaint is transferred from EPD, submit interim report to EPD on status of the complaint investigation and follow-up action within the time frame assigned by EPD;

- Undertake additional monitoring and audit to verify the situation if necessary, and review that circumstances leading to the complaint do not recur;
- Report investigation results and subsequent actions to complainant (if the source of complaint is transferred from EPD, the results shall be reported within the timeframe assigned by EPD); and
- Record the complaint, investigation, the subsequent actions and the results in the monthly EM&A reports.

6.2 Operation Phase

6.2.1 Site audit for the operation phase is not required, other than in connection with the operation phase odour patrol (see ***Section 2.3***).

7 REPORTING

7.1 General

7.1.1 The ET Leaders shall prepare and certify the Baseline, Construction and Operation EM&A Reports in accordance with the following reporting requirements. The following report requirements are based upon a paper documented approach, however, the same information can be provided in an electronic form upon agreeing the format with the Project Proponent and EPD. This would enable a transition from a paper/historic and reactive approach to an electronic/real time and proactive approach.

7.1.2 The types of reports that the ET Leaders shall prepare and submit include baseline monitoring report (pre-construction phase), monthly EM&A report, quarterly EM&A summary report and final EM&A review report (construction and operation phases). In accordance with Appendix 21 of the EIAO-TM, a copy of the monthly, quarterly summary and final review EM&A reports shall be made available to the Director of Environmental Protection.

7.2 Baseline Monitoring Report

7.2.1 The ET Leader shall prepare and submit a Baseline Environmental Monitoring Report within 10 working days of completion of the baseline monitoring (pre-construction phase). Copies of the Baseline Environmental Monitoring Report shall be submitted to the Works Contractor, the IEC, the AR and EPD. The ET Leader shall liaise with the relevant parties on the exact number of copies they require. The report format and baseline monitoring data format shall be agreed with EPD prior to submission.

7.2.2 The baseline monitoring report shall include at least the following:

- Up to half a page executive summary;
- Brief Project background information;
- An updated construction programme with milestones of environmental protection / mitigation activities annotated;
- Drawings showing locations of the baseline monitoring stations;
- 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.
- Details of 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 the monitoring results.

- Determination of the Action and Limit Levels for each monitoring parameter and statistical analysis of the baseline data;
- Revisions for inclusion in the EM&A Manual; and
- Comments, recommendations and conclusions.

7.3 Monthly EM&A Reports

7.3.1 The results and findings of all EM&A work required by this Manual shall be recorded in the monthly EM&A reports prepared by the ET Leaders (Construction and Operation Phases). The EM&A report shall be prepared and submitted within the time period as specified in the EP (generally should be 2 weeks or 10 working days of the end of each reporting month), with the first report due no later than two months after construction or operation commences.

7.3.2 During the Construction Phase, each monthly EM&A report shall be submitted to the Works Contractor, the IEC, the AR and EPD. During the Operation Phase, each EM&A Report shall be submitted to the Project Proponent, the Government Agent / Term Contractor and EPD.

7.3.3 Before submission of the first EM&A report, the ET Leaders shall liaise with the parties on the required number of copies and format of the monthly reports in terms of hard copy and / or electronic format.

7.3.4 The ET Leaders 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.

7.3.5 The monthly EM&A reports shall include at least the following:

- Executive summary:
  - Breaches of Action and Limit levels;
  - Complaint log;
  - Notifications of any summons and successful prosecutions;
  - Reporting changes; and
  - Future key issues.
- Basic Project information:
  - Project organisation including key personnel contact names and telephone numbers;
  - Construction programme with fine tuning of construction activities showing the inter-relationship with environmental protection / mitigation measures for the month (construction phase only);
  - Management structure; and
  - Work undertaken during the month.
- Environmental status:
  - Work undertaken during the month (with illustrations), such as location of works, percentage of fines in the fill material used, etc. (construction phase only); and
  - Drawings showing the Project area, any environmental sensitive receivers and the locations of the monitoring and control stations (with co-ordinates of the monitoring locations).

- 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 for the Project; and
  - Environmental requirements in Contract documents.
- Implementation status - advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the EIA Report for the Project, summarized in the updated implementation schedule.
- Monitoring results (in both hard and softcopies) 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;
  - Graphical plots of the monitored parameters in the month (construction phase only) annotated against;
    - The major activities being carried out on site during the period;
    - Weather conditions that may affect the results;
    - Any other factors which might affect the monitoring results; and
  - QA/QC results and detection limits.
- Report on non-compliance, complaints, and notifications of summons and successful prosecutions:
  - Record of all non-compliance (exceedances) with the Action and Limit levels);
  - Record of all complaints received (written or verbal) for each media, including locations and nature of complaints, 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 legislation, 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 non-compliance.
- Others
  - An account of the future key issues as reviewed for the works programme and work method statements (construction phase only);
  - Advice on solid and liquid waste management status (construction phase only); and
  - Summary on the implementation status of environmental mitigation measures, proactive environmental mitigation measures, environmental licensing and permits

status, environmental monitoring schedule and complaint log summarising the EM&A of the period.

7.3.6 Monthly EM&A reports other than the first report shall also include the following:

- 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 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; and
- Details of complaints, outstanding issues and deficiencies.

7.4 Quarterly EM&A Summary Reports

7.4.1 A quarterly EM&A report shall be prepared and submitted within 10 working days of the end of each reporting quarter. The quarterly EM&A summary report shall contain at least the following information:

- Executive summary;
- Basic Project information including a synopsis of the Project organisation, programme, contacts of key management, and the work undertaken during the quarter;
- A brief summary of EM&A requirements including:
  - Monitoring parameters;
  - Environmental quality performance limits (Action and Limit levels); and
  - Environmental mitigation measures, as recommended in the EIA Report for the Project;
- Advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the EIA Report for the Project, summarised in the updated implementation schedule;
- Drawings showing the Project area, any environmental sensitive receivers and the locations of the monitoring and control stations;
- Graphical plots of any trends of monitored parameters over the past four months (the last month of the previous quarter and the present quarter) for representative monitoring stations annotated against the following:
  - The major activities being carried out on site during the period;
  - Weather conditions during the period; and
  - Any other factors which might affect the monitoring results;
- Advice on the solid and liquid waste management status;
- A summary of non-compliance (exceedances) with the Action and Limit levels;

- A brief review of the reasons for and the implications of any non-compliance, including a review of pollution sources and working procedures;
- A summary description of actions taken in the event of non-compliance and any follow-up procedures related to any earlier non-compliance;
- A summarised record of all complaints received (written or verbal), liaison and consultation undertaken, actions and follow-up procedures taken;
- A summary record of notification of summons and successful prosecutions for breaches of the current environmental protection / pollution control legislations, locations and nature of the breaches, investigation, follow-up actions taken and results;
- Comments (e.g. effectiveness and efficiency of the mitigation measures), recommendations (e.g. any improvement in the EM&A programme) and conclusions for the quarter; and
- Proponents' contacts and any hotline telephone number for the public to make enquiries.

7.5 Final EM&A Review Reports

7.5.1 The termination of EM&A programme shall be determined on the following basis:

- Completion of construction activities and insignificant environmental impacts of the remaining outstanding construction works (construction phase only);
- Trends analysis to demonstrate the reduction of monitoring exceedances due to construction activities and the return to ambient environmental conditions comparable with baseline data (construction phase only);
- Completion of the first year of operation (operation phase only); and
- No unsolved environmental complaint and prosecution.

7.5.2 The proposed termination may be subject to consultation with the local community and the proposal shall be endorsed by the IEC and AR (Construction Phase only) and also by and the Project Proponent prior to final approval from EPD.

7.5.3 The final EM&A report shall include, inter alia, the following information:

- Executive summary;
- Drawings showing the Project area, any environmental sensitive receivers and the locations of the monitoring stations;
- Basic Project information including a synopsis of the Project organisation, contacts of key management, and the work undertaken during the entire construction period;
- A brief summary of EM&A requirements including:
  - Monitoring parameters;
  - Environmental quality performance limits (Action and Limit levels); and
  - Environmental mitigation measures, as recommended in the EIA Report for the Project;
- Advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the EIA Report for the Project, summarised in the updated implementation schedule;

- Graphical plots of the trends of monitored parameters over the construction period for representative monitoring stations annotated against the following:
  - 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; and
  - The return of ambient environmental conditions in comparison with baseline data;
- Compare and contrast the EM&A data with the EIA predictions and annotate with explanation for any discrepancies;
- Provide clear-cut decisions on the environmental acceptability of the Project with reference to the specific impact hypothesis;
- Advice on the solid and liquid waste management status;
- A summary of non-compliance (exceedances) with the Action and Limit levels;
- A review of the reasons for and the implications of non-compliance including review of pollution sources and working procedures as appropriate;
- A description of the actions taken in the event of non-compliance and any follow-up procedures related to earlier non-compliance;
- A summary record of all complaints received (written or verbal), liaison and consultation undertaken, actions and follow-up procedures taken;
- Review the monitoring methodology adopted and with the benefit of hindsight, comment on its effectiveness (including cost effectiveness);
- A summary record of notifications of summons and successful prosecutions for breaches of the current environmental protection / pollution control legislation, locations and nature of the breaches, investigation, follow-up actions taken and results;
- A review of the practicality and effectiveness of the EIA process and EM&A programme (e.g. effectiveness and efficiency of the mitigation measures). Recommendation of any improvement in the EM&A programme; and
- A conclusion to state the return of ambient and / or the predicted scenario as per EIA findings.

7.6 Data Keeping

7.6.1 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 kept by the ET Leader and be ready for inspection upon request.

7.6.2 All relevant information shall be clearly and systematically recorded in the document. Monitoring data shall also be recorded in electronic form, and the software copy must be available upon request. Data format shall be agreed with EPD.

7.6.3 All documents and data shall be kept by the ET Leader for at least one year following completion of the EM&A programme.

7.7 Interim Notifications of Environmental Quality Limit Exceedances

7.7.1 With reference to the Event and Action Plans, when the environmental quality performance limits are exceeded, the ET Leaders shall immediately notify the AR and the IEC (Construction Phase only) and EPD, as appropriate.

7.7.2 The notification shall be followed up with the ET Leaders' advice to 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 4***.

7.8 Electronic Reporting of EM&A Information

7.8.1 Electronic copies of all reports shall be prepared in Hyper Text Markup Language (HTML) (version 4.0 or later) and in Portable Document Format (PDF version 4.0 or later), unless otherwise agreed by EPD and shall be submitted to EPD along with the hard copies.

7.8.2 For the HTML version, a content page capable of providing hyperlink to each section and sub-section of these reports shall be included in the beginning of the document. Hyperlinks to all figures, drawings and tables in these reports shall be provided in the main text from where the respective references are made.

Appendix 1

Project Implementation Schedule

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages* D	C	O	Relevant Legislation and Guidelines
Air (Construction Phase)							
3.7.2	The Works Contractor has a responsibility to notify EPD when undertaking any notifiable works prior to the commencement of such work In addition, the Works Contractor is also required to fulfil specific dust control requirements given in the Regulation's Schedule for specific job	Prior to 'notifiable' works including Construction of the foundation of a building and construction of the superstructure of a building	Works Contractor		✓		Air Pollution Control (Construction Dust) Regulation APCO
3.7.3	Good site management / practices to avoid / minimise incidences of dust emissions: Site Boundary and Entrance: ▪ Vehicle washing facilities including a high pressure water jet should be provided at every discernible or designated vehicle exit point. ▪ The area at which vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous or hardcore material. Access Haul Roads and Unpaved Areas: ▪ Each and every main haul road should be paved with concrete, bituminous hardcore materials or metal plates, and kept clear of dusty material or ▪ Unpaved haul roads and areas should be sprayed with water so as to keep the entire road surface wet. Excavated Materials: ▪ Any stockpile of dusty material should be either: (a) covered entirely by impervious sheeting. (b) placed in an area sheltered on the top and the three side or (c) sprayed with water so as to maintain the entire surface wet. Exposed Earth: ▪ Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen within six months of the last construction activity on the part of the site where the exposed earth lie	Project Site / Construction Phase	Works Contractor		✓		Air Pollution Control (Construction Dust) Regulation APCO

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages* D	C	O	Relevant Legislation and Guidelines
	▪ Loading, Unloading or Transfer of Dusty Materials: ▪ All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet. Debris Handling: ▪ Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three side ▪ Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped. Transport of Dusty Materials: ▪ Vehicles used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboard Site Clearance: ▪ The working area for the uprooting of trees, shrubs, or vegetation or the removal of boulders, pole, pillars should be sprayed with water immediately before, during and immediately after the operation so as to maintain the entire surface wet. ▪ All demolished items should be covered by impervious sheeting or placed in a spot with shelters on top and three sides within a day of the demolition.						
12.1.4	Conduct weekly site audits during construction to ensure that appropriate dust mitigation is being implemented effectively and in accordance with recommendations in the EIA.	Project Site / Construction Phase	Works Contractor		✓		APCO
Air (Operation Phase)							
3.7.12	An odour removal system comprising scrubbers and/or ionizers and/or biofilters should be installed with a minimum combined odour removal efficiency of 95%, with devices used singly or in series. All air ducted from Areas 1 to 5 and Area 6 should be passed through the odour removal system prior to being expelled into the surrounding air.	Design and Operation Phases	Designer / Operator	✓		✓	EIAO-TM

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*			Relevant Legislation and Guidelines
				D	C	O	
3.7.13	Good management and operation practice to eliminate odour emissions: Unloading and Holding Areas of Live Poultry ▪ Trucks should be immediately driven to washing area after unloading. ▪ All cages and poultry should be sprayed with water immediately prior to unloading in order to eliminate poultry mortality and keep the dusty material wet. ▪ High pressure water jet shall be regularly used to spray over the floor surface to keep floor surfaces free from feathers, faeces and other odorous material Washing Area ▪ Empty trucks should be immediately and completely washed by high pressure water jets at designated points before exiting the site. Slaughtering Plant ▪ Floors and equipments in slaughtering and evisceration areas should be cleaned frequently by water spraying; ▪ Offal and feathers should be collected and transferred to designated temporary storage area immediately after slaughtering and evisceration processes; and ▪ Regular and proper maintenance should be undertaken to ensure ventilation system and equipments operating properly and achieving expected performance Waste Management and WTF ▪ Offal, feathers, dead poultry and other odorous materials shall be stored in refuse bins with close-fitted lid All refuses should be collected by waste collectors and disposed of frequently (e.g. daily); ▪ The waste collection frequency should be increased during summer and peak seasons (e.g. twice a day) if necessary; ▪ Equipment such as bar screen, containers and tanks should be frequently cleaned to prevent odours from accumulation of organic debris; ▪ Screened materials and sludge should be stored in the enclosed containers in order to minimise odour escape; and ▪ Sludge, greases and floating solids should be regularly removed in order to prevent putrefaction of accumulated organics in the tank	PSC / Operation Phase	Operator			✓	N/A

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*			Relevant Legislation and Guidelines
				D	C	O	
12.2.2	Conduct odour monitoring by means of odour patrols during the first year of operation, and thereafter in response to any complaint related to odour.	ASRs in the vicinity of Project Site / Operation Phase	Operator			✓	N/A
Noise (Construction Phase)							
4.8.1	Good Site Practice: ▪ Only well-maintained plant should be operated on site and the plant should be regularly serviced during the construction work ▪ Plant used intermittently should be turned off or throttled down when not in use. ▪ Plant that is known to emit noise strongly in one direction should be oriented to face away from NSR ▪ Silencers, mufflers and enclosures for plant should be used where possible and maintained adequately throughout the work ▪ Mobile plant should be sited away from NSR ▪ Stockpiles of excavated materials and other structures such as site buildings should be used effectively to screen noise from the work	Project Site / Construction Phase	Works Contractor		✓		EIAO-TM, GW-TM & NCO
4.8.3	Use of specific quiet PME as specified in ***Table 4-14 of the EIA report***: ▪ Breaker with a sound power level (SWL) of 106dB(A); ▪ Bulldozer with a SWL of 109dB(A); ▪ Concrete lorry mixer with a SWL of 100dB(A); ▪ Concrete pump with a SWL of 106; ▪ Excavator/loader with a SWL of 105dB(A); ▪ Generator with a SWL of 95dB(A); ▪ Mobile crane with a SWL of 101dB(A); ▪ Vibratory poker with a SWL of 102dB(A); ▪ Vibratory roller with a SWL of 102dB(A).	Project Site / Construction Phase	Works Contractor		✓		EIAO-TM, GW-TM & NCO

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*			Relevant Legislation and Guidelines
				D	C	O	
4.8.6 to 4.8.8 & Figure 3-2 in this EM&A Manual	Use of movable barriers for screening noise from generator, compressor and vibrator. Noise barriers to be used on site should be free of gaps and made of materials having surface mass density of at least 15 kg/m^2. Absorptive lining should be adhered on the inner surface of the barrier. The barrier should be in the form of vertical or bend top barrier with an effective height of 3m or above. Its length should be long enough to cover the length of the PME.	Project Site / Construction Phase	Works Contractor		✓		EIAO-TM, GW-TM & NCO
12.1.2	Conduct construction noise monitoring	NSRs in the vicinity of Project Site / Construction Phase	Works Contractor		✓		N/A
Noise (Operation Phase)							
4.8.15	It is recommended to provide the following mitigation measures: ▪ A noise reduction of -20 dB(A) for ventilation fans (full enclosure + isolators). ▪ A noise reduction of -25 dB(A) for air-cooled chillers (full enclosure + isolators + silencers). ▪ Quieter truck/forklift for loading/unloading activities with a SWL of not higher than 83 dB(A).	Design Phase	Designer	✓			NCO & EIAO-TM
Water Quality (Construction Phase)							
5.7.1 to 5.7.4	Construction Runoff and Drainage ▪ Wastewater shall be properly treated to meet the discharge standards set out in the relevant WPCO discharge licence. No direct discharge of site runoff permitted. ▪ Provision of perimeter channels to intercept storm runoff from outside the Site. These shall be constructed in advance of site formation works and earthwork ▪ Sand/silt removal facilities such as sand traps, silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the Technical Memorandum standard under the WPCO. These facilities shall be properly and regularly maintained. ▪ Works shall be carefully programmed to minimise soil excavation works during rainy season.	Project Site / Construction Phase	Works Contractor		✓		ProPECC PN 1-94 & WPCO

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages* D	C	O	Relevant Legislation and Guidelines
	▪ Exposed soil surface shall be protected by paving as soon as possible to reduce the potential of soil erosion. ▪ Temporary access roads shall be protected by crushed gravel and exposed slope surfaces shall be protected when rainstorms are likely to occur. ▪ Trench excavation shall be avoided in the wet season as far as practicable, and if necessary, these trenches shall be excavated and backfilled in short section ▪ Open stockpiles of construction materials on Site shall be covered with tarpaulin or similar fabric during rainstorms. ▪ Sand/silt in water from the wheel from the wheel washing facility shall be settled out before discharging into the storm drain. Any section of the road between the wheel washing bay and Man Kam To Road shall be paved with a back-fall to prevent wash water or other site runoff from entering public areas. ▪ Oil receptor shall be provided in the drainage system and regularly emptied to prevent the release of oil and grease into the storm drainage system after accidental spillage.						
5.7.5	General Construction Activities ▪ Debris and rubbish generated on Site shall be collected, handled and disposed of properly to avoid them entering the open channel. ▪ All fuel tanks and storage areas shall be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. ▪ Open storm water drains and culverts near the works area shall be covered to block the entrance of large debris and refuse.	Project Site / Construction Phase	Works Contractor		✓		WPCO
5.7.6	Sewage from On-site Workforce ▪ Portable chemical toilets shall handle the sewage from construction work force. Licensed Works Contractors who shall be responsible for appropriate disposal and maintenance of these facilities shall provide appropriate and adequate portable toilets and carry out maintenance of these facilities.	Project Site / Construction Phase	Works Contractor		✓		WPCO

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*			Relevant Legislation and Guidelines
				D	C	O	
Sewerage and Sewage Treatment							
6.2.28	Construct dedicated twin rising mains from the PSC directly to SWHSTW. Twin pipes of at least 100mm diameter are proposed but this should be confirmed by the Designer when maximum hourly flows have been established.	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		WPCO/EIAO-TM
6.2.29	Two pumps (one duty, one standby) plus a sump of adequate capacity will need to be constructed within the Site. Twin rising mains should also be provided to ensure that the rising mains are maintainable without shutting down.	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		WPCO/EIAO-TM
6.2.32	Although Alignment C has been assumed in the EIA, it is the decision of the Designer/ Works Contractor as to which alignment is adopted. The Designer shall be required to carry out a land ownership survey to confirm whether the adopted alignment encroaches on private land – this confirmation shall be included in a Sewerage Impact Assessment (SIA) prepared by the Designer, based on his design.	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		WPCO/EIAO-TM
6.3	The wastewater generated from the PSC shall be treated at the WTFs prior to discharge. The Designer shall carry out his own calculations of loading and flow rates, based on configuration, plant and equipment comprising his detailed design of the WTFs.	PSC / Design and Operation Phases	Designer / Operator	✓		✓	WPCO/EIAO-TM
6.6.4	The suggested configuration, estimated loading and flow rates and conceptual designs contained in this EIA shall not pre-empt or constrain the future detailed design of the sewerage and/or WTF by the Designer, nor shall they supplant specifications provided in any future contract documents.	PSC / Design and Operation Phases	Designer / Operator	✓			WPCO/EIAO-TM
Waste Management (Construction Phase)							
7.7.3	The Works Contractor should prepare and implement a Waste Management Plan, which becomes a part of the Environmental Management Plan.	Project Site / Construction Phase	Works Contractor		✓		ETWB TC(W) No. 19/2005
7.7.4	The Designer should reduce the amount of waste generated through optimising his design.	Design Phase	Designer	✓			N/A
7.7.5	Inert C&D Material (termed “public fill”) should be sent to the Fill Bank at Tuen Mun Area 38 for subsequent off-site reuse.	Project Site / Construction Phase	Works Contractor		✓		N/A

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*			Relevant Legislation and Guidelines
				D	C	O	
7.7.6 & 7.7.12	For the disposal of C&D Material, the trip-ticket system should be put in place. Copies/counterfoils from trip tickets shall be kept for record purpose.	Project Site / Construction Phase	Works Contractor		✓		ETWB TC(W) No.31/2004
7.7.7	Use of metallic site hoardings and signboards that related to environmental-responsible construction methods, waste reduction, reuse and recycling.	Project Site / Construction Phase	Works Contractor		✓		WBTCs, such as WBTC No. 19/2001
7.7.8 & 7.7.19	Plant/equipment maintenance schedules should be designed to optimise maintenance and thereby minimise the generation of chemical waste.	Project Site / Construction Phase	Works Contractor		✓		N/A
7.7.9	Chemical waste that is collected should be transported off-site for treatment by a licensed collector. The Operator should register with EPD as a chemical waste producer.	Project Site / Construction Phase	Works Contractor		✓		WDO
7.7.10	The Works Contractor should implement an education programme for workers relating to avoiding, reducing, reusing and recycling MSW.	Project Site / Construction Phase	Works Contractor		✓		N/A
7.7.11	Non-inert C&D Materials (termed construction waste) should be disposed of at NENT landfill.	Project Site / Construction Phase	Works Contractor		✓		N/A
7.7.15	Residual, non-recyclable, MSW should be stored in appropriate containers prior to collection and off-site disposal at NENT landfill	Project Site / Construction Phase	Works Contractor		✓		N/A
7.7.22	Regular collection should be made by an approved waste collection contractor in purpose-built Refuse Collection Vehicles that minimise environmental impacts during transportation.	Project Site / Construction Phase	Works Contractor		✓		N/A
Waste Management (Operation Phase)							
7.8.7	Operators should register with EPD as a chemical waste producer and provide on-site collection and storage.	PSC / Operation Phase	Operator			✓	WDO
7.8.8	Recycle waste lubricants into new products at an appropriate facility. Solid chemical wastes that cannot be recycled should be disposed at an appropriate facility.	PSC / Operation Phase	Operator			✓	WDO
7.8.12	Implement an education programme for staff relating to avoiding, reducing, reusing and recycling MSW. This should include provision of three colour recycling bins throughout the PSC and posters/leaflets showing the correct use of recycling bin Collected materials should be sold to recycler.	PSC / Operation Phase	Operator			✓	N/A

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*			Relevant Legislation and Guidelines
				D	C	O	
7.8.13	Provide on-site collection and storage of residual, non-recyclable, MSW. This waste should be stored in appropriate containers prior to off-site disposal at NENT landfill	PSC / Operation Phase	Operator			✓	N/A
7.8.14	Poultry waste is considered to be Special Waste. Any poultry waste that is not reused or recycled should be stored in hygienic conditions prior to collection and transportation to an off-site disposal facility.	PSC / Operation Phase	Operator			✓	WDO
7.8.15	Store poultry waste in sealed containers in a waste storage room that is well ventilated and extracted air treated to remove odour prior to release.	PSC / Operation Phase	Operator			✓	N/A
7.8.19	Any dust collected by the air pollution control equipment must be tested to ensure compliance for landfill disposal. If compliant, then the Practice Note for disposal of dusty waste at landfill sites and the Admission Ticket system should be followed. If not acceptable for direct landfill disposal, then the dust should be considered as chemical waste and treated and disposed of accordingly.	PSC / Operation Phase	Operator			✓	WDO / Practice Note for disposal of dusty waste at landfill sites
7.8.20	Copies/counterfoils from collection receipts issued by the licensed chemical waste collector should be kept for record purpose	PSC / Operation Phase	Operator			✓	WDO
7.8.22	Sludge should be disposed of at NENT landfill, or at any future dedicated sludge treatment facility. Copies/counterfoils from collection receipts issued by the licensed sludge collector shall be kept for record purpose	PSC / Operation Phase	Operator			✓	WDO
7.8.23	Residual, non-recyclable, MSW should be stored in appropriate containers prior to collection and off-site disposal at NENT landfill, which is the nearest landfill to the PSC. Copies/counterfoils from collection receipts issued by the nominated general waste collector shall be kept for record purpose	PSC / Operation Phase	Operator			✓	WDO
7.8.26	Environmental/hygiene mitigation measures should be followed at the landfill: ▪ Animal carcasses should be preferably sealed in plastic bags and transported in enclosed compartments; ▪ Decaying and offensive carcasses must be deposited into pre-excavated trench. Fresh carcasses should be deposited at the base of the tipping face; ▪ Inform the landfill staff of the trench requirements three days before the actual deposition date; ▪ Slightly offensive decaying carcasses should be generously sprinkled with lime;	Landfill / Operation Phase	Landfill Operator			✓	Practice Note for the Disposal of Animal Carcasses at Landfill Sites

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages* D	C	O	Relevant Legislation and Guidelines
	▪ Allow at least 0.5m clear at the top of the trench for immediate backfilling with soil. Carcasses at the tipping face should be immediately covered with domestic refuse or soil; ▪ No person should be allowed to enter and/or work inside the trenches; ▪ Avoid direct skin contact or accidental ingestion of animal tissue, fluid or blood; ▪ No smoking or sources of ignition; and ▪ Disposal operations should be supervised by trained personnel. All persons handling carcasses should wear suitable protective clothing and should be equipped with hand-hook The equipment should be cleaned afterward						
7.8.27	Chemical wastes should be stored in appropriate containers in a covered area. "No Smoking" signs should be clearly displayed to prevent accidental ignition of any flammable material Drip trays capable of storing 110% of the volume of the largest container should be used to mitigate possible leakage. Whenever the drip trays contain the maximum number of containers, a registered chemical waste collector should transport the containers to the appropriate treatment or disposal facility.	PSC / Operation Phase	Operator			✓	WDO
7.8.28	Sludge should be collected by a licensed collector at regular intervals, as determined by the operation of the WTF.	PSC / Operation Phase	Operator			✓	WDO
7.8.30	Residual, non-recyclable, MSW should be stored in appropriate container Regular collection should be made by an approved waste collector in RCVs that will minimise the potential for environmental impacts during transportation.	PSC / Operation Phase	Operator			✓	WDO
Land Contamination							
8.10.2	A health and safety plan should be prepared that covers aspects such as the discovery of large amounts of stained and odourous soils, underground tanks and other hazardous materials that may have been deposited at the Site.	Project Site / Construction Phase	Works Contractor		✓		EIAO-TM
8.10.3	If suspected contaminated materials are discovered during the construction works, the Project Proponent shall carry out a Land Contamination Assessment and submit the relevant reports to EPD for endorsement prior to the commencement of any construction works within the Site. Relevant reports would include a Contamination Assessment Plan (CAP), Contamination Assessment Report (CAR), Remediation Action Plan (RAP) and Remediation Report (RR).	Project Site / Construction Phase	Works Contractor		✓		Guidance Manual for Use of Risk-Based Remediation Goals for Contaminated Land Management

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*			Relevant Legislation and Guidelines
				D	C	O	
8.10.4	The conceptual model in the EIA report should be reviewed if further information is obtained or the planned change of use is altered.	Project Site / Design and Construction Phases	Designer / Works Contractor	✓	✓		EIAO-TM
8.10.5	Should fuel tanks be required for the operation of the PSC, these should be located above ground, with a bund beneath, to prevent undetected leakage.	Project Site / Design and Construction Phases	Designer / Works Contractor	✓	✓		EIAO-TM
Human Health Risk							
Table 9-1 Level 2a	Cross-contamination between transport of incoming live poultry and outgoing dressed poultry products: ▪ The layout of the PSC shall be designed to separate vehicles bringing in live poultry and vehicles collecting dressed poultry products ▪ Provision of sufficient on-site parking / queuing space	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		EIAO-TM
Table 9-1 Level 2a	Crate Washing: Pathogenic bacterial contamination of non-contaminated poultry: ▪ Provision of a semi-enclosed “Lorry Unloading Area” within the PSC building	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		EIAO-TM
Table 9-1 Level 2a	Vehicle Washing: Pathogenic bacterial contamination of non-contaminated poultry: ▪ Provision of a “Vehicle Washing Area” within the PSC building	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		EIAO-TM
Table 9-1 Level 2a	Odours, bioaerosols and other airborne contaminants escaping in an uncontrolled and untreated manner from the PSC: ▪ Air drawn from within the PSC shall pass through an odour removal system before being exhausted, to avoid odour impacts ▪ Ventilation hood systems and devices must be sufficient in number and capacity to prevent grease or condensation from collecting on walls and ceilings ▪ Heating, ventilation, and air conditioning systems must be designed and installed so that make-up air intake and exhaust vents do not cause contamination of food, food-contact surfaces, equipment, or utensils	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		EIAO-TM

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*			Relevant Legislation and Guidelines
				D	C	O	
Table 9-1 Level 2a	Wastewater generated from cleaning of crates and vehicles and from slaughtering activities escaping in an uncontrolled and untreated manner from the PSC ▪ WTFs shall be designed to meet the *Standards for Effluents Discharged into Foul Sewers Leading into Government Sewage Treatment Plants with Microbial Treatment in Deep Bay WCZ*, i.e., discharge to SWHSTW ▪ A dedicated foul sewer shall be constructed from the PSC to SWHSTW to directly convey effluent from the PSC	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		WPCO-TM DSD Sewerage Manual (Part 2) – Pumping Station and Rising Mains
Table 9-1 Level 2a	Presence of wild animals in close proximity to the PSC could act as disease vectors: ▪ A boundary wall (minimum 2m) will enclose the site, thereby deterring wild animals from walking/crawling into the PSC site from the surrounding environment and so reducing the risk of transferring disease from the wild to the PSC and vice versa	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		EIAO-TM
Table 9-1 Level 2b	Overall physical structures: ▪ The premises should be painted with durable and light coloured paint that is easy to clean ▪ All ceilings must be constructed and finished as to prevent condensation, leakage, and formation of moulds can be easily cleaned ▪ Walls, floors, ceiling partitions and doors must be constructed with smooth and durable materials impervious to moisture ▪ Windows and all openings must be constructed and meshed to prevent the entrance of dust and pests, such as flies, rats and mice ▪ Floors must be made of non-slip materials, evenly graded to prevent water stagnation ▪ Proper signage should be provided for demarcation and instructions	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		EIAO-TM
Table 9-1 Level 2b	Stressed poultry in the holding area and overcrowding will lead to more rapid spread of infection between poultry: ▪ The holding areas shall be constructed such that waste and dirty water are drained into a manure sump ▪ Effective drainage should be ensured to enable proper cleaning of the area	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		EIAO-TM

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages* D	C	O	Relevant Legislation and Guidelines
	▪ The holding areas shall be shall be provided with air-conditioning that meets operational needs – provision of wall/ceiling mounted fans will assist in improving air circulation ▪ The holding areas shall be designed to accommodate a maximum number of 25,350 poultry (approximately 13,000 per stall)						
Table 9-1 Level 2b	Cross-contamination between live and slaughtered poultry: ▪ The slaughtering areas shall be physically separated from the holding area ▪ The packaging and storage areas are classified as clean areas and shall be physically separated from the slaughtering areas ▪ Offices and reception areas shall be physically separated from the rooms and areas in which poultry are processed, handled and stored ▪ A staff room shall be provided for the workers to take meals, rest and for recreational purposes. The room should be physically separated from poultry holding area and other processing areas	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		EIAO-TM
Table 9-1 Level 2b	Cross-contamination between healthy and infected poultry: ▪ Separate rooms shall be provided within the PSC building for pre-slaughter testing and post-mortem examination of poultry pending avian influenza testing results and requiring detailed inspection, respectively ▪ An Isolation Room will be provided to quarantine poultry suspected of being infected. The Isolation room will be fitted with a separate ventilation system	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		EIAO-TM
Table 9-1 Level 2b	Bioaerosols and other airborne contaminants released during slaughtering into a confined environment: ▪ The PSC shall be operated at negative pressure, with the ventilation system designed to draw air from the relatively clean areas (e.g. the packing areas) into dirty areas (e.g. the holding areas) ▪ The rate of air changes within the various operational rooms in the PSC shall prevent air from stagnating and shall draw in clean air into each room ▪ Indoor areas shall be provided with air-conditioning that meets operational needs	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		EIAO-TM

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*			Relevant Legislation and Guidelines
				D	C	O	
Table 9-1 Level 2b	Design of manual, semi-automated or fully automated slaughtering machines: ▪ The slaughtering machines and equipment shall be designed to meet industry best practice standards ▪ Any conveyors shall use materials that are microbe-resistant and easily cleaned and disinfected ▪ Materials that are used in the construction of utensils, equipment and any food-contact surfaces, should not allow the migration of deleterious substances or impart colour, odour, or taste to food and under normal use conditions must be safe and non-toxic, durable, corrosive resistant, and non-absorbent; sufficient in weight and thickness to withstand repeated washing; finished to have a smooth, light-coloured, easily cleanable surface; resistant to pitting, chipping, scratching distortion and decomposition ▪ All wastewater shall be treated by the on-site WTF ▪ Equipment shall be provided to ensure all poultry are rendered unconscious prior to neck-cutting for animal welfare and to avoid struggling and consequential spraying of blood, which may splash on workers ▪ The neck-cutting process shall be designed such that contact between workers and poultry blood is minimised to the maximum possible extent. In an automated or semi-automated system, such protection is built-in and worker involvement is minimal. To achieve this protection in a manual system, suitable design is required, e.g. provision of screening at appropriate locations	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		EIAO-TM WPCO-TM
Table 9-1 Level 2b	Provision of personal hygiene facilities throughout the PSC: ▪ Washrooms will be provided throughout the PSC, such that workers do not need to move between clean areas and dirty areas. Provision will be in accordance with Building Regulations and the exact number will be determined during detailed design ▪ Hand-washing basins equipped with non-hand operated taps, which supply both hot and cold water, will be provided at various working points – the exact number will be determined during detailed design ▪ Showers will also be provided for workers – the exact number will be determined during detailed design	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations Practice Note for Authorized Persons and Registered Structural Engineers 297 (PNAP 297)

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*			Relevant Legislation and Guidelines
				D	C	O	
Table 9-1 Level 2b	Cold Storage: ▪ Built-in cold stores will be provided to store a minimum of 19,900 dressed poultry	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		EIAO-TM
Table 9-1 Level 2b	Storage rooms for non-food items: ▪ A store room for clean items, such as wrapping or packing materials must be provided	PSC / Design and Construction Phases	Designer / Works Contractor	✓	✓		EIAO-TM
Landscape & Visual (Construction Phase)							
10.9.2	MC1. Site offices and construction yards: ▪ Site offices shall have olive green roof and façade coating, colour shall match with the existing environment ▪ Site offices and the construction yard shall be decommissioned after construction	PSC / Construction Phase	Works Contractor		✓		
10.9.3	MC2. Height of site offices: ▪ The height of site offices, including the rooftop shall not exceed 10m ▪ Building services equipment such as antennas may exceed 10m and should be coated in black	PSC / Construction Phase	Works Contractor		✓		
10.9.4	MC3. Hoarding and screening. Where practical, the site offices, construction yards and storage areas shall be screened with hoarding along the peripheries of the site using colour in harmony with the surrounding environment until the completion of relevant construction phases	PSC / Construction Phase	Works Contractor		✓		
10.9.5	MC4. Construction equipment and building material: ▪ Shall be orderly and carefully stored in order to appear neat and avoid visibility from outside where practical ▪ Excess materials shall be removed from site as soon as practical ▪ All construction equipment shall be removed from site upon completion of construction works	PSC / Construction Phase	Works Contractor		✓		

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*			Relevant Legislation and Guidelines
				D	C	O	
Landscape & Visual (Tree Preservation and Planting)							
10.9.6	MT1. Compensation for losses is anticipated. The tree compensation:tree loss ratio shall be at least 1:1 in terms of quantity. Species for compensation planting shall be *Juniperus chinensis*. As per the Airport Authority study "Hong Kong International Airport Approved Plant Species List" (Revision 3: June 2007), *Juniperus chinenis* is not considered to attract bird species.	PSC / Construction Phase	Works Contractor		✓		
10.9.7	MT2. As transplantation on site is not permissible, trees that require removal shall be transplanted off site to the location identified.	PSC / Construction Phase	Works Contractor		✓		
10.9.8	MT3. Preservation: ▪ No tree shall be transplanted or felled without prior approval by relevant Government departments ▪ Transplant preparation works shall be carried out as soon as possible after commencement of construction. Over-pruning such as hard pruning of tree crown, pollarding or topping shall be avoided. Rootball and crown pruning shall be carried out over at least 3 months ▪ Existing off-site shrub and ground cover planting areas that are disturbed by the works shall be reinstated. Plant selection for shrubs has been recommended	PSC / Construction Phase	Works Contractor		✓		
Landscape & Visual (Building)							
10.9.9	MB1. External fence walls shall be finished with durable and easy to clean paint and shall be in a colour scheme, which shall blend the new structure with the "green" environment. The colour scheme of the building shall also be in harmony with the surrounding environment as much as possible	PSC / Design Phase	Designer	✓			
10.9.10	MB2. The building shall be in stepped height to distribute the building mass and avoid a "wall effect"	PSC / Design Phase	Designer	✓			
10.9.11	MB3. The building shall be composed of horizontal and vertical lines on the façade to reduce the apparent bulk of the building, materials such as glass and timber may be integrated into the design to add interest and variety to the design	PSC / Design Phase	Designer	✓			

EIA Ref	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*			Relevant Legislation and Guidelines
				D	C	O	
10.9.12	MB4. Flat roof areas shall be articulated to reflect horizontal and vertical lines of the façade to have an overall cohesive architectural design and so as to break the flatness. Colouring/finish shall allow blending with the surrounding environment	PSC / Design Phase	Designer	✓			
10.9.13	MB5. Where possible, the roof profile shall be slightly pitched so as to add interest and so as to easily integrate with the surrounding hills	PSC / Design Phase	Designer	✓			
10.9.14	MB6. Paving shall be designed to reflect the horizontal and vertical lines of the building and add interest to the PSC as seen from far and higher views	PSC / Design Phase	Designer	✓			

Note: * D = Design, C = Construction, O = Operation

Appendix 2

Sample Template for Construction Dust Monitoring

Construction Dust Monitoring – Raw Data Sheet

Project		Provision of a Poultry Slaughtering Centre in Sheung Shui
Monitoring Location		
Details of Location		
Sampler Identification		
Date & Time of Sampling		
Elapsed-time Meter Reading	Start (min.)	
	Stop (min.)	
Total Sampling Time (min.)		
Weather Conditions		
Site Conditions		
Initial Flow Rate, Qsi	Pi (mmHg)	
	Ti (°C)	
	Hi (in.)	
	Qsi (Std. m^3)	
Final Flow Rate, Qsf	Pf (mmHg)	
	Tf (°C)	
	Hf (in.)	
	Qsf (Std. m^3)	
Average Flow Rate (Std. m^3)		
Total Volume (Std. m^3)		
Filter Identification No.		
Initial Wt. of Filter (g)		
Final Wt. of Filter (g)		
Measured TSP Level (µg/m^3)		

	Name	Designation	Signature	Date
Recorded by		ET Field Operator		
Checked by		ET Laboratory Staff		
Data Entered by		ET Data Entry Staff		

Appendix 3

Sample Template for Construction Noise Monitoring

Construction Noise Monitoring – Raw Data Sheet

Project	Provision of a Poultry Slaughtering Centre in Sheung Shui
Monitoring Location	
Description of Location	
Date of Monitoring	
Weather Condition	Sunny/Fine/Cloudy/Rainy _____^{0}C
Wind Strength (m/s)	

Equipment	Model No.	Serial No.
Sound Level Meter		
Sound Pressure Calibrator		

Calibration before measurement (dB (A))	
Calibration after measurement (dB (A))	

Measurement Start Time								
Measurement Time Length (min)								
Measurement Results (dB (A))	1st	2nd	3rd	4th	5th	6th	Average	Façade Correct
L_{eq}								
L_{10}								
L_{90}								
Major Construction Noise Source(s) During Measurement								
Other Noise Source(s) During Measurement								
Remarks	Free Field / Façade							

	Name	Designation	Signature	Date
Recorded by		ET Field Operator		
Data Entered by		ET Data Entry Staff		

Appendix 4

Sample Template for Incident Reporting

Incident Report for Action Level or Limit Level Non-compliance

Project	Provision of a Poultry Slaughtering Centre in Sheung Shui
Date	
Time	
Monitoring Location	
Parameter	
Action & Limit Levels	
Measured Level	
Possible reason for Action or Limit Level Non-compliance	
Actions taken / to be taken	
Remarks	

	Name	Designation	Signature	Date
Prepared by		ET Leader		