MTR Corporation Limited

Sheung Shui to Lok Ma Chau Spur Line

Updated Environmental Monitoring and Audit (EM&A) Manual

(Revision B)

(October 2022)

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Date: 25 October 2022

MTR Corporation Limited

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1 Introduction

1.1 Background

1.1.1 The Environmental Impact Assessment (EIA) report for "Sheung Shui to Lok Ma Chau Spur Line" (Register No.: AEIAR-052/2002) (i.e. hereafter called the approved EIA for LMC Spur Line) conducted by Kowloon-Canton Railway Corporation (KCRC) was approved in 2002, and addressed the environmental impacts caused by the LMC Spur Line. As far as the railway station at Kwu Tung is concerned, the approved EIA for LMC Spur Line had considered the potential construction and operational impacts for the railway station at Kwu Tung enabling works including the station box structure. Sensitive receivers in the vicinity of the railway station at Kwu Tung at that time included village houses along Ma Tso Lung Road and Ho Sheung Heung Road, Fairy Park, Dills Corner Garden. Appendix 1.1 shows the demarcation of the station box structure of railway station at Kwu Tung structure adopted in the approved EIA Report for LMC Spur Line.

1.1.2 Civil Engineering and Development Department (CEDD) / Planning Department (PlanD) subsequently conducted an EIA for North East New Territories New Development Areas which was approved in 2013 (i.e. hereafter called EIA for NENT NDA). This EIA for NENT NDA covered a total of 2 new development areas (NDAs) including the one in Kwu Tung North (KTN). Unlike the EIA for LMC Spur Line, the EIA for NENT NDA proposed new developments including high-rise public and private housings, educational institutes, social welfare facilities, open space, etc in the vicinity of the railway station at Kwu Tung. Subsequent to the approval of EIA for NENT NDA, the respective project proponent (i.e. CEDD) is currently implementing the site formation works for the NDAs and other infrastructures, including those at KTN.

1.1.3 In December 2020, the MTR Corporation Limited (i.e. MTRCL, hereafter called the Project Proponent) was invited by the Government to commence the detail planning and design of the railway station at Kwu Tung (i.e. hereafter called the Project).

1.1.4 The construction and operation of the LMC Spur Line constitutes to Item A.2 Designated Project (DP) "A railway and its associated stations", under Part I Schedule 2 of Environmental Impact Assessment Ordinance (EIAO). KCRC had applied for and had been granted numbers of Environmental Permits (EPs) and Further Environmental Permits (FEP) for its construction and operation of LMC Spur Line, including the existing tunnel box and enabling works.

1.1.5 The EP (EP No. EP-129/2002/H) held by KCRC includes the construction and operation of a railway and its associated stations while that of the FEP held by

MTRCL (EP No. FEP-06/129/2002/H) includes the operation of a railway and its associated stations.

1.1.6 In order to expand the scope of the FEP (No. FEP-06/129/2002/H) held by MTRCL to cover the construction and operation of the proposed railway station at Kwu Tung, variation of this FEP would be required.

1.1.7 In order to demonstrate no unacceptable impacts will be resulted from the Project, and no exceedance or violation of environmental performance requirement as set out in the approved EIA for LMC Spur Line, the Environmental Review Report (ERR) had been prepared and submitted under the VEP application. The VEP application had been approved and a new Environmental Permit (No. FEP-06/129/2002/I) was granted by EPD on 24 December 2021.

1.2 Description of the Project

1.2.1 A brief summary of the key elements of the Project is given below:

- Excavation of the fill material above the existing tunnel box;
- Modification of existing tunnel box structures;
- Construction of concourse and platform areas;
- Construction of back-of-house areas;
- Construction of entrances, Ventilation Buildings (VB) and Fire Rescue Stairs (FRS);
- Modification of existing Emergency Access Point (EAP)/ Emergency Egress Point (EEP);
- Relocation of existing EVA and associated facilities; and
- Construction of other station associated facilities and underground adit.

1.2.2 The location of the Project is shown in **Figure 2.1**.

1.3 Purpose of the Manual

1.3.1.1 According to the new EP (No. FEP-06/129/2002/I) Condition 2.8, the Permit Holder shall update the Environmental Monitoring and Audit (EM&A) Manual to include the latest EM&A requirements in accordance with the information and recommendations described in the EIA Report (Register No. AEIAR-052/2002) and the attachments (i.e. ERR) submitted for application for VEP and by taking into account any specific site conditions that may be changes prior to construction commencement of the Kwu Tung Station.

1.3.1.2 The purposes of this updated EM&A Manual are to:

- Guide the update of an EM&A programme to ensure compliance with the ERR recommendations;
- Specify the requirements for monitoring equipment;
- Propose environmental monitoring points, monitoring frequency, etc.;
- Propose Action and Limit Levels; and
- Propose Event and Action Plans.

1.3.2 This Manual outlines the monitoring and audit programme for the construction and operation of the Project and provides systematic procedures for monitoring, auditing and minimizing environmental impacts.

1.3.3 Hong Kong environmental regulations have served as environmental standards and guidelines in the preparation of this Manual. In addition, this updated EM&A Manual has been prepared in accordance with the requirements stipulated in Annex 21 of the Technical Memorandum on the EIA Process (EIAO-TM).

1.3.4 This Manual contains the following information:

- Responsibilities of the Contractor, the Engineer or Engineer's Representative (ER), Environmental Team (ET), and the Independent Environmental Checker (IEC) under the context of EM&A;
- Project organization for the EM&A works;
- The basis for, and description of the broad approach underlying the EM&A programme;
- Details of the methodologies to be adopted, including all laboratories and analytical procedures, and details on quality assurance and quality control programme;
- The rationale on which the environmental monitoring data will be evaluated and interpreted;
- Definition of Action and Limit Levels;
- Establishment of Event and Action Plans;
- Requirements for reviewing pollution sources and working procedures required in the event of non-compliance with the environmental criteria and complaints; and
- Requirements for presentation of environmental monitoring and audit data and appropriate reporting procedures.

1.3.5 This EM&A Manual is a dynamic document that should be reviewed regularly and updated as necessary during the construction and operation of the Project. The Contractor should regularly review the mitigation measures and project

implementation schedule in **Appendix 5.1** with respect to the design developments and construction methodology.

1.4 Project Organization

1.4.1 A project organisation consisting of the Engineer's Representative (ER), Independent Environmental Checker (IEC), Environmental Team (ET), and Contractor should be established to take on the responsibilities for environmental protection for the Project.

1.4.2 The proposed project organization and lines of communication with respect to environmental protection works are shown in **Appendix 1.2**.

1.4.3 The responsibilities of respective parties are:

Engineer or Engineer's Representative (ER)

1.4.4 The Engineer is responsible for overseeing the construction works and for ensuring that the works are undertaken by the Contractor in accordance with the specification and contractual requirements. The duties and responsibilities of the Engineer with respect to EM&A include:

- Supervise the Contractor's activities and ensure that the requirements in the updated EM&A Manual are fully complied with;
- Inform the Contractor when action is required to reduce impacts in accordance with the Event and Action Plans;
- Participate in joint site inspections and audits undertaken by the ET; and
- Adhere to the procedures for carrying out exceedance and complaint investigations.

The Contractor

1.4.5 The Contractor should report to the ER. The duties and responsibilities of the Contractor are:

- Implement the updated EM&A Manual recommendations and requirements;
- Provide assistance to ET in carrying out monitoring and auditing;
- Submit proposals on mitigation measures in case of exceedances of Action and Limit Levels in accordance with the Event and Action Plans;
- Implement measures to reduce impact where Action and Limit Levels are exceeded; and
- Adhere to the agreed procedures for carrying out compliant investigation.

Environmental Team (ET)

1.4.6 The leader of the Environmental Team (ET) shall be an independent party from the Contractor and has relevant professional qualifications, or have sufficient relevant EM&A experience.

1.4.7 The ET should conduct the EM&A programme and ensure the Contractor's compliance with the Project's environmental performance requirements during construction. The ET should be an independent party from the Contractor.

1.4.8 The ET should be led and managed by the ET leader. The ET leader should possess at least 7 years of experience in EM&A. The ET should monitor the mitigation measures implemented by the Contractor on a regular basis to ensure the compliance with the intended aims of the measures. The duties and responsibilities of the ET are:

- Set up all the required environmental monitoring stations in this Manual;
- Monitor various environmental parameters as required in this Manual;
- Analyse the EM&A data and review the success of EM&A programme to cost-effectively confirm the adequacy of mitigation measures implemented and to identify any adverse environmental impacts arising;
- Carry out site inspection to investigate and audit the Contractors' site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and take proactive actions to pre-empt problems;
- Audit and prepare reports on the environmental monitoring data and site environmental conditions;
- Recommend suitable mitigation measures to the Contractor in the case of exceedance of Action and Limit Levels in accordance with the Event and Action Plans;
- Undertake regular and ad-hoc on-site audits / inspections and report to the Contractor and the ER of any potential non-compliance;
- Follow up and close out non-compliance actions;
- Advise the Contractor on environmental improvement, awareness, enhancement matters, etc. on site;
- Timely submission of the EM&A report(s) to the Project Proponent and the EPD; and
- Adhere to the procedures for carrying out environmental complaint investigation in accordance with **Section 12** of this Manual.

Independent Environmental Checker (IEC)

1.4.9 The IEC should advise the ER on environmental issues related to the Project. The IEC should possess at least 7 years of experience in EM&A. The duties and responsibilities of the IEC are:

- Review the EM&A works performed by the ET (at not less than monthly intervals);
- Audit the monitoring activities and results (at not less than monthly intervals);
- Report the audit results to the ER;
- Review the EM&A reports submitted by the ET;
- Review the proposal on mitigation measures submitted by the Contractor in accordance with the Event and Action Plans;
- Check the mitigation measures submitted by the Contractor in accordance with the Event and Action Plans;
- Check the mitigation measures that have been recommended in this updated EM&A Manual, and ensure they are properly implemented in a timely manner, when necessary;
- Report the findings of site inspections and other environmental performance reviews to ER;
- Verify the investigation results of the environmental complaint cases and the effectiveness of corrective measures;
- Verify EM&A report that has been certified by the ET leader; and
- Provide feedback on the audit results to the ET, the ER or the EP holder according to Event and Action Plans.

1.4.10 Sufficient and suitably qualified professional and technical staff shall be employed by the respective parties to ensure full compliance with their duties and responsibilities, as required under the EM&A programme for the duration of the Project.

1.5 Structure of the EM&A Manual

1.5.1 Following this introductory section, the remainder of the Manual is set out as follows:

- Section 2 details auditing requirements for hydrology;
- Section 3 details auditing requirements for ecology;
- Section 4 details auditing requirements for fisheries;

- Section 5 sets out EM&A requirements for air quality;
- Section 6 sets out EM&A requirements for noise;
- Section 7 details auditing requirements for water quality;
- Section 8 details auditing requirements for waste management;
- Section 9 details auditing requirements for land contamination;
- Section 10 details auditing requirements for cultural heritage;
- Section 11 details auditing requirements for landscape and visual;
- Section 12 describes the scope and frequency of the environmental site audits and sets out the general requirements of the EM&A programme; and
- Section 13 details the EM&A reporting requirements.

2 Hydrology

2.1 Introduction

2.1.1 The ERR concluded that there would be no adverse impacts on hydrology during both construction and operational phases.

2.2 Mitigation Measures

2.2.1 Considering there would be no adverse impacts on hydrology due to the Project, mitigation measures are therefore not required during both construction and operational phases.

2.3 Environmental Monitoring and Site Audit Requirement

2.3.1 Hydrology monitoring and audit is not required for both construction and operational phases.

3 Ecology

3.1 Introduction

3.1.1 The ERR has evaluated the ecological impacts associated with the construction and operation of the Project. The impact is considered minor and thus no significant ecological impact is anticipated for both construction and operational phases.

3.2 Mitigation Measures

3.2.1 Since both direct and indirect ecological impacts in construction phase are considered insignificant, no mitigation measures are required.

3.2.2 During the operational phase, no insurmountable residual ecological impact was identified for the proposed development in and around the Project Site, and hence no mitigation measures would be required.

3.3 Environmental Monitoring and Site Audit Requirements

3.3.1 Since both direct and indirect ecological impacts during construction and operational phases were considered as low and insignificant respectively, no environmental monitoring and audit are required.

4 Fisheries

4.1 Introduction

4.1.1 The ERR concluded that there would be no adverse impacts on fisheries during both construction and operational phases.

4.2 Mitigation Measures

4.2.1 No specific fisheries mitigation measure is required during both construction and operational phases.

4.3 Environmental Monitoring and Site Audit Requirement

4.3.1 No specific fisheries monitoring and audit is required for both construction and operational phases.

5 Air Quality Impact

5.1 Introduction

5.1.1 The ERR has considered the potential air quality impacts during construction phase of the Project. Based on the assessment results, adverse construction dust impact is not anticipated with the implementation of mitigation measures. Construction dust monitoring and regular site environmental audit are recommended to check the implementation of mitigation measures and good site practices.

5.1.2 The ERR has also concluded that there will be no adverse air quality impacts during operational phase and hence, mitigation measures, environmental monitoring and site inspections during operational phase are not required.

5.2 Mitigation Measures

5.2.1 In order to reduce the construction dust emission from the Project, regular watering and other good site practices should be implemented. In addition, mitigation measures to control the exhaust emissions from construction plant and equipment are also required. All the recommended good practices are summarised in the Environmental Mitigation Implementation Schedule (EMIS) in **Appendix 5.1**.

5.3 Air Quality Monitoring Parameters

5.3.1 The 1-hour Total Suspended Particulate (TSP) levels shall be measured by following the standard high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50). Upon approval of the IEC, 1-hour TSP levels can be measured by direct reading method with using handheld dust particle measuring device which is capable of producing comparable results as that by the high volume sampling method, to indicate short event impacts.

5.4 Monitoring Equipment

5.4.1 The following specifications shall be complied should high volume samplers (HVSs) be used for carrying out the 1-hour TSP monitoring:

- 0.6 – 1.7 m^3 per minute adjustable flow range;
- Equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operations;
- Installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation;
- Capable of providing a minimum exposed are of 406cm^2 ;

- Flow control accuracy: +/-2.5% deviation over 24-hour sampling period; Separate equipped with a shelter to protect the filer and sampler;
- Incorporated with an electronic mass flow rate controller or other equivalent devices; Separate 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;
- Easily changeable filter; and
- Capable of operating continuously for a 24-hour period.

5.4.2 The ET is responsible for the provision, installation, operation, maintenance, dismantle of the monitoring equipment. They shall ensure that sufficient number of HVSs with an appropriate calibration kit is available for carrying out the baseline monitoring, 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.

5.4.3 Initial calibration of HVSs with mass flow controller should be conducted upon installation and thereafter every six months. The transfer standard shall be traceable to the internationally recognized primary standard and be calibrated annually. The calibration data should be properly documented for future reference by the IEC.

5.4.4 The flow-rate of the sampler before and after the sampling exercise with the filter in position shall be verified to be constant and be recorded in the data sheet as shown in **Appendix 5.2**.

5.4.5 If the ET Leader proposes to use a direct reading dust meter to measure 1-hr TSP levels, they shall submit sufficient information to the IEC to prove that the instrument is capable of achieving a comparable results to the HVS. The instrument shall also be calibrated regularly following the requirements specified by the equipment manufacturers, and the 1-hr sampling shall be determined periodically by HVS to check the validity and accuracy of the results measured by direct reading method.

5.4.6 Wind data monitoring equipment shall also be provided and set up for logging wind speed and wind direction near the dust monitoring locations. The equipment installation location shall be proposed by the ET and agreed with the IEC. For installation and shall be proposed by the ET and agreed with the IEC. For installation and operation of wind data monitoring equipment, the following points shall be observed:

- The wind sensors should be installed 10m above ground so that they are clear of obstructions or turbulence caused by buildings;

- The wind data should be captured by a data logger, the data shall be downloaded for analysis at least once a month;
- The wind data monitoring equipment should be re-calibrated at least once every six months; and
- Wind direction should be divided into 16 sectors of 22.5 degrees each.

5.4.7 In exceptional situations, the ET Leader may propose alternative methods to obtain representative wind data upon approval from the ER and agreement from the IEC.

Laboratory Measurement / Analysis

5.4.8 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 available for sample analysis, and equipment calibration and maintenance. The laboratory shall be Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited or other internationally accredited laboratory.

5.4.9 If a site laboratory is set up or a non-HOKLAS accredited laboratory is hired for carrying out the laboratory analysis, the laboratory equipment shall be verified by IEC. Measurement performed by the laboratory shall be demonstrated to the satisfaction of the ER and the IEC and EPD.

5.4.10 IEC shall conduct regular audit to the measurement performed by the laboratory to ensure the accuracy of measurement results. The ET Leader shall provide the ER with one copy of the Title 40 of Code of Federal Regulations, Chapter 1 (Part 50), Appendix B for his reference.

5.4.11 Filter paper of size 8" X 10" shall be labelled before sampling. It shall be a clean filter paper with no pinholes, and shall be conditioned in a humidity-controlled chamber for over 24-hours and be pre-weighed before use for the sampling.

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

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

5.5 Monitoring Locations

5.5.1 Based on the findings of the ERR, the designated locations for construction dust monitoring station are listed in **Table 5.1** and are shown in **Figure 5.1**.

5.5.2 The property owner of the proposed construction dust monitoring location Village Houses near Tung Fong (CD1) and Village Houses along Ho Sheung Heung Road

(CD3) rejected the installation of the monitoring station, therefore, these locations are considered not feasible to setup the construction dust monitoring station.

5.5.3 For the location Sheung Shui Pui Yau Kindergarten (CD2), the operator advised the education facility will be terminated the operation in September 2022, therefore, the construction dust monitoring at this location is considered not representative.

5.5.4 For the location Planned Private Housing (CD4) and Multi Welfare Service Complex (CD5) are still under construction and yet to be operated, the construction dust monitoring station could not be setup for baseline construction dust monitoring.

5.5.5 Considering it is not feasible to setup the construction dust monitoring station at the monitoring location proposed in the ERR due to the aforesaid various reasons, therefore, alternative construction dust monitoring locations are identified in the vicinity area of each original proposed monitoring locations.

5.5.6 An alternative construction dust monitoring location are identified at the approximately ranged from 65m to 215m from the respective original locations. The details of alternative construction dust monitoring location are listed in **Table 5.2**. The location and photos are shown in **Figure 5.1** and **Appendix 5.3** respectively. All alternative monitoring locations are close to the major construction activities and is considered the ambit environment would be similar to the original locations. Therefore, alternative construction dust monitoring station is considered a representative location to undertake baseline and impact construction dust monitoring.

5.5.7 The baseline construction dust monitoring station is listed in **Table 5.2** and is shown in **Figure 5.1**.

Table 5.1 Proposed construction dust monitoring station in the ERR

Monitoring Station ID	Air Sensitive Receiver (ASR) ID in the ERR	Description	Remark
CD1	A5	Village Houses near Tung Fong	• Existing ASR in residential use. • The property owner rejected to set up the construction dust monitoring station.
CD2	A11	Sheung Shui Pui Yau Kindergarten	• Existing ASR of educational institution. • To be terminated the operation in September 2022.
CD3	A12	Village Houses along Ho Sheung Heung Road	• Existing ASR in residential use. • The property owner rejected to set up the construction dust monitoring station.
CD4	PA1	Planned Private Housing	• Planned ASR in residential use. • Under construction in the

Monitoring Station ID	Air Sensitive Receiver (ASR) ID in the ERR	Description	Remark
			preparation of this manual.
CD5	PA2	Planned Multi Welfare Service Complex	• Planned ASR. in G/IC use (Government, Institution & Community). • Under construction in the preparation of this manual.

Table 5.2 Alternative construction dust monitoring station

Monitoring Station ID	Air Sensitive Receiver (ASR) ID in the ERR	Description	Remark
CD1a	A3	Village Houses along Ma Tso Lung Road	• Existing ASR in residential use. • It is approximately 215m from the original monitoring station CD1. • Same residential use and similar ambient environment with the original monitoring station CD1. • Same monitoring location during impact monitoring.
CD2a	A10	Village Houses near Shek Tsai Leng	• There is no other educational institution adjacent to the original location. • Existing ASR in residential use is considered a representative location to replace the original educational institution. • It is approximately 65m from the original monitoring station CD2. • Same monitoring location during impact monitoring.
CD3a	N/A	Village Houses along Ho Sheung Heung Road	• Existing ASR in residential use. • Location between ASRs ID A1 and A2, and approximately 120m from the monitoring station CD3. • Same residential use and similar ambient environment with the original monitoring station CD3. • Same monitoring location during impact monitoring.

Monitoring Station ID	Air Sensitive Receiver (ASR) ID in the ERR	Description	Remark
CD4a	N/A	Construction site office of Advance Site Formation and Engineering Infrastructure Works at Kwu Tung North and Fanling North New Development Areas – Contract No. ND/2019/06	• No existing ASR residential use is identified in the southern area of the project site. • Existing ASR in site office use is considered a representative location to replace the original planned ASR. • Located approximately 210m from the original monitoring station CD4. • Impact monitoring will be conducted at CD4 according to the corresponding commencement date.
CD5a	A15	Dills Corner Garden	• Existing ASR in G/IC use. • Located approximately 150m from the original monitoring station CD5. • Same G/IC use and similar ambient environment with the original monitoring station CD5. • Impact monitoring will be conducted at CD5 according to the corresponding commencement date.

5.5.8 The status and locations of the air quality sensitive receivers may change after issuing this Updated EM&A Manual. In such case, the ET shall propose updated monitoring locations and seek agreement from IEC and EPD.

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

- Monitoring at ASRs close to the major site activities which are likely to have air quality impacts;
- Monitoring as close as possible to the ASRs as defined in the EIAO-TM;
- Assurance of minimal disturbance to the occupants and working under a safe condition during monitoring ; and
- Take into account the prevailing meteorological conditions.

5.5.10 The ET shall agree with the ER in consultation with the IEC on the position of the HVS for the installation of the monitoring equipment. When positioning the HVS, the following points shall be noted:

- A horizontal platform with appropriate support to secure the samplers against gusty wind should be provided;

- No two samplers should be placed less than 2 meters apart;
- The distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler;
- A minimum of 2 meters of separation from walls, parapets and penthouses is required for rooftop samplers;
- A minimum of 2 meters separation from any supporting structure, measured horizontally is required;
- No furnace or incinerator flue is nearby;
- Airflow around the sampler is unrestricted;
- The sampler is more than 20 meters from the dripline;
- Any wire fence and gate, to protect the sampler, should 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.

5.6 Baseline Monitoring

5.6.1 TSP baseline monitoring should be carried out for a continuous period of at least two weeks with three sets of 1-hour ambient measurements taken daily at each monitoring station listed in **Table 5.2** prior to the commissioning of major construction works.

5.6.2 Before commencing baseline monitoring, the ET shall inform the IEC on the baseline monitoring programme such that the IEC can conduct on-site audit to ensure accuracy of the baseline monitoring results.

5.6.3 During the baseline monitoring, there should not be any dust generation activities in the vicinity of the monitoring stations. General meteorological conditions (wind speed, direction and precipitation) and notes regarding any significant adjacent dust producing sources should also be recorded throughout the baseline monitoring period. A summary of baseline monitoring programme is presented in **Table 5.3**.

5.6.4 In case the baseline monitoring cannot be carried out at the designated monitoring locations, the ET shall carry out the monitoring at alternative locations that can effectively represent the baseline conditions at the impact monitoring location. The alternative baseline monitoring locations shall be agreed with the IEC prior to commencement of baseline monitoring.

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

approval. If the ET Leader considers that significant changes in the ambient conditions have arisen, a repeat of the baseline monitoring may be carried out to update the baseline levels and air quality criteria, after consultation and agreement with the ER, the IEC and the EPD.

5.7 Impact Monitoring

5.7.1 The ET shall carry out impact monitoring at all designated monitoring locations for construction dust during construction period. For 1-hour TSP monitoring, the sampling frequency of 3 times in every 6 days should be undertaken when the highest dust impact occurs. The impact monitoring programme is summarized in **Table 5.3**.

5.7.2 The monthly schedule of the impact monitoring programme should be prepared by the ET one month prior to the commencement of the scheduled construction period. Before commencement of the impact monitoring, the ET should inform the IEC on the impact monitoring programme such that the IEC can conduct an on-site audit.

Table 5.3 Summary of construction dust monitoring programme

Monitoring Period	Duration	Sampling Parameter	Frequency
Baseline Monitoring	Consecutive days of at least 2 weeks before commencement of major construction works	1-hour TSP	3 times per day
Impact Monitoring	Throughout the construction phase [1]	1-hour TSP	3 times in every 6 days

Note:
[1]: Impact monitoring should be conducted at the monitoring stations for 1-hour TSP monitoring when there are Project-related major construction activities being undertaken within a radius of 500m from the monitoring stations.

5.8 Action and Limit Levels

5.8.1 The baseline monitoring results form the basis for determining the air quality criteria for the impact monitoring during the construction phase. The ET shall compare the impact monitoring results with air quality criteria set up for 1-hour TSP. **Table 5.4** shows the air quality criteria, namely Action and Limit Levels to be used.

Table 5.4 Action Level and Limit Level for air quality

Parameter	Action Level	Limit Level
1-hour TSP Level in $\mu g/m^3$	For baseline level ≤ 384 $\mu g/m^3$, Action level = (baseline level * 1.3 + Limit level)/2; For baseline level > 384 $\mu g/m^3$, Action level = Limit level	500$\mu g/m^3$

5.8.2 The Event and Action Plan prescribes procedures and actions associated with the outcome of the comparison of air quality monitoring data recorded and the agreed

Action and Limit levels. In the cases where exceedances of these Action and Limit levels occur, the ET, the IEC, the ER and the Contractor should strictly observe the relevant actions of the respective Event and Action Plan listed in **Table 5.5**.

5.9 Event and Action Plan

5.9.1 Should non-compliance of the air quality criteria occur, actions in accordance with the Event and Action Plan in **Table 5.5** shall be carried out.

Table 5.5 Event and Action Plan for Construction Dust

Event	Action			
	ET	**IEC**	**ER**	**Contractor**
Action level exceedance for one sample	1. Repeat measurement to confirm finding; 2. If exceedance is confirmed, inform Contractor, IEC and ER; 3. Identify source, investigate the causes of exceedance and propose remedial measures; 4. Discuss with the Contractor, IEC and ER on the remedial measures required; 5. Increase monitoring frequency.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET, ER and Contractor on possible remedial measures; 4. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance in writing.	1. Identify source(s), investigate the causes of exceedance and propose remedial measures; 2. Implement remedial measures; 3. Amend working methods agreed with the ER as appropriate.
Action level exceedance for two or more consecutive samples	1. Repeat measurement to confirm finding; 2. If exceedance is confirmed, inform Contractor, IEC and ER; 3. Identify source, investigate the causes of exceedance and propose remedial measures; 4. Advise the Contractor and ER on the effectiveness of the proposed remedial measures; 5. Increase monitoring frequency; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER to discuss the remedial measures to be taken; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET, ER and Contractor on possible remedial measures; 4. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the ET and IEC agree with the Contractor on the remedial measures to be implemented; 3. Supervise implementation of remedial measures.	1. Identify source(s), investigate the causes of exceedance and propose remedial measures; 2. Submit proposals for remedial measures to the ER, ET and IEC within three working days of notification for agreement; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit level exceedance for one sample	1. Repeat measurement to confirm finding; 2. If exceedance is confirmed, inform IEC, ER, Contractor and EPD; 3. Increase monitoring frequency to daily; 4. Discuss with the ER, IEC and Contractor on the remedial measures and assess effectiveness; 5. Keep ER, IEC and EPD informed of the results of the effectiveness of remedial measures.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET, ER and Contractor on possible remedial measures; 4. Review and advise the ET and ER on the effectiveness of the	1. Confirm receipt of notification of exceedance in writing; 2. Review and agree on the remedial measures proposed by the Contractor; 3. Ensure remedial measures properly implemented;	1. Identify source(s), investigate the causes of exceedance and propose remedial measures 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial actions to ER, ET and IEC within three

Event	Action			
	ET	IEC	ER	Contractor
		proposed remedial measures.	4. Supervise implementation of remedial measures.	working days of notification for agreement; 4. Implement the agreed proposals; 5. Amend proposal if appropriate.
Limit level exceedance for two or more consecutive samples	1. Repeat measurement to confirm finding; 2. If exceedance is confirmed, inform IEC, ER, Contractor and EPD; 3. Increase monitoring frequency to daily; 4. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 5. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 6. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET 2. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 3. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Supervise the implementation of remedial measures; 4. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Identify source(s), investigate the causes of exceedance and propose remedial measures 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial actions to ER, IEC and ET within three working days of notification for agreement; 4. Implement the agreed proposals; 5. Review and resubmit proposals if problem still not under control; 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

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

6 Noise Impact

6.1 Introduction

6.1.1 The ERR has considered the potential noise impacts associated with the construction and operation of the Project. Given relatively small scale of works and with proper implementation of recommended mitigation measures, the construction noise impact is anticipated to be insignificant.

6.1.2 During the operational phase, no adverse railway noise impact is expected. For fixed noise sources impact, with proper implementation of the recommended good practices and noise mitigation measures, the planned fixed noise sources impact is anticipated to be insignificant. Commissioning tests of fixed noise sources shall be conducted prior to the operation of the Project to confirm that the relevant standards stipulated in EIAO-TM and Noise Control Ordinance (NCO) would be complied with.

6.1.3 The EM&A requirements, methodology, equipment, monitoring locations, criteria and protocols for the air-borne noise impacts during the construction and operation phases of the project are presented in this section.

6.2 Mitigation Measures

Construction Phase

6.2.1 During the construction phase, adverse construction noise impact is not anticipated with the implementation of mitigation measures such as good site practices, use of quality powered mechanical equipment (QPME) and use of temporary noise barriers and noise enclosures to screen noise from relatively static PMEs etc. All the recommended mitigation measures and good site practices are summarised in the EMIS given in **Appendix 5.1**.

6.2.2 In the event of exceedances or complaints, the Contractor should review the effectiveness of these mitigation measures and propose, design and implement alternative or additional measures as appropriate. The Contractor should liaise with the ET on the alternative or additional mitigation measures, provide them to the ER for approval, and implement the mitigation measures.

Operational Phase

6.2.3 Since the operation of LMC Spur Line will remain unchanged during the operational phase of the Project, the operational railway noise impact assessed by the approved EIA Report are still valid. No additional mitigation measure is required.

6.2.4 For fixed noise sources impact, the typical fixed noise sources for railway station are identified. With proper implementation of the recommended good practices and noise mitigation measures, such as properly selection of the equipment and installation of acoustic attenuators, the planned fixed noise sources impact is anticipated to be insignificant. All recommended noise mitigation measures during operational phase are summarised in the EMIS given in **Appendix 5.1**.

6.3 Noise Monitoring Parameters

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

6.3.2 Supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference. A sample data record sheet is shown in **Appendix 6.1** for reference.

6.4 Monitoring Equipment for Construction and Operational Phases

6.4.1 As referred to 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 agrees to within 1.0 dB.

6.4.2 Noise measurements should be made in accordance with standard acoustical principles and practices in relation to weather conditions.

6.4.3 The ET is responsible for the provision, installation, operation, maintenance, dismantle of the monitoring equipment and shall ensure that sufficient noise measurement 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.

6.5 Noise Monitoring Stations

6.5.1 Based on the findings of the ERR, the designated location for construction noise monitoring are listed in **Table 6.1** and are shown in **Figure 6.1**.

6.5.2 As the proposed noise monitoring location Multi Welfare Service Complex (CN1) is still under construction and yet to be operated, the noise monitoring station could not be set up for noise monitoring.

6.5.3 An alternative noise monitoring location is identified at the approximately 80m from the original location as shown in **Figure 6.1** which is also close to the major construction activities. It is considered the ambit environment would be similar to the original location. Therefore, alternative noise monitoring station is proposed at CN1a, which is considered to be representative of the noise monitoring station (CN1).

6.5.4 The noise monitoring location is listed in **Table 6.2** and is shown in **Figure 6.1**.

Table 6.1 Proposed construction noise monitoring station in the ERR

Monitoring Station ID	NSR ID in the ERR	Description	Remark
CN1	PA2	Multi Welfare Service Complex	• Planned NSR in G/IC use (Government, Institution & Community). • Under construction in the preparation of this manual.

Table 6.2 Alternative construction noise monitoring station

Monitoring Station ID	NSR ID in the ERR	Description	Remark
CN1a	A15	Dills Corner Garden	• Existing NSR in G/IC use. • Located approximately 150m from the monitoring station CN1. • Similar ambient environment with the monitoring station CN1. • Impact monitoring will be conducted at CN1 according to the corresponding commencement date.

6.5.5 The status and locations of the NSRs may change after approval of this EM&A Manual. In such case, the ET shall propose updated monitoring locations and seek approval from the ER and agreement from the IEC and EPD on the proposal. If alternative monitoring stations are proposed, these stations should be chosen based on the following criteria:

- Monitoring at NSRs close to the major site activities of the Project that are likely to arise noise impacts;
- Monitoring as close as possible to the NSRs as defined in the EIAO-TM; and
- Assurance of minimal disturbance to the occupants and working under a safe condition during monitoring.

6.5.6 The monitoring station shall normally be at a point 1m from the exterior of the sensitive receiver building facade and be at a position 1.2m above the ground. If there is problem with access to the normal monitoring position, an alternative position may be chosen, and a correction to the measurements shall be made. For reference, a correction of +3 dB(A) shall be made to the free field measurements.

6.5.7 The ET shall agree with the IEC on the monitoring position and the corrections adopted. Once the positions for the monitoring stations are chosen, the baseline monitoring and the impact monitoring shall be carried out at the same positions.

6.6 Baseline Monitoring

6.6.1 In accordance with Section 2.4 of Appendix D2 of Guidelines for Development Projects in Hong Kong published by EPD, baseline noise monitoring before commencement of construction works is not normally required.

6.7 Impact Monitoring

6.7.1 Noise monitoring should be carried out at all the designated monitoring stations when there are Project-related construction activities being undertaken within a radius of 300m from the monitoring stations. The monitoring should obtain one set of 30-minute measurement at each station between 0700 and 1900 hours on normal weekdays at a frequency of once a week when construction activities within 300m from respective monitoring station are underway.

6.7.2 In case of non-compliance with the construction noise criteria, more frequent monitoring, as specified in the Event and Action Plan in **Table 6.4**, 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.

6.8 Action and Limit Levels

6.8.1 The Action and Limit levels for construction noise are defined in **Table 6.3**. Should non-compliance of the noise quality criteria occur actions in accordance with the Event and Action Plan in **Table 6.4** shall be taken.

Table 6.3 Action and Limit Levels for construction noise

Time Period	Action Level	Limit Level
0700 - 1900 hours on normal weekdays	When one documented complaint is received	75 dB(A) for residential premises
		70 dB(A) for schools and 65 dB(A) during school examination periods.

Notes:
If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.

6.9 Event and Action Plan

6.9.1 Should non-compliance of the noise criteria occur, actions in accordance with the Event and Action Plan in **Table 6.4** shall be carried out.

Table 6.4 Event and Action Plan for Construction Noise

Event	Action			
	ET	**IEC**	**ER**	**Contractor**
Action Level Exceedance	1. Notify IEC, ER and Contractor; 2. Identify source and carry out investigation; 3. Discuss with the Contractor and formulate remedial measures; 4. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented	1. Identify source, and carry out investigation and report the investigation to the ET, IEC and ER; 2. Submit noise mitigation proposals to IEC and ER; 3. Implement noise mitigation proposals.
Limit Level Exceedance	1. Repeat measurements to confirm exceedance; 2. If exceedance is confirmed, notify the Contactor, IEC, EPD and ER; 3. Increase monitoring frequency; 4. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 5. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 6. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 7. If exceedance stops, cease additional monitoring.	1. Check monitoring results and discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Ensure remedial measures properly implemented; and 3. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Identify source and carry out investigation and report the investigation to the ET, IEC and ER; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial actions to ER, ET and IEC within 3 working days of notification; 4. Implement the agreed proposals; 5. Resubmit proposals if problem still not under control; 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

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

6.10 Operational Phase – Fixed Plant Noise

6.10.1 It is anticipated that the Project would provide ventilation fans, smoke extraction fans, chillers etc. at the ventilation building. The maximum allowable sound power level (SWL) of the identified fixed noise sources has established in the EER. The Contractor should implement and refine the specified sound power levels as appropriate to ensure compliances with the noise standards stipulated in the EIAO-TM and NCO for the fixed plant operation.

6.10.2 The Contractor should also carry out a noise commissioning test for fixed noise sources before the operation of the Project, in order to ensure compliance of the noise levels with the stipulated noise standards in the EIAO-TM and NCO.

6.10.3 The noise commissioning tests for planned fixed noise sources shall be conducted by independent qualified person(s) possessing at least 7 years of noise control experience and a corporate membership of Hong Kong Institute of Acoustics or equivalent. The noise commissioning test report shall be submitted to ER, ET and IEC for agreement.

6.11 Operational Phase – Railway Noise

6.11.1 No adverse railway noise impact is expected during the operation of the Project, and therefore railway noise monitoring is not required.

7 Water Quality Impact

7.1 Introduction

7.1.1 The ERR has assessed the potential water quality impacts associated with the construction and operation of the Project. According to the ERR, adverse environmental impact is not anticipated during the construction and operational phases with proper implementation of the recommended mitigation measures and good site practices.

7.2 Mitigation Measures

7.2.1 During the construction phase, the recommended mitigation measures such as good site practices for controlling construction site runoff, implementation of settlement discharge tanks prior to discharge, licensed waste collector for sewage effluent, good management procedure to handle accidental spillage etc., should be implemented. All the recommended mitigation measures are summarised in the EMIS in **Appendix 5.1.**

7.2.2 With proper connection to the public drainage and sewage systems and mitigation measure in place such as stormwater surface runoff, sewage from sanitary fitment and foul water from washing facilities discharged to the nearby government drainage system with provision of Standard oil/grit interceptors/chambers and the practices outlined in ProPECC PN 5/93, application of a discharge licence for the discharge of commercial and industrial effluent, adverse impact is not anticipated during the operational phase. All the recommended mitigation measures are summarised in the EMIS in **Appendix 5.1.**

7.3 Environmental Monitoring and Site Audit Requirements

Construction Phase

7.3.1 Apart from the water quality measurement specified in the discharge licence under the WPCO, no additional water quality monitoring is considered necessary. The necessary water quality measurements under the WPCO shall be conducted at the discharge location(s) specified in the licence conditions.

7.3.2 Weekly environmental site inspection shall be carried out by the ET during the construction phase to ensure that the recommended good site practices and other mitigation measures are implemented by the Contractor. Apart from the environmental site inspections, documents including discharge licenses shall be reviewed and audited for the compliance with the legislation and contract requirements.

7.3.3 The requirements of the environmental audit programme are set out in **Section 12** of this Manual. The audit programme will verify the implementation status and evaluate the effectiveness of the mitigation measures.

Operational Phase

7.3.4 With proper connection to the public drainage and sewerage systems, no adverse impact on the watercourse in proximity to the Project is anticipated during the operational phase. Hence, water quality monitoring is not required. Nevertheless, the conditions specified in the discharge licence for the discharge of commercial and industrial effluent shall be followed.

8 Waste Management Implications

8.1 Introduction

8.1.1 The quantity and timing for the generation of waste during construction phase have been estimated in the ERR. Measures including the opportunity for on-site sorting, reusing Construction and Demolition (C&D) materials etc., are devised in the construction methodology to minimise the surplus materials to be disposed. Chemical waste should be collected by licensed chemical waste collectors for proper disposal.

8.1.2 During the operational phase, the major types of waste to be generated are municipal solid waste from the public, station employees and commercial operators within the stations and chemical waste from the maintenance of the stations, tracks and EAP/EEP.

8.2 Mitigation Measures

Construction Phase

8.2.1 Waste will be handled in accordance with the relevant legislation and guidelines and with the implementation of the proposed mitigation measures, no adverse environmental impacts from waste management are anticipated. EM&A is required for waste management during the construction phase only and the effective management of waste arising during the construction phase will be monitored through the site audit programme. The aims of the waste audit are:

- To ensure the waste arising from the works are handled, stored, collected, transferred and disposed of in an environmental acceptable manner; and
- To encourage the reuse and recycling of material.

8.2.2 All the proposed mitigation measures during construction phase are summarised in **Appendix 5.1**.

Operational Phase

8.2.3 As there would be limited quantities of waste to be generated from the operation of the Project, no adverse environmental impacts would be anticipated with the implementation of good waste management practices. All the proposed mitigation measures during operational phase are summarised in the EMIS in **Appendix 5.1.**

8.3 Environmental Monitoring and Site Audit Requirements

Construction Phase

8.3.1 The Contractor shall be required to pay attention to the environmental standard and guidelines and carry out appropriate waste management and obtain the relevant licenses/ permits for waste disposal. The ET shall ensure that the Contractor has obtained from the appropriate authorities the necessary waste disposal permits or licenses including:

- Chemical Waste Disposal License under the Waste Disposal Ordinance (Cap 354);
- Dumping at Sea Ordinance (DASO) (Cap. 466) if marine disposal of land-based sediment is unavoidable;
- Dumping License under the Land (Miscellaneous Provisions) Ordinance (Cap 28); and
- Water Pollution Control Ordinance License under the Water Pollution Control Ordinance

8.3.2 The Contractor shall refer to EPD's Guidance Notes for License Application when applying for the license/ permit and the ET shall refer to these Guidance Notes for auditing purposes.

8.3.3 Regular audits and site inspections should be carried out during the construction phase by the ET to ensure that the recommended good site practices and other mitigation measures recommended in the ERR and in **Appendix 5.1** are properly implemented by the Contractor. The audits should concern all aspects of on-site waste management practices including waste generation, storage, recycling, transport and disposal. Apart from site inspection, a Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) shall be prepared. Documents including licenses, permits, disposal and recycling records should be reviewed and audited for compliance with the legislation and contract requirements.

8.3.4 The requirements of the environmental audit programme are set out in **Section 12** of this Manual. The audit programme will verify the implementation status and evaluate the effectiveness of the mitigation measures.

Operational Phase

8.3.5 It is anticipated that there would not be any insurmountable impacts during the operational phase, monitoring and audit requirements are not required.

9 Land Contamination

9.1 Introduction

9.1.1 Land contamination assessment has been conducted in the ERR. Site re-appraisal including review the historical landuse and site survey of the Project Site has been conducted in order to update the latest information for the current landuse of the Project Site.

9.2 Mitigation Measures

9.2.1 No potentially land contamination activities was identified at most of the works sites and works area during the site re-appraisal, no further mitigation measure and action is required at these areas. However, 1 potentially contaminated site as identified in the approved EIA for NENT NDA is partially located within the western works sites which is located within the Advance Stage Development of KTN NDA and CEDD confirmed to review the land contamination status and implement any land contamination remediation works required before the concerned lands are handed over to the Project Proponent. Additional mitigation measures are not required.

9.3 Environmental Monitoring and Site Audit Requirements

9.3.1 It is anticipated that there would be no adverse impacts on land contamination during construction and operational phases, and thus monitoring and audit are considered not required.

10 Culture Heritage

10.1 Introduction

10.1.1 Culture heritage assessment has been conducted in the ERR. None of the spot of archaeological interest, built heritage or spot of archaeological interest is located within the Project Site.

10.2 Mitigation Measures

10.2.1 No spot with archaeological interest, declared monument or graded building identified in the approved EIA for NENT NDA is located within the Project Site. Besides, landscape features identified in the approved EIA for NENT NDA are not located within the Project Site. Due to the small scale of the Project and the large separation between the Project Site and the cultural heritages, adverse impact on the cultural heritages is not anticipated and no mitigation will be required.

10.2.2 However, as the Project Site is partially fall within the area of low archaeological potential as identified in the approved EIA for NENT NDA, the recommended mitigation measure in the approved EIA for NENT NDA should be implemented during the excavation works in construction phase as follow:

- Pursuant to the Antiquities and Monuments Ordinance (Cap. 53) the construction contractor should inform the AMO immediately in case of discovery of antiquities or supposed antiquities in the course of soil excavation works in construction stage.

10.2.3 In addition, if there are any buildings / structures both at grade level and underground which were built on or before 1969 within the works sites/ works areas during the construction, the ET and Project Proponent will alert AMO in an early stage or once identified.

10.3 Environmental Monitoring and Site Audit Requirements

10.3.1 It is anticipated that there would be no adverse impacts on cultural heritage during construction and operational phases, and thus monitoring and audit are considered not required.

11 Landscape and Visual

11.1 Introduction

11.1.1 The ERR has recommended that EM&A for landscape and visual resources is undertaken during the design, construction and operational phases of the project. The design, implementation and maintenance of landscape mitigation measures should be checked to ensure that any potential conflicts between the proposed landscape measures and any other works of the Project would be resolved at early as practical without affecting the implementation of the mitigation measures.

11.2 Mitigation Measures

11.2.1 The landscape and visual impact assessment of the ERR proposes a number of mitigation measures to ameliorate the landscape and visual impacts of the Project. These measures are listed in **Table 11.1** below and summarised in the EMIS in **Appendix 5.1**.

Table 11.1 Mitigation measures for the construction and operational phases

Summary Description	Mitigate Landscape Impacts	Mitigate Visual Impacts
Construction Phase		
Decorative Site Hoarding	-	Y
Operational Phase		
Tree Compensation	Y	Y
Screen Planting / Vertical Greening	Y	Y
Architectural Aesthetic Design of Built Structure	-	Y

11.2.2 Mitigation measures to be implemented during construction should be adopted from the start of construction and be in place throughout the entire construction period. Mitigation measures to be implemented during operation should be integrated into the detailed design and built as part of the construction works so that they are in place on commissioning of the Project as far as practical.

11.3 Environmental Monitoring and Audit Requirement

11.3.1 Site audit should be undertaken during the construction phase of the Project to check that the proposed landscape and visual mitigation measures are properly implemented and maintained as per their intended objectives. Site inspections should be undertaken by the ET at least once per month during the construction period.

11.3.2 With the mitigation measures recommended in the ERR implemented, specific auditing during the operational phase of the Project is not required.

12 Site Environmental Audit

12.1 Site Inspection

12.1.1 Site inspection is one of the most effective tools to enforce the environmental protection requirements at the works area by providing a direct mean to trigger and enforce specified environmental protection and pollution control measures. Site inspection should be undertaken regularly during the construction phase to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented for the activities associated with the Project.

12.1.2 The ET Leader shall be responsible for formulating the environmental site inspection programme as well as the deficiency and action reporting system, and for carrying out the site inspections. The proposal for rectification, if any, should be prepared and submitted to the ET Leader and IEC by the Contractor.

12.1.3 Regular site inspections shall be carried out and led by the ER and attended by the Contractor and ET at least once per week during the construction phase. The areas of inspection shall not be limited to the environmental situation, pollution control and mitigation measures within the site. It should also review the environmental conditions of locations outside the works area which is likely to be affected, directly or indirectly, by the construction site activities of the Project. The ET shall make reference to the following information in conducting the inspection. During the inspection, the following information should be referred to:

- ERR and EM&A recommendations on environmental protection and pollution control mitigation measures;
- Ongoing results of the EM&A programme;
- Works progress and programme;
- Individual works methodology proposals (which shall include the proposal on associated pollution control measures);
- Contract specifications on environmental protection;
- Relevant environmental protection and pollution control legislations; and
- Previous site inspection results.

12.1.4 The Contractor shall keep the ER and ET Leader updated with all the relevant environmental related information on the construction contract necessary for him to carry out the site inspections. Site inspection results and associated recommendations for improvements to the environmental protection and pollution control efforts should be recorded and followed up by the Contractor in an agreed time-frame. The Contractor shall follow the procedures and time-frame as stipulated in the environmental site inspection, and the deficiency and action

reporting system formulated by the ET, to report on any remedial measures subsequent to the site inspections.

12.1.5 The ER, ET and the Contractor should also carry out ad-hoc site inspections if significant environmental problems are identified. Inspections may also be required subsequent to receipt of a valid environmental complaint, or as part of the investigation work, as specified in the Event and Action Plans for the EM&A programme.

12.2 Environmental Compliance

12.2.1 There are statutory requirements on environmental protection and pollution control requirements with which construction activities must comply.

12.2.2 In order to ensure the works comply with statutory requirements, all method statements of works should be submitted by the Contractor to the ER for approval and to the ET Leader to ensure sufficient environmental protection and pollution control measures have been included.

12.2.3 The Environmental Mitigation Implementation Schedule (EMIS) is summarised in **Appendix 5.1**. Any proposed changes to the mitigation measures shall be certified by the ET Leader and verified by the IEC as conforming to the relevant information and recommendations contained in the ERR Report.

12.2.4 The ET shall also review the progress and programme of the works to check that relevant environmental legislation has not been violated, and that any foreseeable potential for violating laws can be prevented.

12.2.5 The Contractor should provide the update of the relevant documents to the ET Leader so that checking can be carried out. The document shall at least include the updated Works Progress Reports, updated Works Programme, method statements, any application letters for different licenses / permits under the environmental protection laws, and copies of all valid licenses / permits. The site diary and environmental records shall also be available for inspection by the relevant parties.

12.2.6 After reviewing the document, the ET shall advise the IEC and the Contractor of any non-compliance with legislative requirements on environmental protection and pollution control so that they can timely take follow-up actions as appropriate. If the follow-up actions still result in potential violation of environmental protection and pollution control requirements, the ER and ET should provide further advice to the Contractor to take remedial action to resolve the problem.

12.2.7 Upon receipt of the advice, the Contractor shall undertake immediate actions to correct the situation. The ER and ET shall follow up to ensure that appropriate action has been taken in order to satisfy legal requirements.

12.3 Environment Complaints

12.3.1 The following procedures should be undertaken upon receipt of any environmental complaint:

- The Contractor to log complaint and date of receipt onto the complaint database and inform the ER, ET and IEC immediately;
- The Contractor to investigate, with the ER and ET, the complaint to determine its validity, and assess whether the source of the problem is due to construction works of the Project with the support of additional monitoring frequency and stations, if necessary;
- The Contractor to identify remedial measures in consultation with the IEC, ET and ER if a complaint is valid and due to the construction works of the Project;
- The Contractor to implement the remedial measures as required by the ER and to agree with the ET and IEC any additional monitoring frequency and stations, where necessary, for checking the effectiveness of the remedial measures;
- The ER, ET and IEC to review the effectiveness of the Contractor's remedial measures and the updated situation;
- The ET to undertake monitoring and audit to verify the situation if necessary, and oversee that circumstances leading to the complaint do not recur;
- If the complaint is referred by the EPD, the Contractor to prepare interim report on the status of the complaint investigation and follow-up actions stipulated above, including the details of the remedial measures and monitoring identified or already taken, for submission to EPD within the time frame assigned by the EPD; and
- The ET to record the details of the complaint, results of the investigation, subsequent actions taken to address the complaint and updated situation including the effectiveness of the remedial measures, supported by regular and additional monitoring results in the monthly EM&A reports.

13 Reporting

13.1 General

13.1.1 Types of reports that the ET shall prepare and submit include Baseline Monitoring Report, Monthly EM&A Report and Final EM&A Report. In accordance with Annex 21 of the EIAO-TM, a copy of the monthly and final EM&A reports shall be made available to the Director of Environmental Protection.

13.1.2 Reports can be provided in an electronic medium upon agreeing the format with the ER and EPD. This would enable a transition from a paper / historic and reactive approach to an electronic / real time proactive approach. All the monitoring data shall also be submitted on diskettes or other approved medium. The formats for monitoring data to be submitted shall be separately agreed.

13.2 Baseline Monitoring Report

13.2.1 The ET shall prepare and submit a Baseline Monitoring Report at least 2 weeks before the commencement of construction of the Kwu Tung Station. Copies of Baseline Monitoring Report shall be submitted to the IEC, the ER and EPD. The ET shall liaise with the relevant parties on the required number of copies.

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

- Up to half a page executive summary;
- Brief project background information;
- Drawings showing locations of the baseline monitoring stations;
- Monitoring results (in both hard and diskette copies) together with the following information:
  - Monitoring methodology;
  - Name of laboratory and types of equipment used and calibration details;
  - Parameters monitored;
  - Monitoring locations;
  - Monitoring date, time, frequency and duration; 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 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.

13.3 Monthly Monitoring Reports

13.3.1 The results and findings of all EM&A work required in the Manual shall be recorded in the monthly EM&A reports prepared by the ET and endorsed by the IEC. The EM&A report shall be prepared and submitted to EPD within 10 working days of the end of each reporting month. Copies of monthly EM&A report shall be submitted to the IEC, the ER and EPD. Before submission of the first monthly EM&A Report, the ET shall liaise with the relevant parties on the required number of copies and format of the monthly reports in both hard copy and electronic medium.

13.3.2 The ET shall review the number and location of monitoring stations and parameters on as needed basis, in order to cater for any changes in the surrounding environment and the nature of works in progress.

First Monthly EM&A Report

13.3.3 The first monthly EM&A report shall include at least the following:

13.3.3.1 Executive summary:

- Breaches of Action and Limit levels;
- Compliant log;
- Notifications of any summons and successful prosecutions;
- Reporting changes; and
- Future key issues.

13.3.3.2 Basic project information:

- Project organisation including key personnel contact names and telephone numbers;
- Programme;
- Management structure; and
- Work undertaken during the month.

13.3.3.3 Environmental status:

- Advice on the status of statutory environmental compliance such as the status of compliance with the environmental permit (EP) conditions under the EIAO,

submission status under the EP and implementation status of mitigation measures;

- Works undertaken during the month with illustrations (such as location of works, daily excavation rate, etc.); and
- Drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring stations (with co-ordinates of the monitoring locations).

13.3.3.4 A brief summary of EM&A requirements including:

- All monitoring parameters;
- Environmental quality performance limits (Action and Limit levels);
- Event and Action Plans;
- Environmental mitigation measures, as recommended in the ERR Report; and
- Environmental requirements in contract documents.

13.3.3.5 Implementation status

- Advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the ERR Report.

13.3.3.6 Monitoring results (in both hard and diskette copies) together with the following information:

- Monitoring methodology;
- Name of laboratory and types of equipment used and calibration details;
- Monitoring parameters;
- Monitoring locations;
- Monitoring date, time, frequency, and duration;
- Weather conditions during the period;
- Any other factors which might affect the monitoring results; and
- QA/QC results and detection limits.

13.3.3.7 Report on non-compliance, complaints, and notifications of summons and successful prosecutions:

- Record of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
- Record of all complaints received for each media, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
- Record of all notification of summons and successful prosecutions for breaches of current environmental protection / pollution control 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-compliances, 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.

13.3.3.8 Others

- An account of the future key issues as reviewed from the works programme and work method statements;
- Advice on the solid and liquid waste management status;
- Record of any project changes from the originally proposed as described in the ERR (e.g. construction methods, mitigation proposals, design changes, etc.); and
- Comments (for example, effectiveness and efficiency of the mitigation measures), recommendations (for example, any improvement in the EM&A programme) and conclusions.

Subsequent Monthly EM&A Reports

13.3.4 Subsequent monthly EM&A reports shall include at least the following:

13.3.4.1 Executive summary (1-2 pages):

- Breaches of Action and Limit levels;
- Compliant log;
- Notifications of any summons and successful prosecutions;
- Reporting changes; and
- Future key issues.

13.3.4.2 Basic project information:

- Project organisation including key personnel contact names and telephone numbers;
- Programme;
- Management structure; and
- The work undertaken during the month; and
- Any updates as needed to the scope of works and construction methodologies.

13.3.4.3 Environmental status:

- Advice on the status of statutory environmental compliance such as the status of compliance with the EP conditions under the EIAO, submission status under the EP and implementation status of mitigation measures;
- Works undertaken during the month with illustrations (such as location of works, daily excavation rate, etc.); and

- Drawings showing the Project area, any environmental sensitive receivers and the locations of the monitoring stations (with co-ordinates of the monitoring locations).

13.3.4.4 Implementation status

- Advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the ERR.

13.3.4.5 Monitoring results (in both hard and diskette copies) together with the following information:

- Monitoring methodology;
- Name of laboratory and types of equipment used and calibration details;
- Monitoring parameters;
- Monitoring locations;
- Monitoring date, time, frequency, and duration;
- Weather conditions during the period;
- Any other factors which might affect the monitoring results; and
- QA/QC results and detection limits.

13.3.4.6 Report on non-compliance, complaints, and notifications of summons and successful prosecutions:

- Record of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
- Record of all complaints received for each media, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
- Record of all notification of summons and successful prosecutions for breaches of current environmental protection / pollution control 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-compliances, 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.

13.3.4.7 Others

- An account of the future key issues as reviewed from the works programme and work method statements;
- Advice on the solid and liquid waste management status;

- Record of any project changes from the originally proposed as described in the ERR (e.g. construction methods, mitigation proposals, design changes, etc.); and
- Comments (for example, effectiveness and efficiency of the mitigation measures), recommendations (for example, any improvement in the EM&A programme) and conclusions.

13.3.4.8 Appendices

- Action and Limit levels;
- Graphical plots of trends of the monitoring parameters at key stations over the past four reporting periods for representative monitoring stations annotated against the following:
  - major activities being carried out on site during the period;
  - weather conditions during the period; and
  - any other factors that might affect the monitoring results.
- Monitoring schedule for the present and next reporting period;
- Cumulative statistics on complaints, notifications of summons and successful prosecutions; and
- Outstanding issues and deficiencies.

13.4 Final EM&A Review Report

13.4.1 The EM&A program shall be terminated upon completion of the construction activities that have the potential to result in a significant environmental impact.

13.4.2 Prior to the proposed termination, the proposed termination shall only be implemented after the proposal has been endorsed by the IEC followed by approval from the Director of Environmental Protection.

13.4.3 The final EM&A report shall contain at least the following information:

(i) Executive summary (1-2 pages):

(ii) Drawings showing the Project area, any environmental sensitive receivers and locations of monitoring stations;

(iii) Basic project information including a synopsis of the project organisation, contacts of key management, and a synopsis of work undertaken during the course of the Project or past twelve months;

(iv) A brief summary of EM&A requirements including:

- Environmental mitigation measure, as recommended in the ERR;
- Environmental impact hypotheses tested;
- Environmental quality performance limits (Action and Limit levels);
- All monitoring parameters; and

- Event and Action Plans.

(v) A summary of the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the project ERR Report, and summarised in the updated implementation schedule;

(vi) Graphical plots and the statistical analysis of the trends of monitoring parameters over the course of the Project, including:

- 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;

(vii) A summary of non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);

(viii) A review of the reasons for and the implications of non-compliance including review of pollution sources and working procedures as appropriate;

(ix) A description of the actions taken in the event of non-compliance;

(x) A summary record of all complaints received for each media, liaison and consultation undertaken, actions and follow-up actions taken and results;

(xi) A review of the validity of ERR predictions and identification of shortcomings in ERR recommendations;

(xii) Comments (for example, a review of the effectiveness and efficiency of the mitigation measures and of the performance of the environmental management system, that is, of the overall EM&A programme); and

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

13.5 Data Keeping

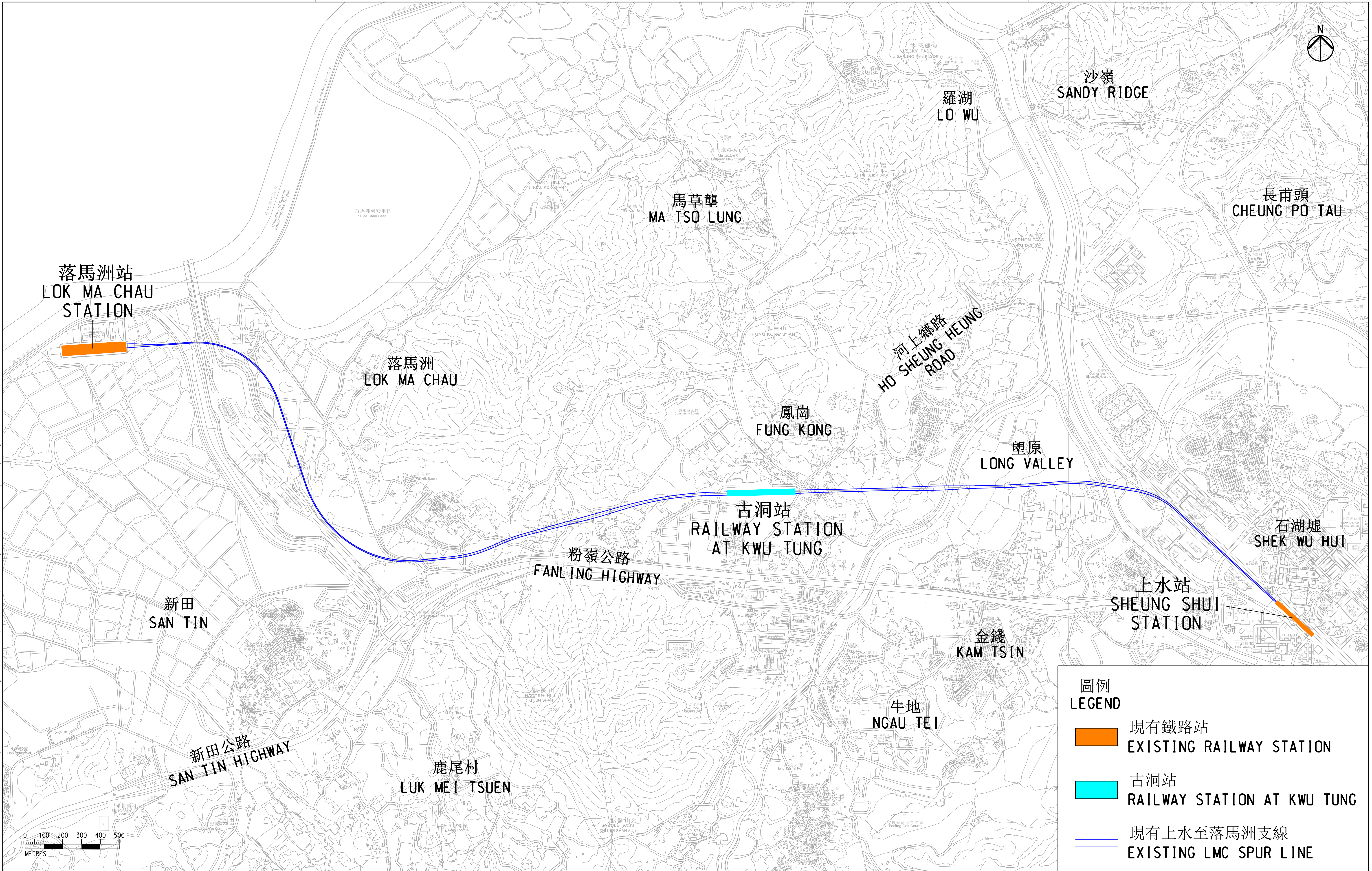
13.5.1 No site-based documents (such as monitoring field records, laboratory analysis records, site inspection forms, etc.) are required to be included in the monthly EM&A reports. However, any such document shall be well kept by the ET and be ready for inspection upon request. All relevant information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

13.6 Interim Notifications of Environmental Quality Limit Exceedances

13.6.1 With reference to the Event and Action Plans, when the environmental quality performance limits are exceeded and if they are proven to be valid, the ET should

immediately notify the IEC and EPD, as appropriate. The notification should be followed up with advice to the IEC and EPD on the results of the investigation, proposed actions and success of the actions taken, with any necessary follow-up proposals. A sample template for the interim notification is presented in **Appendix 13.1**.

Figures



REV	DESCRIPTION	BY	DATE	APPROVED
B	SECOND ISSUE	BS	11/21	FC
A	FIRST ISSUE	BS	09/21	FC

DRAWN BS
DESIGNED BS
CHECKED JC
APPROVED FC
DATE 16/11/21

MTR

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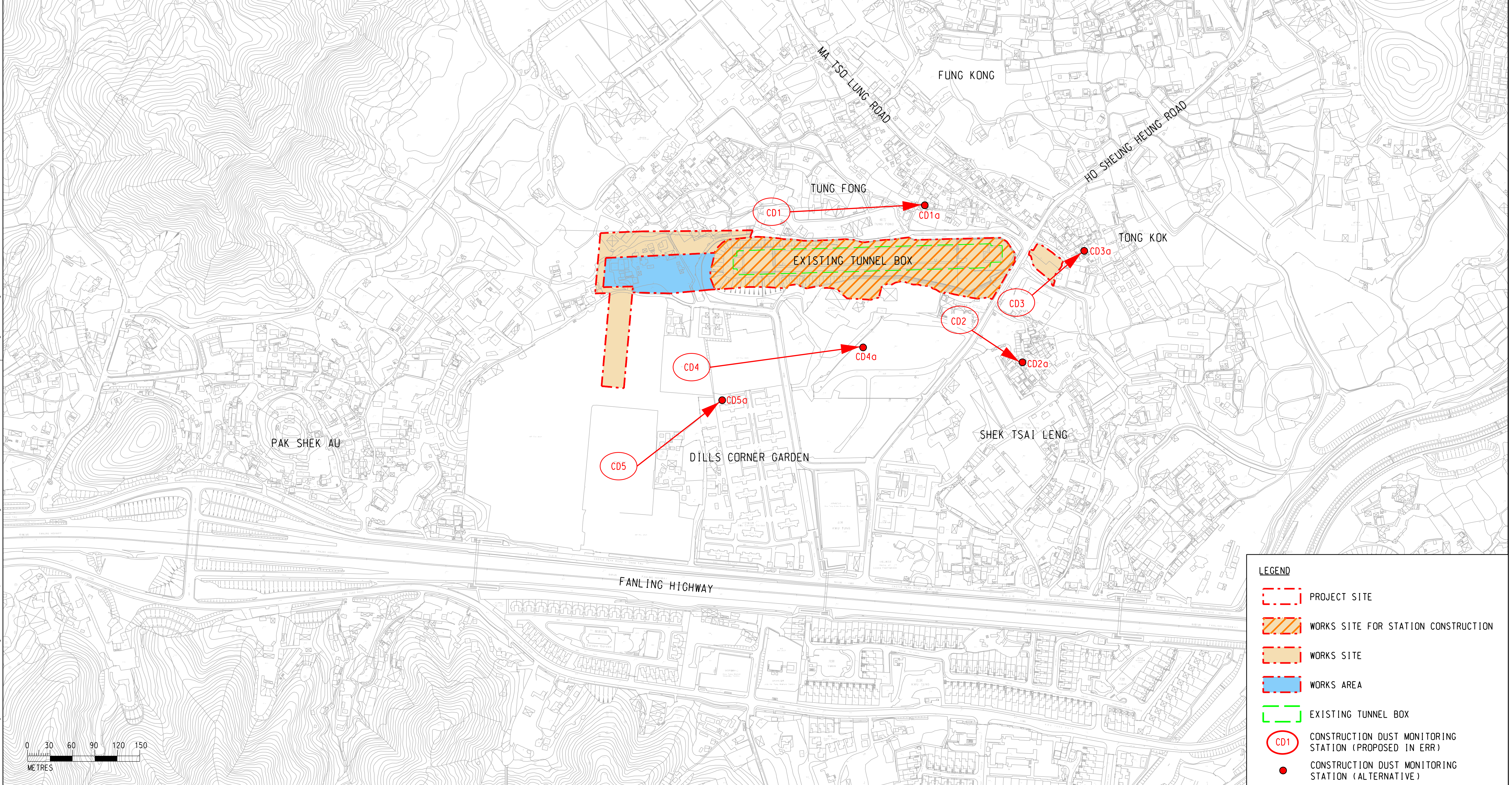
CADD REF. Figure 2.1 - Location of the Project

TITLE
VARIATION OF ENVIRONMENTAL PERMIT (VEP)
OF SHEUNG SHUI TO LOK MA CHAU SPUR LINE
LOCATION OF THE PROJECT

SCALE AS SHOWN
DRAWING NO. FIGURE 2.1
REV. B

Monitoring Station ID	Construction Dust Monitoring Station (Proposed in ERR)	Monitoring Station ID	Construction Dust Monitoring Station (Alternative)
CD1	Village Houses near Tung Fong	CD1a	Village Houses along Ma Tso Lung Road
CD2	Sheung Shui Pui Yau Kindergarten	CD2a	Village Houses near Shek Tsai Leng
CD3	Village Houses along Ho Sheung Heung Road	CD3a	Village Houses near Ho Sheung Heung Road
CD4	Planned Private Housing	CD4a	Construction site office of Advance Site Formation and Engineering Infrastructure Works at Kwu Tung North and Fanling North New Development Areas – Contract No. ND/2019/06
CD5	Planned Multi Welfare Service Complex	CD5a	Dills Corner Garden



REV	DESCRIPTION	BY	DATE	APPROVED
B	THIRD ISSUE	AY	09/22	FC
B	SECOND ISSUE	BS	10/21	FC
A	FIRST ISSUE	BS	09/21	FC

DRAWN	AY
DESIGNED	BS
CHECKED	JC
APPROVED	FC
DATE	08/09/22

MTR

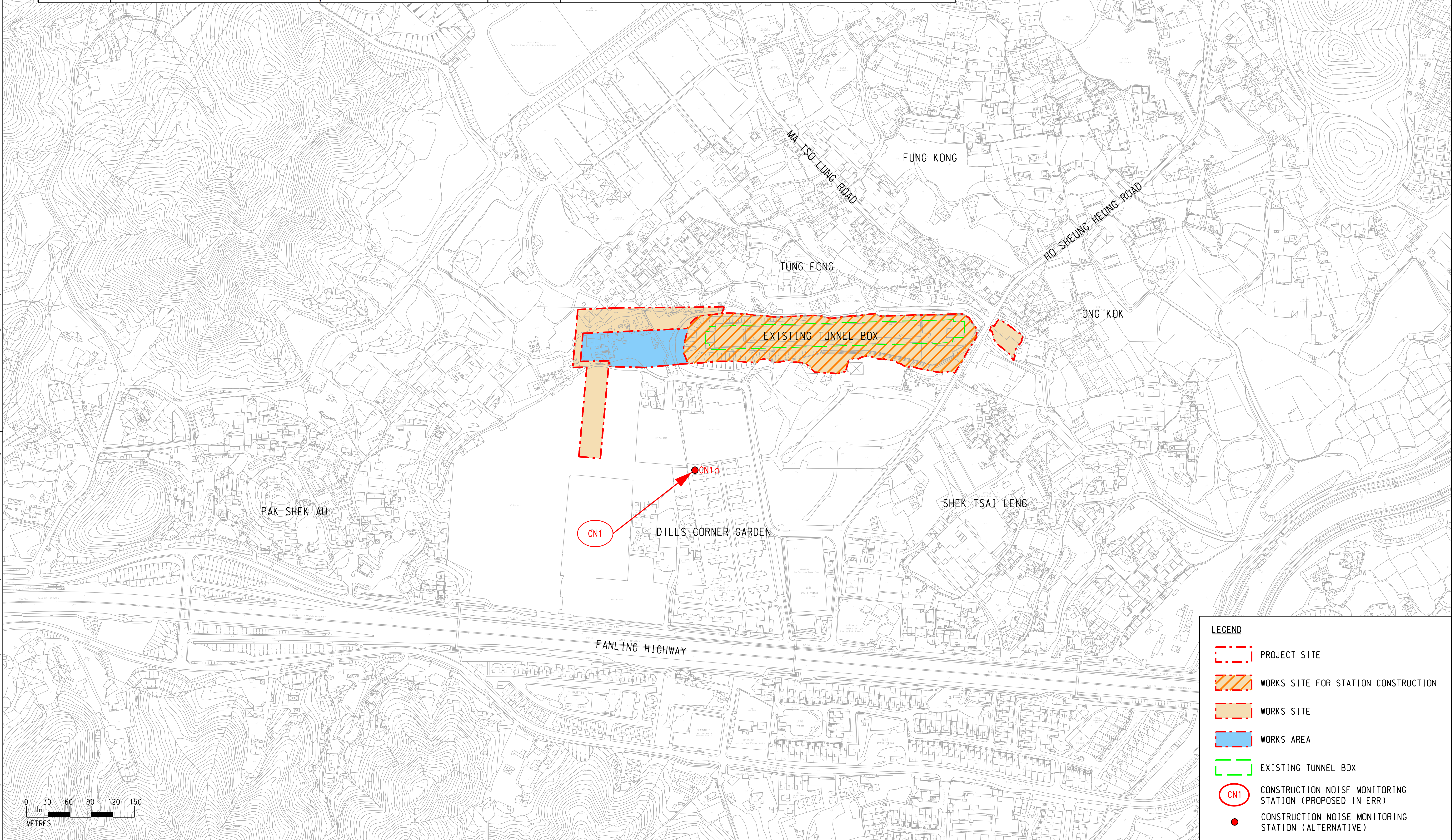
ORIGINATOR ARUP Supported by : Arcadis Hong Kong Ltd.

CADD REF. Figure 5.1 - Locations of Construction Dust Monitoring Stations

TITLE
VARIATION OF ENVIRONMENTAL PERMIT (VEP) OF SHEUNG SHUI TO LOK MA CHAU SPUR LINE
LOCATION OF CONSTRUCTION DUST MONITORING STATION

SCALE 1 : 5000 (A3) DRAWING NO. FIGURE 5.1 REV. B

Monitoring Station ID	Construction Noise Monitoring Station (Proposed in ERR)	Monitoring Station ID	Construction Noise Monitoring Station (Alternative)
CN1	Planned Multi Welfare Service Complex	CN1a	Dills Corner Garden



LEGEND

- PROJECT SITE
- WORKS SITE FOR STATION CONSTRUCTION
- WORKS SITE
- WORKS AREA
- EXISTING TUNNEL BOX
- CN1 CONSTRUCTION NOISE MONITORING STATION (PROPOSED IN ERR)
- ● CONSTRUCTION NOISE MONITORING STATION (ALTERNATIVE)

PLOT DRV: \\global\EastAsia\HKG\Group\CENV\common\Microstation standard\Plotdrv\HP_ArupHK_A3-PDF-C_ENV.plt
MODELNAME: $MODEL$ PRINTED BY: HKGTRA014 10/13/2022 5:52:23 PM
FILENAME: \\global.arup.com\EastAsia\HKG\Projects\281000\281521-00 C1601KTU\05_Int_Proj_Data\08 Env\13 Drawing Deliverables\report\6 EM&A Manuel\Figure 6.1 - Locations of Noise Monitoring Station.dgn

REV	DESCRIPTION	BY	DATE	APPROVED
B	THIRD ISSUE	AY	09/22	FC
B	SECOND ISSUE	BS	10/21	FC
A	FIRST ISSUE	BS	09/21	FC

DRAWN	AY
DESIGNED	BS
CHECKED	JC
APPROVED	FC
DATE	08/09/22

MTR

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Supported by : Arcadis Hong Kong Ltd.

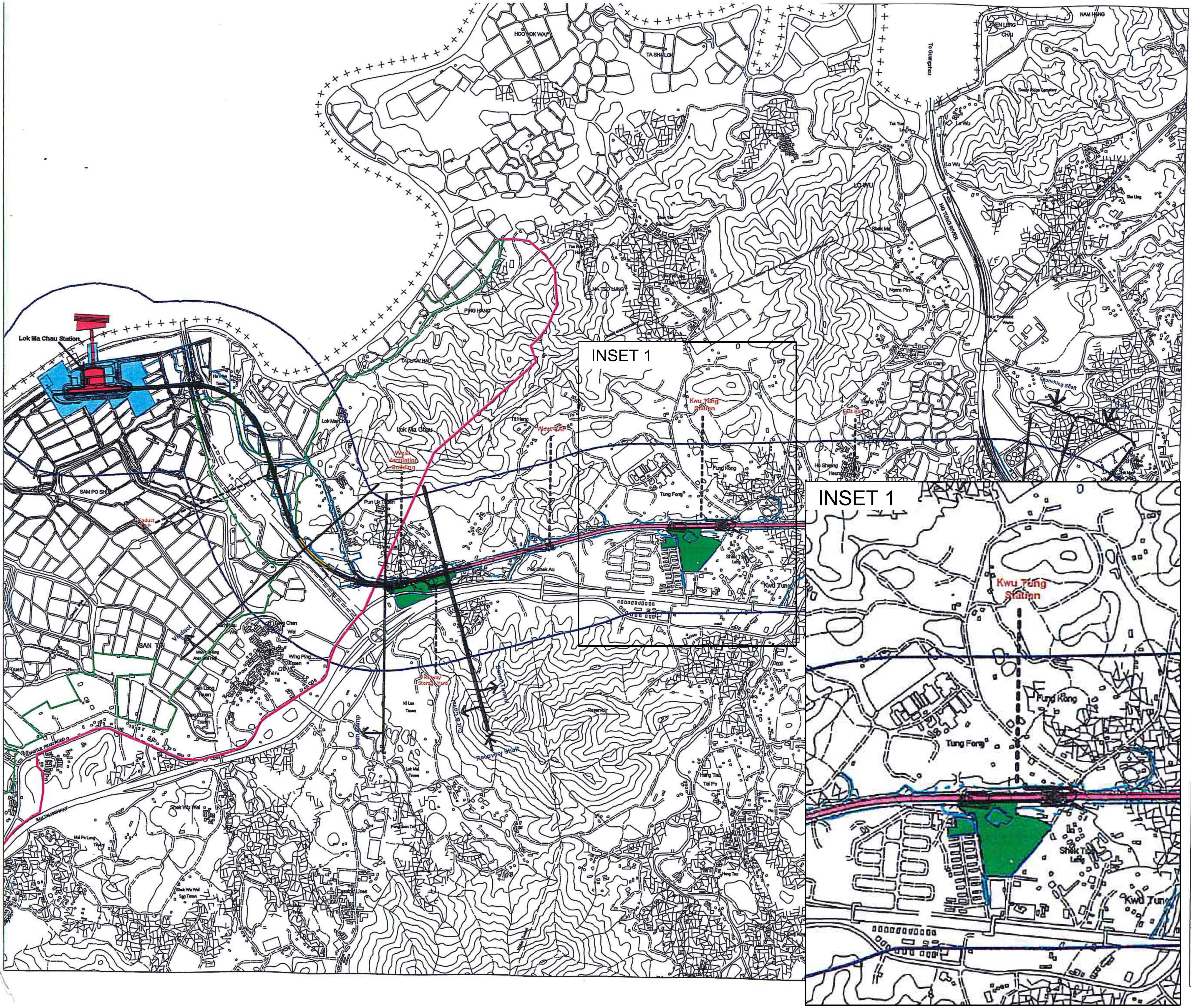
CADD REF. Figure 6.1 - Locations of Noise Monitoring Stations

TITLE
VARIATION OF ENVIRONMENTAL PERMIT (VEP) OF SHEUNG SHUI TO LOK MA CHAU SPUR LINE
LOCATION OF NOISE MONITORING STATION

SCALE 1 : 5000 (A3) | DRAWING NO. FIGURE 6.1 | REV. B

Appendix 1.1

Demarcation of Kwu Tung Station in Approved EIA for LMC Spur Line



Map data reproduced with permission of the Director of Lands(C) Hong Kong

Legend:-

- Spur Line track
- 500m boundary from Spur Line
- Approximate boundary of the Town Planning Board Wetland Buffer Area
- Approximate boundary of the Town Planning Board Wetland Conservation Area
- Scheme boundary for Spur Line
- Works areas for LDB201
- Works areas for LCC300

Spurline Alignment :

- Bored Tunnel
- Viaduct
- Cut & Cover
- Open Ramp

No.	Description	By	Date
REVISIONS			

DRAWING STATUS

SIGNATURE

ISSUE DATE

KCR 九廣鐵路

East Rail Extensions
東鐵支線

BINNIE BLACK & VEATCH HONG KONG LTD

FILE REF.

CAD FILE NO.

JOB TITLE
SHEUNG SHUI-
LOK MA CHAU
SPUR LINE

DRAWING TITLE
Horizontal Alignment of
Spur Line and the Study Area

SCALE	DRAWING NO.
1 : 20000	2.1

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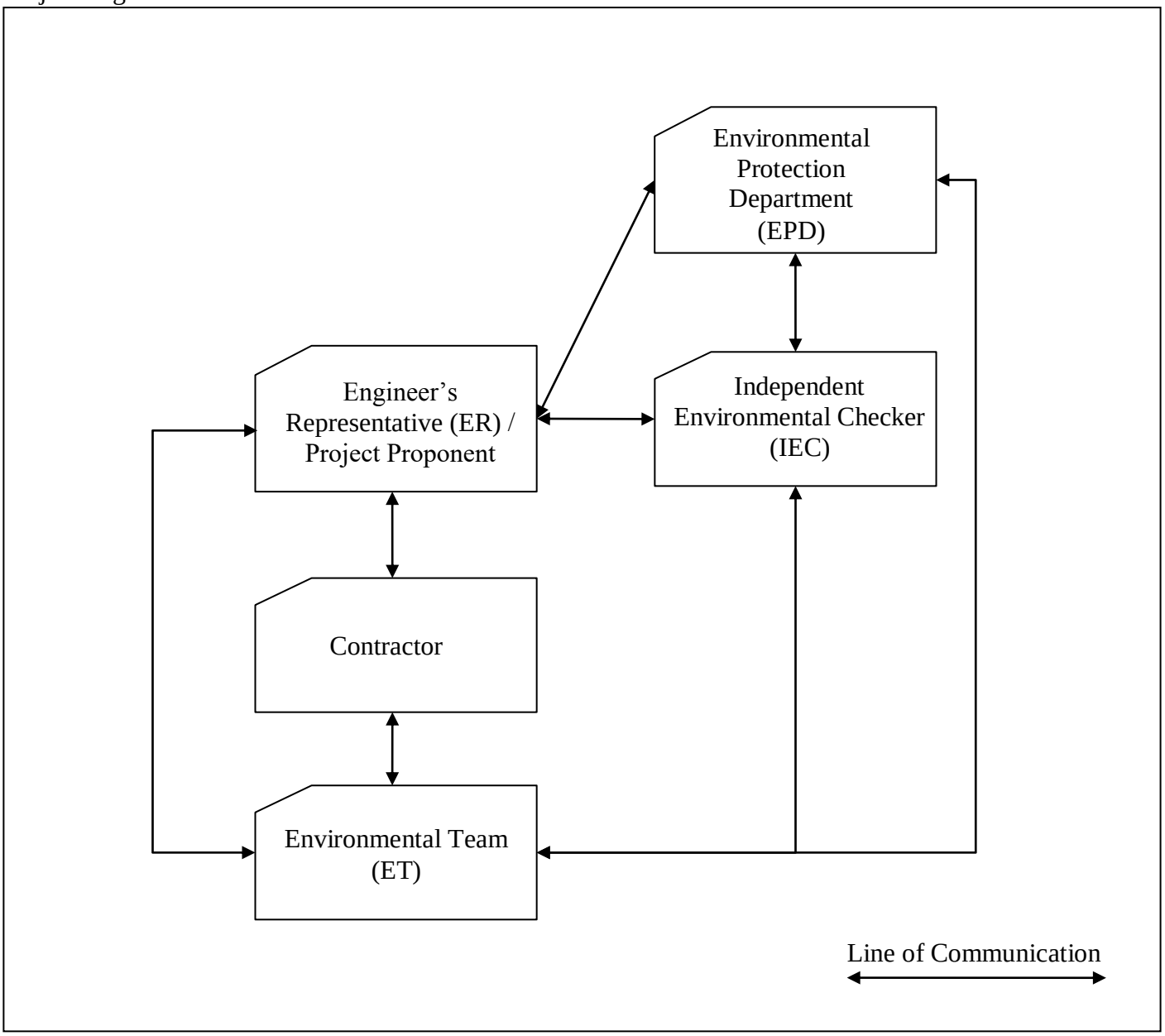
Appendix 1.2

Project Organisation for Environmental Works

Project Organisation for Environmental Works



Appendix 5.1

Environmental Mitigation
Implementation Schedule

Environmental Mitigation Implementation Schedule
Sheung Shui to Lok Ma Chau Spur Line

Note: Sections 1to 3 of the ERR report present the background information of the Project, identified concurrent projects, objectives, proposed amendments under VEP application and the environmental changes arising from the proposed amendments. Sections 4 to 13 of the ERR report present the ERR findings and mitigation measures are described below with cross-reference to the ERR report. Section 14 describe the environmental monitoring and audit requirements. Sections 15 and 16 summary the justification on material change and conclusion.

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
Construction Dust Impact							
S7.5.3	D1	The following dust suppression measures/practices should be incorporated: • undertaking at all times to prevent dust nuisance as a result of the activities. Effective dust suppression measures, as necessary, should be installed to minimise air quality impacts, at the boundary of the site and at any sensitive receivers. • Frequently cleaning and watering the site to minimise fugitive dust emissions. • Effective water sprays shall be used during the delivery and handling of all raw sand, aggregate and other similar materials, when dust is likely to be created, to dampen all stored materials during dry and windy weather. • Watering of exposed surfaces shall be conducted as often as possible depending on the circumstances. • Areas within the site where there is a regular movement of vehicles shall have an approved hard surface, be kept clear of loose surface materials and / or regularly watered. • Where dusty materials are being discharged to vehicle from a conveying system at fixed transfer point, a three-sided roofed enclosure with a flexible curtain across the entry shall be provided. Exhaust	Minimise dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction phase	• APCO • To control the dust impact to meet HKAQO and EIAO-TM

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		fans shall be provided for this enclosure and vented to a suitable fabric filter system. • Confine haulage and delivery vehicles to designated roadways inside the site. If in the opinion of the Engineer, any motorised vehicle is causing dust nuisance, the Engineer may require that the vehicle be restricted to a maximum speed of 15 km per hour while within the site area. • Wheel cleaning facilities shall be installed and used by all vehicles leaving the site. No earth, mud, debris, dust and the like shall be deposited on public roads. Water in the wheel cleaning facility shall be changed at frequent intervals and sediments shall be removed regularly. The Contractor shall submit details of proposals for the wheel cleaning facilities to the Engineer prior to construction of the facility. Such wheel cleaning facilities shall be usable prior to any earthwork excavation activity on site. The Contractor shall provide a hard-surfaced road between any cleaning facility and the public road. • Any stockpile of dusty material shall 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 so as to maintain the entire surface wet. • Chemical wetting agents shall only be used on completed cuts and fills to reduce wind erosion. • All site vehicular exhausts should be directed vertically upwards or directed away from ground to minimise dust nuisance as far as practicable. • Ventilation system, equipped with proprietary filters, should be provided to ensure the safe					

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		working environment inside the tunnel. Particular attention should be paid to the location and direction of the ventilation exhausts. The exhausts should not be allowed to face any sensitive receivers directly. Consideration should also be given to the location of windows, doors and direction of prevailing winds in relation to the nearby sensitive receivers. The following measures related to stockpiling, loading and unloading activities should be incorporated: • The working area of any excavation or earthmoving operation shall spray with water immediately before, during and immediately after the operation so as to maintain the entire surface wet; • Exposed earth shall be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies; • Any stockpile of dusty materials shall be either covered entirely by impervious sheeting or placed in an area sheltered on the top and three sides; and sprayed with water so as to maintain the entire surface wet; and • Other suitable dust control measures as stipulated in the Air Pollution Control (Construction Dust) Regulation, where appropriate, should be adopted.					

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
S7.5.3	D2	The following good site practices to reduce the exhaust emission from the use of non-road mobile machinery and construction plant and equipment should be implemented: • Regulated machines shall be used and exempted NRMMs should be avoided where practicable. • Use cleaner fuel such as Ultra Low Sulphur Diesel (ULSD) in diesel-operated construction plant to reduce sulphur dioxide emission. • Use of electric PMEs where practicable. • Use power supplied from power utilities when practicable (e.g. to replace generators). • Switch off the engine of PMEs when idling. • Implement regular and proper maintenance for plant and equipment. • Employ plant and equipment of adequate size and power output and avoid overloading of the plant. • Locate the PMEs away from sensitive receivers as far as possible. • Erect screen to shield the emission source from sensitive receivers where necessary and practicable.	Control emissions from non-road mobile machinery	Contractor	All construction sites	Construction phase	• Air Pollution Control (NRMMs)(Emission) Regulation • To control the fuel combustion emission from PMEs
S14.3.3.4	D3	Implement regular dust monitoring under EM&A programme during the construction phase.	Monitoring of dust impact	Contractor	Selected dust monitoring stations	Construction phase	• EIAO-TM
Construction Noise							
S8.4.4.1	N1	The following good site practices to reduce the noise impact from construction site activities, the following measures should be implemented:	Control construction airborne noise	Contractor	All construction	Construction phase	• Annex 5, EIAO-TM

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		• only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers which available on construction equipment should be properly fitted and maintained during the construction works; • spoil transportation routes should be directed away from NSRs as far as practicable; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities; • noise monitoring at selected NSRs should be conducted as far as practicable; and • provide designated unloading areas away from the NSR as far as possible.			sites		
S8.4.4.2	N2	Use of quiet plant, where necessary should be made reference to the Powered Mechanical Equipment (PME) listed in the Technical Memorandum or the Quality Powered Mechanical Equipment (QPME) / other commonly used	Reduce the noise levels from plant items	Contractor	All construction sites where	Construction phase	• Annex 5, EIAO-TM

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		PME listed in Environmental Protection Department (EPD) web pages as far as possible which includes the Sound Power Level (SWLs) for specific quiet PME.			practicable		
S8.4.4.3	N3	Install movable temporary noise barriers (typical design is material surface density of 10kg/m2 could achieve at least 5dB(A) reduction for movable plant and 10dB(A) for stationary plant.), and full enclosure, screen the noisy plants including air compressor and generator etc.	Minimise the construction noise levels through screening	Contractor	All construction sites	Construction phase	• Annex 5, EIAO-TM
S14.3.3.5	N4	Implement regular airborne construction noise monitoring under EM&A programme.	Monitor the airborne construction noise levels at the selected representative locations	Contractor	Proposed noise monitoring stations	Construction phase	• Annex 5, EIAO-TM
Operational Fixed Plant Noise							
S8.5.2.1	N5	Housing all noisy equipment inside the plantroom with sufficient sound insulation and sound attenuators for all air louvers (e.g. install plant rooms with fresh air louvres, exhaust air louvres, smoke discharge louvres, etc.) in order to reduce the typical planned fixed noise sources for railway station at the proposed entrances (incorporated with VB) and proposed FRS, including ventilation fans, smoke extraction fans, chillers etc.	Minimise the operational fixed plant noise	Contractor	Construction of railway station at the proposed entrances (incorporated with VB) and proposed FRS	Operational phase	• Annex 5, EIAO-TM
S8.5.2.2	N6	The following good site practices to reduce the noise impact on fixed noise sources, the following measures shall be considered as far as practicable to minimise any potential impacts: • Equipment should be placed in a plant room with thick walls or at a much greater distance from the receiver or behind some large enough obstruction (e.g. a building or a barrier);	Control the operational fixed plant noise	Contractor	Construction of railway station at the proposed entrances (incorporated with VB) and proposed FRS	Operational phase	• Annex 5, EIAO-TM

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		• Quieter plant should be chosen as far as practicable; • Noise levels specification should be included when ordering new plant items; • All openings, including louvres for ventilation and machine room doors should be oriented away from the NSRs as far as practicable; • Silencers, acoustic louvres or acoustic doors should be used where necessary; and • Regularly scheduled plant maintenance programme should be developed and implemented so that plant items are properly operated and serviced.					
S14.3.3.5	N7	Fixed plant commissioning tests shall be conducted for each planned fixed noise source.	To ensure the compliance of predicted the maximum allowable Sound Power Level	Contractor/ MTR Corporation	Each planned fixed noise source	Prior to operational phase	• NCO • EIAO-TM
Water Quality (Construction Phase)							
S9.3.2.2	W1	<u>General Construction Activities</u> Best Management Practices (BMPs) should be implemented as far as practicable according to The Professional Persons Environmental Consultative Committee (ProPECC) Practice Note (PN) 1/94 "Construction Site Drainage". The details of BMPs are presented as follows: • The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94. The detailed design of the sand/silt traps should be undertaken by the contractor prior to the commencement of construction;	To reduce water quality impact from construction site runoff and general construction activities	Contractor	All construction sites	Construction phase	• WPCO • ProPECC (PN1/94) • EIAO-TM • DSS-TM • Technical Circular No. 1/2017 • Practical Notes No.

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		• Schedule construction works to minimise surface construction works during the rainy seasons (April to September). If excavation of spoil cannot be avoided in these months or at any time of year when rainstorms are likely, for the purpose of preventing soil erosion, temporary exposed slope surfaces shall be covered e.g. by tarpaulin, and temporary access roads shall be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels shall be provided (e.g. along the crest / edge of excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements shall always be in place in such a way that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm; • Inspect and maintain all drainage facilities and erosion and sediment control structures regularly to ensure proper and efficient operation at all times and particularly following rainstorms; • Cover all construction materials at temporary storage area with tarpaulin or similar fabric, and temporary access roads shall be protected by crushed stone or gravel, as excavation proceeds during rainstorms and implementation of measures to prevent the washing away of construction materials, soil, silt or debris into any drainage system; • Intercepting channels shall be provided (e.g. along the crest / edge of excavation) to prevent storm runoff from washing across exposed soil surfaces during rainstorm; • Cover manholes (including newly constructed ones), if any, adequately and seal temporarily to prevent silt, construction materials or debris being					1/2017

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		washed into the drainage system and storm runoff being directed into foul sewers; • Take precautions at any time of year when rainstorms are likely. The actions to be taken based on the guidelines in Appendix A2 of ProPECC PN 1/94; • Collect, handle and dispose construction solid waste, debris and rubbish on site to avoid water quality impacts; • Provide locks for all fuel tanks and storage areas and locate on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive receivers nearby; and • Regular environmental audit on the construction site should be carried out in order to prevent any malpractices. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the water bodies, marsh and ponds.					
S9.3.2.1	W2	<u>Mitigation measures/ enhancement measures during demolition of watercourse</u> • any surface runoff would be diverted by temporary drain or pumped away and treated by sedimentation tanks before discharge. • All discharge to stormwater drain should be followed discharge licence under the Water Pollution Control Ordinance (WPCO)	To avoid the untreated surface run-off being accidentally discharged into the adjoining water bodies.	Contractor	watercourse	Construction phase	• WPCO • ProPECC (PN1/94) • EIAO-TM • DSS-TM
S9.3.2.3	W3	<u>Mitigation measures for effluent discharge from excavation</u>	To minimize the water quality impact from the	Contractor	All construction	Construction phase	• WPCO • ProPECC

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		• Wastewater from excavation with a high level of suspended solids should be filtered before discharge by settlement in tanks with sufficient retention time. • Oil interceptors would be required to remove any oil, lubricants, and grease from wastewater. • All discharge to stormwater drain should be followed discharge licence under the Water Pollution Control Ordinance (WPCO) • The contractor should be monitor the quantity and quality of effluent discharge to ensure compliance with the conditions of the discharge license	wastewater generated form excavation		sites		(PN1/94) • EIAO-TM • DSS-TM
S9.3.2.4	W5	<u>Sewage Effluent from Construction Workforce</u> • No discharge of sewage to the stormwater system and marine water will be allowed; • Establish adequate and sufficient portable chemical toilets in the works areas to handle sewage from the construction workforce; • Employ a licenced waste collector to clean and maintain the chemical toilets on a regular basis; and • Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the surrounding environment.	To reduce water quality impact from wastewater from construction workforce.	Contractor	All construction sites	Construction phase	• WPCO • ProPECC (PN1/94) • EIAO-TM • DSS-TM
S9.3.2.5	W6	<u>Accidental Spillage</u> • Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities;	To minimise water quality impact from accidental spillage of chemicals	Contractor	All construction sites	Construction phase	• WPCO • ProPECC (PN1/94) • EIAO-TM

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		• Any chemical waste generated shall be managed in accordance with the Waste Disposal (Chemical Waste) (General) Regulation; • The Contractor should develop management procedures for chemicals used and prepare an emergency spillage handling procedure to deal with chemical spillage in case of an accident occurs; • Any services and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with the potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges; • The service and maintenance as well as any chemical storage area would be avoided to position near the watercourse as a safe guard; • The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance shall be followed to deal with chemical wastes; • Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling, and transport; • Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents; and • Storage area should be selected at a safe location on-site and adequate space should be allocated to the storage area.					• DSS-TM • WDO

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
Water Quality (Operational Phase)							
S9.4.2.1	W7	The following mitigation measures for stormwater surface runoff will be implemented. • Stormwater surface runoff generated should be discharged to the nearby government drainage system. • The rainwater runoff from station structures (e.g. ventilation building, entrance, etc.) is provided with peripheral drain conveying to government drainage.	To minimize the water quality impact from stormwater surface runoff	MTR Corporation	Whole alignment	Operational Phase	• WPCO
S9.4.2.2	W8	The following mitigation measures for sewage and other wastewater will be implemented. • Sewage effluents including the sewage from the sanitary fitment and the foul water from washing facilities and track of the proposed railway station at Kwu Tung should be conveyed to the public sewers. • During the interim phase, the sewage will be connecting to the public sewer at the west. • As for the ultimate phase, the sewage will be conveyed to the public sewer along Road L3 of Kwu Tung North New Development Area. • Standard oil/grit interceptors/chambers should be provided where necessary to remove the oil, lubricants, grease, silt, and grit from wastewater generated from facilities washing before discharge to public sewers. • A discharge licence for the discharge of commercial and industrial effluent is needed and the discharge quality must satisfy all the standards listed in the	To minimize the water quality impact from sewage and other wastewater	MTR Corporation	Whole alignment	Operational Phase	• WPCO • ProPECC PN 5/93 • DSS-TM

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		DSS-TM and meet the requirements specified in the discharge licence. • The practices outlined in ProPECC PN 5/93 for handling, treatment, and disposal of operational stage effluent should also be adopted where applicable.					
Waste Management (Construction Phase)							
S10.2.2.1	WM1	Good Site Practices The following good site practices are recommended to reduce waste generation during construction: • Nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all waste generated at the site; • Training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; • Provision of sufficient waste disposal points and regular collection for disposal; • Appropriate measures to minimise windblown litter and dust during transportation of waste by transporting waste in enclosed containers; • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • A Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) should be prepared by the Contractor in accordance with ETWB	Ensure proper waste management system throughout the construction	Contractor	All construction sites	Construction phase	• WDO • ETWB TC(W) 19/2005

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		TC(W) No.19/2005 and submitted to the Engineer for approval before construction works.					
S10.2.2.2	WM2	<u>Waste Reduction Measures</u> The following recommendations are proposed to achieve reduction of waste: • Segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; • Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste; • Sort out demolition debris from demolition works to recover reusable/ recyclable portions (i.e. Soil, broken concrete, metal etc.); and • Provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling.	Reduce waste generation	Contractor	All construction sites	Construction phase	• WDO
S10.2.2.3	WM3	<u>Storage, Collection and Transportation of Waste</u> The following recommendation should be implemented to minimise the impacts from storage, collection and transportation of waste: • Non-inert C&D materials (if any) should be handled and stored well to ensure secure containment; • Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; • Different locations should be designated to stockpile each material to enhance reuse; • Remove waste in timely manner;	Minimise impact to the environment due to storage, collection and transport of waste	Contractor	All construction sites	Construction phase	• WDO • Land (Miscellaneous Provisions) Ordinance • ETWB TCW No. 19/2005

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		• Employ the trucks with cover or enclosed containers for waste transportation; • Obtain relevant waste disposal permits from the appropriate authorities; and • Disposal of waste should be done at licensed waste disposal facilities.					
S10.2.2.4	WM4	<u>C&D Materials</u> The following recommendation should be implemented in handling the C&D materials: • Carry out on-site sorting; • Allow and promote the use of recycled aggregates where appropriate; and • Implement a trip-ticket system in accordance with DEVB TC(W) No. 6/2010 Trip Ticket System for Disposal of Construction and Demolition Materials, if dumping trucks are required, for each works contract to ensure that the disposal of C&D materials is properly documented and verified. <u>On-site Sorting of C&D Materials</u> • Storage areas would be located within the site during construction phase for temporary storage of inert C&D materials. • All C&D materials arising from the construction would be sorted on-site to recover the inert C&D materials and reusable and recyclable materials prior to disposal off-site. Non-inert portion of C&D materials should also be reused whenever possible and be disposed of at landfills as a last resort.	Minimize waste impacts from C&D materials handling	Contractor	All construction sites	Construction phase	• WDO • ETWB TCW No. 19/2005 • Land (Miscellaneous Provisions) Ordinance

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		• The Contractor would be responsible for devising a system to work for on-site sorting of C&D materials and promptly remove all sorted and processed material arising from the construction activities to minimise temporary stocking on-site. • It is recommended that the system should include the identification of the source of generation, estimated quantity, arrangement for on-site sorting and/ or collection, temporary storage areas, and frequency of collection by recycling Contractors or frequency of removal off-site.					
S10.2.2.4	WM5	<u>Reuse of C&D Materials</u> • Reuse suitable excavated rock by reworking at approved quarries (e.g. crushed as aggregates); • Sorting of demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (e.g. soil, broken concrete, metal); and • Protect recyclable material to keep it in usable condition.	Minimize waste impacts from C&D materials handling	Contractor	All construction sites	Construction phase	• WDO • ETWB TCW No. 19/2005 • Land (Miscellaneous Provisions) Ordinance
S10.2.2.4	WM6	<u>Specification of Inert C&D Materials to be Delivered Off-site</u> In case there are surplus inert C&D materials generated in the Project and are required to delivered to the Public Fill Reception Facilities (PFRFs), the inert C&D materials should fulfil the following requirements: • Reclaimed asphalt pavement will not be mixed with other materials when delivered to the public fill reception facilities;	Reduce waste generation	Contractor	All construction sites	Construction phase	• WDO • ETWB TCW No. 19/2005 • Land (Miscellaneous Provisions) Ordinance

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		• Moisture content of inert C&D materials will be lowered to 25% max. when delivered to the public fill reception facilities; • Inert C&D materials delivered to the public fill reception facilities should be a size less than 250mm; and • Inert construction waste shall not be in liquid form such that it can be contained and delivered by dump truck as far as possible. Inert C&D materials in liquid form shall be solidified before delivering to the public fill reception facilities.					
S10.2.2.5	WM7	<u>Chemical Waste</u> • For those processes which generate chemical waste, it may be possible to find alternatives to eliminate the use of chemicals, to reduce the generation quantities or to select a chemical type of less impact on environment, health and safety as far as possible. Wherever possible, opportunities for the reuse and recycling of materials will be taken. • If chemical waste is produced at the construction site, the Contractors should register with EPD as chemical waste producers and follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Chemical waste should be stored in appropriate containers and collected by a licensed chemical waste collector. Chemical waste (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre (CWTC), or another licensed facility, in accordance	Control the chemical waste and ensure proper storage, handling and disposal	Contractor	All construction sites	Construction phase	• Waste Disposal (Chemical Waste) (General) Regulation • Code of Practice on the Packaging, Labelling and Storage of Chemical Waste

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		with the Waste Disposal (Chemical Waste) (General) Regulation. • Any unused chemicals or those with remaining functional capacity should be collected for reuse as far as practicable.					
S10.2.2.6	WM8	<u>General Refuse</u> • General refuse should be stored in enclosed bins separately from construction and chemical wastes. • Recycling bins should also be placed to encourage recycling. • Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to keep areas clean. • A reputable waste collector should be employed to remove general refuse on a regular basis. • Arrangements should be made with the recycling companies to collect the recycle waste as required. It is expected that such arrangements would minimize potential environmental impacts. • The Contractor should implement an education programme for workers relating to avoiding, reducing, reusing and recycling general waste. Participation in a local collection scheme should be considered by the Contractor to facilitate waste reduction.	Minimise production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction phase	• WDO

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
Waste Management (Operational Phase)							
S10.3.2.1	WM9	General Refuse • Recycling of waste paper, aluminium cans and plastic bottles should be encouraged. • It is recommended to place clearly labelled recycling bins at designated locations which could be accessed conveniently. • General refuse should be separated from chemical waste by providing separated bins for storage to maximize the recyclable volume as far as practicable. • A reputable waste collector should be employed to remove general refuse regularly to minimize odour, pest and litter impacts. • Arrangements should be made with the recycling companies to collect the recycle waste as required.	Remove municipal solid waste generated	MTR Corporation	Kwu Tung Station as well as associated facilities	Operational phase	• WDO
S10.3.2.2	WM10	Chemical Waste • Subject to operational needs, if chemical waste is to be produced, the Project Proponent shall register with EPD as chemical waste producers as appropriate in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. Chemical waste should be collected and disposed of at appropriate facility like CWTC by licensed collectors. • The requirements given in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes should be followed, where applicable, in handling of these chemical wastes. The	Minimize production of chemical waste	MTR Corporation	All construction site	Operational phase	• WDO • Code of Practice on the Packaging, Labelling and Storage of Chemical Waste

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		requirements for the collection and disposal of chemical waste as stipulated in the Waste Disposal (Chemical Waste) (General) Regulation should be followed to monitor all movements of chemical wastes which will be collected by a licensed collector to a licensed facility for final treatment and disposal. • Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. • Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidising, irritant, toxic, harmful, corrosive, etc. • Non-recyclable chemical waste (e.g. spent lubricant oil) should be disposed of at appropriate facility like CWTC by licensed collectors. Recyclable chemical waste (e.g. used fluorescent tubes) should be collected and transported off-site by licensed collectors.					
Cultural Heritage (Construction Phase)							
S12.3.1.2	CH1	AMO should be informed immediately in case of discovery of antiquities or supposed antiquities in the course of the project works in accordance with the Antiquities and Monuments Ordinance (Cap. 53), so that appropriate mitigation measures, if needed, can be timely formulated and implemented in agreement with AMO.	To timely formulate and implement appropriate mitigation measures for protection of archaeological remains if needed within all construction sites	Contractor/ MTR Corporation	All construction sites	Construction phase	• Antiquities and Monuments Ordinance (Cap. 53)

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
S12.4	CH2	If there are any buildings / structures both at grade level and underground which were built on or before 1969 within the works sites/ works areas during the construction, the Project Proponent will alert AMO in an early stage or once identified.	To timely formulate and implement appropriate mitigation measures for protection of archaeological remains if needed within all construction sites	Contractor/ MTR Corporation	All construction sites	Construction phase	• Antiquities and Monuments Ordinance (Cap. 53)
Landscape and Visual (Construction Phase)							
S13.6.1	LV1	<u>Decorative Site Hoarding</u> Decorative site hoardings with aesthetic designs could be provided at the construction sites such that the construction site could be compatible with the surroundings and mitigate the visual impact.	Compatible with the surroundings and mitigate the visual impact.	Contractor	All construction sites	Construction Phase	• EIAO-TM
Landscape and Visual (Operational Phase)							
S13.6.2.2	LV2	<u>Compensatory Tree Planting</u> On-site and off-site tree compensation methods are being considered. The Project Proponent is still exploring the possible locations including the new development area at KTN NDA, LCSD park etc. of tree compensation and would continue to liaise with different government departments such as CEDD, LCSD, LandsD and AFCD etc. on the details for tree compensation. The following potential locations for	Compensate for trees due to the Project	Contractor/ MTR Corporation	Onsite where possible. Otherwise consider off-site locations	Detailed design and operational phase	• EIAO-TM • DEVB TCW No. 4/2020

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		tree compensation were identified and the actual locations are subject to further liaison with relevant parties: • Town Plaza in KTN NDA; • LCSD sitting-out areas, parks, roadside tree pits and landscape areas in North District; • Hillside in the North District for whip tree planting; and Any other locations to be agreed with government departments.					
S13.6.2.1	LV3	<u>Screen Planting/ Vertical Greening</u> Screen planting/ vertical greening could effectively constitute a fascinating landscape and blend the building with the surrounding greenery.	Improve compatibility with the surrounding environment	Contractor/ MTR Corporation	All structures as feasible, final location to be confirmed at detailed design phase	Detailed design and operational phase	EIAO-TM
S13.7.2	LV4	<u>Architectural Aesthetic Design of Built Structure</u> The design objectives are as follows: • To minimise the visual impact within a densely populated residential area by creating a simple and elegant design; • To create a lean building massing, maximise the at grade green landscaping area to locals and minimise the visual impact; and • To introduce biophilic orientated design as far as practicable. It is aimed to integrate the above-ground structures to the future landscape design by others and contributes to the immediate surroundings, such as	Improve visual amenity of the built structure	Contractor/ MTR Corporation	All structures as feasible, final location to be confirmed at detailed design phase	Detailed design and operational phase	EIAO-TM

ERR Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Phase	Requirements and / or standards to be achieved
		green roofing, green wall, green fifth elevation design and environmentally sustainable architecture.					
EM&A Project							
S14.3.1.4	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A performance	MTR Corporation	All construction sites	Construction Phase	• EIAO Guidance Note No.4/2010 • EIAO-TM
S14.3.1.3	EM2	• An Environmental Team needs to be employed as per the EM&A Manual. • An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring and auditing	Contractor/ MTR Corporation	All construction sites	Construction Phase	• EIAO Guidance Note No.4/2010 • EIAO-TM

Appendix 5.2

Sample Data Sheet for TSP Monitoring

Data Sheet for TSP Monitoring

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
Field Operator :			
Laboratory Staff :			
Checked by :			

Appendix 5.3

Photos of Alternative Construction Dust and Noise Monitoring Stations

Appendix 5.3 Photos of Alternative Construction Dust Monitoring Station

Construction Dust Monitoring Station ID [1]	Description	Photo
CD1a	Village Houses along Ma Tso Lung Road	
CD2a	Village Houses near Shek Tsai Leng	
CD3a	Village Houses along Ho Sheung Heung Road	

Construction Dust Monitoring Station ID [1]	Description	Photo
CD4a	Construction site office of Advance Site Formation and Engineering Infrastructure Works at Kwu Tung North and Fanling North New Development Areas – Contract No. ND/2019/01	
CD5a	Dills Corner Garden	

Note:
[1] CD: Construction dust monitoring station.

Appendix 5.3 Photos of Construction Noise Monitoring Station

Construction Noise Monitoring Station ID [1] (Proposed in ERR) and Photo	Construction Noise Monitoring Station ID [1] (Alternative) and Photo
CN1 – Multi Welfare Service Complex 	CN1a – Dills Corner Garden 

Note:
[1] CN: Noise monitoring station.

Appendix 6.1

Sample Data Sheet for
Construction Noise Monitoring

Noise Monitoring Field Record Sheet

Monitoring Location		
Description of Location		
Date of Monitoring		
Measurement Start Time (hh:mm)		
Measurement Time Length(min.)		
Noise Meter Model/Identification		
Calibrator Model/Identification		
Measurement Results	L_{90} (dB(A))	
	L_{10} (dB(A))	
	Leq (dB(A))	
Major Construction Noise Source(s) During Monitoring		
Other Noise Source(s) During Monitoring		
Remarks		

Name & Designation Signature Date

Recorded By :

Checked By :

Appendix 13.1

Sample Template for Interim Notification

Sample Template for Interim Notifications of Environmental Quality Limits Exceedances

Incident Report on Action Level or Limit Level Non-compliance

Project	
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	

Location Plan

Prepared by :

Designation :

Signature :

Date :