

MTR Corporation Limited

**SCL - NEX/2206 EIA Study for
Stabling Sidings at Hung Hom
Freight Yard**

**Environmental Monitoring
and Audit Manual**

25445

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1 Introduction

1.1 Background

The Shatin to Central Link (SCL) is one of the ten large-scale infrastructure projects announced by the Chief Executive in his 2007-2008 Policy Address. MTR Corporation Limited has been entrusted to plan and design for this project.

For the purposes of the Environmental Impact Assessment (EIA), five EIA Studies, namely Tai Wai to Hung Hom Section (SCL (TAW-HUH)), Mong Kok East to Hung Hom Section (SCL (MKK-HUH)), Hung Hom to Admiralty Section (SCL (HUH-ADM)), Protection Works at Causeway Bay Typhoon Shelter and Stabling Sidings at Hung Hom Freight Yard (HHS), have been conducted to cover different sections of the SCL. They include:

- SCL – Tai Wai to Hung Hom Section [SCL (TAW-HUH)] – the extension of Ma On Shan Line from Tai Wai Station via Hin Keng, Diamond Hill, Kai Tak, To Kwa Wan, Ma Tau Wai and Ho Man Tin to Hung Hom, and link up with the existing West Rail Line, along with a proposed stabling sidings option in Diamond Hill (DHS);
- SCL – Stabling Sidings at Hung Hom Freight Yard [SCL (HHS)] (hereinafter referred to as “the Project”, being considered in this EIA) – another stabling sidings option for SCL (TAW – HUH) proposed at the former freight terminal in Hung Hom;
- SCL – Mong Kok East to Hung Hom Section [SCL (MKK-HUH)] – the realignment work for the existing East Rail Line tracks from the tunnel portal near Oi Man Estate (Portal 1A) to the proposed North Ventilation Building (NOV) in Hung Hom;
- SCL – Hung Hom to Admiralty Section [SCL (HUH-ADM)] – the section from NOV, Plant Rooms and Emergency Access in Hung Hom across the harbour to the Causeway Bay Typhoon Shelter (CBTS), Exhibition Station (EXH) and then to ADM; and
- SCL Protection works at Causeway Bay Typhoon Shelter – the section of approximately 160m long of the SCL tunnel protection works at the crossing over Central-Wan Chai Bypass (CWB) tunnels, which would be constructed under the CWB project.

An application (No. ESB-191/2008) for an EIA Study Brief under Section 5(1)(a) of the EIAO was submitted by MTR Corporation in June 2008 with a project profile (No. PP-356/2008). A Study Brief was issued by EPD in July 2008 to provide the scope and requirements of the EIA study for SCL (TAW-HUH). In that Study Brief, the rail alignment of the SCL (TAW-HUH), 7 stations, namely Hin Keng Station (HIK), Diamond Hill Station (DIH), Kai Tak Station (KAT), To Kwa Wan Station (TKW), Ma Tau Wai Station (MTW), Ho Man Tin Station (HOM) and Hung Hom Station (HUH), along with other supporting facilities and the proposed stabling sidings in Diamond Hill (DHS) were covered.

Following the cessation of the operations of various freight facilities at Hung Hom in April 2011, MTR Corporation Limited has started a detailed study to investigate the feasibility and environmental acceptability of utilizing the former freight yard to accommodate the train stabling requirements for SCL (TAW-HUH).

To make the former Hung Hom Freight Yard feasible for the use of stabling, in addition to providing siding tracks underneath the existing podium structure covering the freight yard, and launching/retrieval and emergency tracks and shunt neck extending outside the podium, it would be necessary to make appropriate changes to the design of SCL (TAW-HUH) and SCL (MKK-HUH) at HUH, KAT and DIH and its associated alignment and facilities. These works are collectively referred to as the Project in this EIA (**Figure 1.1**).

1.2 Purposes of the Manual

The purposes of this Environmental Monitoring and Audit (EM&A) Manual are to:

- Guide the set up of an EM&A programme to ensure compliance with the EIA recommendations;
- Specify the requirements for monitoring equipment;
- Propose environmental monitoring points, monitoring frequency etc.;
- Propose Action and Limit Level; and
- Propose Event and Action Plan.

This EM&A Manual has been prepared in accordance with the requirements stipulated in Annex 21 of the Technical Memorandum on the EIA Process (TM-EIAO). This Manual outlines the monitoring and audit programme for the construction and operation of the Project and provides systematic procedures for monitoring, auditing and minimising environmental impacts.

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 organisation 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.

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 including those updates noted in the EIA.

For the purpose of this manual, the ER shall refer to the Engineer as defined in the Construction Contract, in cases where the Engineer's powers have been delegated to the ER, in accordance with the Construction Contract. The ET leader, who shall be responsible for and in charge of the ET, shall refer to the person delegated the role of executing the environmental monitoring and audit requirements.

2 Project Description

2.1 General

The HHS will be located underneath the existing podium structure covering the former Hung Hom Freight Yard at Hung Hom, except its shunt neck, launching/ retrieval and emergency tracks which will extend outside the podium as they connect to the tracks to be constructed for the SCL (TAW to HUH) section. It is also necessary to make appropriate changes in the design of Hung Hom, Kai Tak and Diamond Hill Stations and its associated alignment and facilities proposed in SCL (TAW-HUH) and SCL (MKK-HUH) EIA Reports to suit this operational arrangement. This chapter presents the key design elements of the Project. The indicative location of the Project is shown in **Figure 1.1**.

2.2 Summary of Design

A summary of the general design of the key elements of the Project is given in **Table 2.1** below:

Table 2.1: Summary of Key Elements of SCL (HHS)

Key Elements	Location	Key Works Required
Stabling Sidings	HHS	<ul style="list-style-type: none"> Construction of a train stabling sidings under the existing deck of Hung Hom Station Construction of a fan area to the north of the train stabling sidings Construction of tracks to the north and south of the stabling sidings to enable manoeuvring of trains to and from the stabling to the SCL (TAW-HUH) alignment Construction of noise mitigation over the fan area and near the shunt neck.
Stations and its associated alignment and facilities	HUH Modification	<ul style="list-style-type: none"> Construction of underground platforms Modification work of HUH podium Construction of plant rooms underneath HUH podium Construction of ventilation shafts/plant and CLP transformer plant Others such as utility diversion
	KAT	<ul style="list-style-type: none"> Construction of Kai Tak Station and associated tunnels Construction of underground refuge sidings of about 300m in length as part of the Kai Tak Station construction
	DIH	<ul style="list-style-type: none"> Construction of the interchange station with existing Kwun Tong Line at Diamond Hill Site formation to connect station to adjacent existing ground. Construction of SCL (TAW-HUH) tunnel section approaching to Diamond Hill Station to suit the DIH location without DHS. Others such as utility diversion in Diamond Hill CDA site arising from the deletion of DHS

2.3 Implementation Programme

According to the latest programme, the construction works for the Project would commence in 2012 with completion in 2018.

Detailed assessments have been conducted and presented in the EIA Report. Mitigation measures have also been identified and recommended. The Environmental Mitigation

Implementation Schedule (EMIS) is given in **Appendix A**. It specifies the extent, locations, time frame and responsibilities for the implementation of the environmental mitigation measures identified.

2.4 Concurrent Projects

The possible potential concurrent projects in the vicinity of the Project are identified as follows. **Figure 2.1** shows the location and alignment of these concurrent projects.

- Shatin to Central Link – Tai Wai to Hung Hom Section;
- Shatin to Central Link – Mong Kok East to Hung Hom Section;
- Shatin to Central Link – Hung Hom to Admiralty Section;
- Shatin to Central Link – Protection Works at Causeway Bay Typhoon Shelter;
- Central Kowloon Route;
- Widening of Gascoigne Road;
- Kai Tak Development;
- Kwun Tong Line Extension & Associated EPIW;
- HKPU Student Hostel (Phase 3) Development at Ex-Valley Road Site;
- Ex-San Po Kong Flatted Factory;
- Tsz Wan Shan Pedestrian Link;
- Covered Walkway at Kai Tak;
- Comprehensive Development (CDA) at Diamond Hill; and
- Proposed 132kV Cable Circuits Connecting with Ho Man Tin KCRC Substation and Tsim Sha Tsui Substation (Hung Hom Side).

The potential impacts of concurrent projects during the construction and operation of the proposed Project are summarised in **Table 2.2**.

Table 2.2: Summary of Potential Concurrent Projects

Project (Construction Methodology ^[2])	Potential Cumulative Impacts	
	Construction Phase ^[1]	Operational Phase ^[1]
SCL (TAW-HUH) (Bored tunnel, at grade works and cut-&-cover tunnel)	<ul style="list-style-type: none"> • Fugitive dust • Airborne noise • Ecology • Landscape and visual 	<ul style="list-style-type: none"> • Airborne noise • Landscape and visual
SCL (MKK-HUH) (cut-&-cover tunnel)	<ul style="list-style-type: none"> • Fugitive dust • Airborne noise • Landscape and visual 	<ul style="list-style-type: none"> • Airborne noise • Landscape and visual
SCL (HUH-ADM) (Land-based construction activities)	<ul style="list-style-type: none"> • Fugitive dust • Airborne noise • Ecology • Landscape and visual 	<ul style="list-style-type: none"> • Airborne noise • Landscape and visual
Protection Works at Causeway Bay Typhoon Shelter	<ul style="list-style-type: none"> • Nil 	<ul style="list-style-type: none"> • Nil

Project (Construction Methodology ^[2])	Potential Cumulative Impacts	
	Construction Phase ^[1]	Operational Phase ^[1]
Central Kowloon Route	<ul style="list-style-type: none"> • Fugitive dust • Airborne noise • Water quality • Visual 	<ul style="list-style-type: none"> • Visual
Widening of Gascoigne Road	<ul style="list-style-type: none"> • Not concurrent 	<ul style="list-style-type: none"> • Nil
Kai Tak Development (Package A, B and C)	<ul style="list-style-type: none"> • Fugitive dust • Airborne noise • Visual 	<ul style="list-style-type: none"> • Visual
Housing Authority Development Sites 1A & 1B within Kai Tak Development (superstructure construction)	<ul style="list-style-type: none"> • Fugitive dust • Airborne Noise • Visual 	<ul style="list-style-type: none"> • Visual
Kai Tak River (Nullah modification and landscape works)	<ul style="list-style-type: none"> • Fugitive dust • Visual 	<ul style="list-style-type: none"> • Visual
Multi-Purpose Stadium Complex within Kai Tak Development (construction method to be established by respective proponent)	<ul style="list-style-type: none"> • Fugitive dust 	<ul style="list-style-type: none"> • Nil
District Cooling System within Kai Tak Development (No dredging required, pumping station is underground and away from noise and air receivers for the Project, only minor construction works required for the pipework).	<ul style="list-style-type: none"> • Nil 	<ul style="list-style-type: none"> • Nil
Trunk Road T2 within Kai Tak Development (at-grade and tunnelling work, but far away from noise and air receivers for the Project)	<ul style="list-style-type: none"> • Nil 	<ul style="list-style-type: none"> • Nil
Cruise Terminal within Kai Tak Development (concurrent dredging with that for the project, but far away from noise and air receivers for the Project)	<ul style="list-style-type: none"> • Nil 	<ul style="list-style-type: none"> • Nil
Other Infrastructure within Kai Tak Development	<ul style="list-style-type: none"> • Fugitive dust • Airborne Noise • Visual 	<ul style="list-style-type: none"> • Visual
Commercial Facilities Development Above Kai Tak Station	<ul style="list-style-type: none"> • Not concurrent 	<ul style="list-style-type: none"> • Visual
Kwun Tong Line Extension & Associated EPIW (cut-&-cover station and tunnel)	<ul style="list-style-type: none"> • Fugitive dust • Airborne noise 	<ul style="list-style-type: none"> • Groundborne noise
HKPU Student Hostel (Phase 3) Development at Ex-Valley Road Site (typical superstructure construction)	<ul style="list-style-type: none"> • Fugitive dust • Visual 	<ul style="list-style-type: none"> • Visual

Project (Construction Methodology ^[2])	Potential Cumulative Impacts	
	Construction Phase ^[1]	Operational Phase ^[1]
Ex-San Po Kong Flatted factory (typical superstructure construction)	<ul style="list-style-type: none"> • Fugitive dust • Visual 	<ul style="list-style-type: none"> • Visual
Tsz Wan Shan Pedestrian Link (typical at-grade works for lift and walkway systems)	<ul style="list-style-type: none"> • Fugitive dust • Airborne noise • Visual 	<ul style="list-style-type: none"> • Visual
Covered Walkway at Kai Tak (typical walkway construction)	<ul style="list-style-type: none"> • No status 	<ul style="list-style-type: none"> • No status
Comprehensive Development Area (CDA) at Diamond Hill	<ul style="list-style-type: none"> • Not concurrent 	<ul style="list-style-type: none"> • Noise • Landscape and Visual
Proposed 132kV Cable Circuits Connecting with Ho Man Tin KCRC Substation and Tsim Sha Tsui Substation (Hung Hom Side)	<ul style="list-style-type: none"> • Nil 	<ul style="list-style-type: none"> • Nil

Note: [1] Construction phase of the Project

[2] For the section near scope of the Project

3 Project Organisation

3.1 Project Organisation

The roles and responsibilities of the various parties involved in the EM&A process and the organisational structure of the organisations responsible for implementing the EM&A programme are outlined below. The proposed project organisation and lines of communication with respect to environmental protection works are shown in **Appendix B**.

Engineer or Engineer's Representative (ER)

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

- Supervise the Contractor's activities and ensure that the requirements in the 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 inspection undertaken by the Environmental Team (ET); and
- Adhere to the procedures for carrying out complaint investigation.

The Contractor

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

- Implement the EIA recommendations and requirements;
- Provide assistance to the ET in carrying out relevant environmental monitoring;
- 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 environmental impacts where Action and Limit levels are exceeded until the events are resolved; and
- Adhere to the procedures for carrying out complaint investigation in accordance with Section 14 of this manual.

Environmental Team (ET)

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.

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:

- Monitor the various environmental parameters as required in the EM&A Manual;
- Carry out site inspections to investigate and audit the Contractor's site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and anticipate environmental issues for proactive and practicable action before problems arise;

- Analyse the EM&A data, review the success of EM&A programme to confirm the adequacy of mitigation measures implemented and the validity of the EIA predictions, and to identify any adverse environmental impacts arising and report EM&A results to the IEC and the ER;
- Adhere to the procedures for carrying out complaint investigation in accordance with Section 14 of this Manual;
- Liaison with Independent Environmental Checker (IEC) on all environmental performance matters, and timely submission of all relevant EM&A proforma for IEC's approval;
- Review the proposals of mitigation measure from the Contractor in the case of exceedances of Action and Limit levels, in accordance with the Event and Action Plans;
- Prepare reports on the environmental monitoring data and the site environmental conditions; and
- Timely submission of the EM&A report to the Director of Environmental Protection.

Independent Environmental Checker (IEC)

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

- Review and audit in an independent, objective and professional manner in all aspects of the EM&A programme;
- Validate and confirm the accuracy of monitoring results, monitoring equipment, monitoring locations, monitoring procedures and locations of sensitive receivers;
- Carry out random sample check and audit on monitoring data and sampling procedures, etc;
- Conduct random site inspection;
- Audit the EIA recommendations and requirements against the status of implementation of environmental protection measures on site;
- Review the effectiveness of environmental mitigation measures and project environmental performance;
- On as-needed basis, verify and certify the environmental acceptability of the Environmental Permit (EP) holder's construction methodology (both temporary and permanent works), relevant design plans and submissions under the EP;
- 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 or the EP holder according to Event and Action Plans in the EM&A manual.

4 Cultural Heritage

4.1 Introduction

A cultural and heritage impact assessment for the Project has been conducted according to the EIA Study Brief. The assessment has considered both the construction and operational phases of the project.

The assessment has recommended some mitigation measures for both the archaeological sites and some of the historical buildings where impacts would be envisaged.

4.2 Mitigation Measures

All the proposed mitigation measures are presented below and summarised in the EMIS in **Appendix A**.

4.2.1 Archaeological Sites

Previous studies at the former Tai Hom Village Site reveal that the Tang/ Song Dynasty remains found are both sparse and redeposited and hence of lesser archaeological significance. However, assemblage of Tang/ Song archaeological finds within urban setting is considered rare in Hong Kong. It is therefore recommended that a survey-cum-excavation works to be conducted prior to the construction works at the former Tai Hom Village site. The tentative extent for the survey-cum-excavation within former Tai Hom Village is shown in **Figure 4.1**. Before the excavation, the archaeologist shall conduct further test pits to refine the actual demarcation of the excavation area. The locations and total numbers of these test pits would need to be determined by the archaeologist and agreed with AMO on-site during the survey-cum-excavation.

An Archaeological Action Plan (AAP) following the Guideline for Archaeological Impact Assessment should be submitted to the Antiquities and Monuments Office (AMO) for agreement. The project proponent should appoint qualified and experienced archaeologist(s) with sufficient funding, time and personnel arrangements to implement the AAP. The AAP should include a detailed plan for the survey-cum-excavation and a contingency plan to address possible arrangement if significant archaeological findings are unearthed during the survey-cum-excavation. Details of the proposal plan with specification for the survey-cum-excavation should be agreed with AMO prior to the submission of licence application.

4.2.2 Built Heritages

The Former Royal Air Force Hangar and the Old Pillbox would be directly affected by the construction of the DIH. However, the Stone House No.4 would not be directly affected. As detailed photographic and cartographic records will be recommended to document the Royal Aircraft Hangar and the Old Pillbox prior to their removal, no other mitigation measure is required during the operational phase of the SCL (HHS). The Old Pillbox would be reinstated as far as practicable after being temporarily stored during the construction period. Portions of the hangar frame would also be stored during construction and placed in areas of the CDA site during operational stage to illustrate the structural technology used during war time. A model to represent the current form of the hangar will also be prepared to demonstrate the form and function of the hangar. The project proponent shall submit a separate Conservation Plan for these 2 historical buildings.

5 Ecology

5.1 Introduction

The EIA Report has assessed the ecological impacts during construction and operational phases. Mitigation measures have been recommended to ensure compliance of relevant legislative requirements. The mitigation measures and ecological monitoring and audit are given in the sections below.

5.2 Mitigation Measures

5.2.1 Habitat Loss

Some plantation areas would be lost to the construction of DIH. However, this habitat is considered to be of low ecological value and no significant ecological impacts associated with habitat loss would be anticipated. As such, no specific ecological mitigation measures are considered necessary. All the above-ground works sites at HHS, HUH and KAT would be located either on previously developed land or are extensions to existing structures and are considered of low ecological value and no significant ecological impacts would be anticipated. Nevertheless, good site practices will be implemented to further minimise the ecological impacts (see **Appendix A**).

5.2.2 Tree Felling

There will still be a certain amount of tree felling required for the construction of DIH, and to a less extent for the construction of HUH and KAT. Tree compensation will be made according to ETWB TCW No. 3/2006 as far as practicable and will be further addressed with relevant government departments and discussed in a later stage. The location of reception sites for the remaining trees shall be finalized after the agreement and approval from the relevant government department in the later stage.

5.2.3 Others

Other mitigation measures are summarised in the EMIS in **Appendix A**.

5.3 Audit Requirements

To check that the recommended mitigation measures are properly implemented, weekly site audits should be conducted by the ET during construction phase of the Project.

6 Landscape & Visual Impact

6.1 Introduction

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

6.2 Mitigation Measures

The proposed mitigation measures of landscape and visual impacts are summarised in the EMIS in **Appendix A**. The landscape and visual mitigation measures proposed should be incorporated in the detailed landscape and engineering design. The construction phase mitigation measures should be adopted from the commencement of construction and should be in place throughout the entire construction period. Mitigation measures for the operational phase should be adopted during the detailed design and be built as part of the construction works so that they are in place on commissioning of the Project.

6.3 Audit Requirement

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

In the event of non-compliance, the responsibilities of the relevant parties are detailed in the Event/Action plan provided in **Table 6.1**.

Table 6.1 Event / Action Plan for Landscape and Visual during Construction Stage

Action Level	ET	IEC	ER	Contractor
Non-conformity on one occasion	<ol style="list-style-type: none"> 1. Inform the Contractor, the IEC and the ER 2. Discuss remedial actions with the IEC, the ER and the Contractor 3. Monitor remedial actions until rectification has been completed 	<ol style="list-style-type: none"> 1. Check inspection report 2. Check the Contractor's working method 3. Discuss with the ET, ER and the Contractor on possible remedial measures 4. Advise the ER on effectiveness of proposed remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of non-conformity in writing 2. Review and agree on the remedial measures proposed by the Contractor 3. Supervise implementation of remedial measures 	<ol style="list-style-type: none"> 1. Identify Source and investigate the non-conformity 2. Implement remedial measures 3. Amend working methods agreed with the ER as appropriate 4. Rectify damage and undertake any necessary replacement
Repeated Non-conformity	<ol style="list-style-type: none"> 1. Identify source 2. Inform the Contractor, the IEC and the ER 3. Increase inspection frequency 4. Discuss remedial actions with the IEC, the ER and the Contractor 5. Monitor remedial actions until rectification has been completed 6. If non-conformity stops, cease additional monitoring 	<ol style="list-style-type: none"> 1. Check inspection report 2. Check the Contractor's working method 3. Discuss with the ET and the Contractor on possible remedial measures 4. Advise the ER on effectiveness of proposed remedial measures 	<ol style="list-style-type: none"> 1. Notify the Contractor 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. 	<ol style="list-style-type: none"> 1. Identify Source and investigate the non-conformity 2. Implement remedial measures 3. Amend working methods agreed with the ER as appropriate 4. Rectify damage and undertake any necessary replacement. Stop relevant portion of works as determined by the ER until the non-conformity is abated.

Note:

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

7 Air Quality

7.1 Introduction

The EIA has considered the potential air quality impacts during both the construction and operational phases of the Project. Fugitive dust would be the key impacts during the construction phase during which excavation, material handling etc would need to be conducted. Impacts during operational phases are unlikely due to the use of electric train system.

7.2 Mitigation Measures

All the proposed mitigation measures for controlling fugitive dust during the construction phase are summarised in the EMIS in **Appendix A**. These mitigation measures include the following:

- Mitigation measures in form of regular watering under a good site practice should be adopted. In accordance with the "Control of Open Fugitive Dust Sources" (USEPA AP-42), watering once per hour on exposed worksites and haul road is proposed; and
- Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading.

7.3 Air Quality Parameters

The levels of total suspended particulate (TSP) should be measured by following the standard method as set out in the High Volume Method for Total Suspended Particulates, Part 50 Chapter 1 Appendix B, Title 40 of the Code of Federal Regulations of the USEPA (the HVS method) or by direct reading methods which are capable of producing comparable results as that by the high volume sampling method.

Dust laden in air should be drawn through a high volume sampler (HVS) fitted with a conditioned, pre-weighed filter paper, at a controlled rate. After sampling for 24-hours, the filter paper with the retained dust particles should be collected and returned to the laboratory for drying in a desiccator followed by weighing. The 24-hour average TSP levels should be calculated from the ratio of the mass of particulates retained on the filter paper to the total volume of air sampled.

All relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper, and any other local atmospheric factors affecting or affected by site conditions, etc., shall be recorded down in detail. A sample data sheet is shown in **Appendix C**.

7.4 Monitoring Equipment

High volume samplers (HVSs) complying with the following specifications shall be used for carrying out the 1-hour and 24-hour TSP monitoring:

- a) 0.6 - 1.7 m³ per minute adjustable flow range;
- b) equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operation;
- c) installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation;
- d) capable of providing a minimum exposed area of 406 cm²;
- e) flow control accuracy: +/- 2.5% deviation over 24-hour sampling period;
- f) equipped with a shelter to protect the filter and sampler;

- g) incorporated with an electronic mass flow rate controller or other equivalent devices;
- h) equipped with a flow recorder for continuous monitoring;
- i) provided with a peaked roof inlet;
- j) incorporated with a manometer;
- k) able to hold and seal the filter paper to the sampler housing at horizontal position;
- l) easily changeable filter; and
- m) capable of operating continuously for a 24-hour period.

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.

Initial calibration of dust monitoring equipment shall be conducted upon installation and thereafter in every six months. The transfer standard shall be traceable to the internationally recognised primary standard and be calibrated annually. The concern parties such as IEC shall properly document the calibration data for future reference. All the data should be converted into standard temperature and pressure condition.

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 mentioned in **Appendix C**.

If the ET Leader proposes to use a direct reading dust meter to measure TSP levels, he shall submit sufficient information to the IEC to prove that the instrument is capable of achieving a comparable result as that the HVS and can be used for sampling. The instrument shall be calibrated regularly following the requirements specified by the equipment manufacturers.

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.

7.5 Laboratory Measurement / Analysis

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 should be HOKLAS accredited.

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 approved by the ER and the measurement procedures shall be audited by the IEC. Any measurement performed by the laboratory shall be demonstrated to the satisfaction of the ER and IEC. IEC shall regularly audit 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 the Code of Federal Regulations, Chapter 1 (Part 50), for his reference.

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.

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.

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

7.6 Monitoring Locations

The locations of the proposed construction dust monitoring stations are summarised in **Table 7.1** and shown in **Figures 7.1.1 to 7.1.3**. The status and locations of sensitive receivers may change after issuing this manual. If such cases exist, the ET shall propose updated monitoring locations based on criteria below and seek approval from ER and agreement from the IEC and EPD.

Table 7.1 Proposed Construction Dust Monitoring Locations

ID	ASR ID in EIA	Location
DMS-1	HUH-10-1	Harbourfront Horizon ^[1]
DMS-2	HUH-1-3	Wing Fung Building ^[2]
DMS-3	DIH-14-5	Block 1, Rhythm Garden ^[2]
DMS-4	DIH-9-1	Shek On House ^[2]

Note:

[1] – Dust monitoring will be carried out under SCL (MKK-HUH)

[2] – Same monitoring location under SCL (TAW-HUH)

When alternative monitoring locations are proposed, the proposed site should, as far as practicable:

- a) be at the site boundary or such locations close to the major dust emission source;
- b) be close to the sensitive receptors; and
- c) take into account the prevailing meteorological conditions.

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 samplers, the following points shall be noted:

- a) a horizontal platform with appropriate support to secure the samplers against gusty wind should be provided;
- b) no two samplers should be placed less than 2 m apart;
- c) 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;
- d) a minimum of 2 m of separation from walls, parapets and penthouses is required for rooftop samplers;
- e) a minimum of 2 m separation from any supporting structure, measured horizontally is required;
- f) no furnace or incinerator flue is nearby;
- g) airflow around the sampler is unrestricted;
- h) the sampler is more than 20 m from the dripline;
- i) any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring;
- j) permission must be obtained to set up the samplers and to obtain access to the monitoring stations; and
- k) a secured supply of electricity is needed to operate the samplers.

7.7 Baseline Monitoring

Baseline monitoring shall be carried out at all of the designated monitoring locations (see **Table 7.1**) for at least 14 consecutive days prior to the commissioning of major construction works to obtain 1-hour and 24-hour TSP samples. General meteorological conditions (wind speed, direction and precipitation) and notes regarding any significant adjacent dust producing sources shall also be recorded throughout the baseline monitoring period. The selected baseline monitoring stations should reflect baseline conditions at the impact stations. 1-hour TSP sampling should also be done at least 3 times per day.

During the baseline monitoring, there should not be any major construction or dust generation activities in the vicinity of the monitoring stations. Before commencing baseline monitoring, the ET shall inform the IEC of the baseline monitoring programme such that, if required, the IEC can conduct on-site audit to ensure accuracy of the baseline monitoring results.

In case the baseline monitoring cannot be carried out at the designated monitoring locations, the ET shall propose and carry out the monitoring at alternative locations that can effectively represent the baseline conditions at the impact monitoring locations. The alternative baseline monitoring locations shall be approved by the ER and agreed with the IEC.

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

If the ET 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.

A summary of the requirements for the baseline dust monitoring is shown in **Table 7.2**.

Table 7.2 Summary of Baseline Dust Monitoring Programme

Monitoring Period	Duration	Parameter	Frequency
Baseline Monitoring	14 consecutive days prior to commencement of major construction works	1-hour TSP	3 times per day
		Continuous 24-hour TSP	Daily

7.8 Impact Monitoring

The ET shall carry out impact monitoring during the entire construction period. For 24-hour TSP impact monitoring, the sampling frequency shall be at least once in every 6 days at each of the monitoring station. 1-hour TSP monitoring shall be conducted when one documented valid complaint is received. The sampling frequency of 1-hour TSP monitoring shall be at least 3 times in every 6 days when the highest dust impacts are likely to occur. Before commencing impact monitoring, the ET shall inform the IEC of the impact monitoring programme such that the IEC can conduct on-site audit to ensure accuracy of the monitoring results.

The specific time to start and stop the 24-hour TSP monitoring shall be clearly defined for each location and be strictly followed by the ET.

In case of non-compliance with the air quality criteria, more frequent monitoring, as specified in the Action Plan in the following section, shall be conducted within the specified timeframe after the result is obtained. This additional monitoring shall be continued until the excessive dust emission or the deterioration in air quality is rectified, and agreed with the ER and the IEC.

A summary of the requirements for the dust impact monitoring is shown in **Table 7.3**.

Table 7.3 Summary of Construction Dust Monitoring Programme

Monitoring Period	Duration	Parameter	Frequency
Impact Monitoring	Throughout the construction period ^[1]	24-hour TSP ^[2]	Once per 6 days

Note:

[1] 1- hour TSP shall be conducted when one documented valid complaint is received.

[2] 24-hour TSP shall be conducted when project-related construction activities are being undertaken within a radius of 500m from monitoring stations.

7.9 Action / Limit Levels

The baseline monitoring results form the basis for determining the air quality criteria for the impact monitoring. The ET shall compare the impact monitoring results with air quality criteria set up for 24-hour TSP and 1-hour TSP. **Table 7.4** shows the air quality criteria, namely Action and Limit levels to be used.

Table 7.4 Action / Limit Levels for Air Quality

Parameters	Action	Limit
24-hour TSP Level in $\mu\text{g m}^{-3}$	For baseline level $\leq 200 \mu\text{g m}^{-3}$, Action level = (baseline level * 1.3 + Limit level)/2; For baseline level $> 200 \mu\text{g m}^{-3}$ Action level = Limit level	260 $\mu\text{g/m}^3$
1-hour TSP Level in $\mu\text{g m}^{-3}$	For baseline level $\leq 384 \mu\text{g m}^{-3}$, Action level = (baseline level * 1.3 + Limit level)/2; For baseline level $> 384 \mu\text{g m}^{-3}$, Action level = Limit level	500 $\mu\text{g/m}^3$

7.10 Event and Action Plan

Should non-compliance of the air quality criteria occur, actions in accordance with the Action Plan in **Table 7.5** shall be carried out.

Table 7.5 Event and Action Plan for Air Quality

Event	Action			
	ET	IEC	ER	Contractor
Action Level				
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Inform the IEC, Contractor and ER; 2. Discuss with the Contractor, IEC and ER on the remedial measures required; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET; 2. Check Contractor's working method; 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 	<ol style="list-style-type: none"> 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.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Inform the IEC, Contractor and ER; 2. Discuss with the ER, IEC and Contractor on the remedial measures required; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. If exceedance continues, arrange meeting with the IEC, ER and Contractor; 6. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET; 2. Check Contractor's working method; 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify the Contractor, IEC and ET; 3. Review and agree on the remedial measures proposed by the Contractor; 4. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Identify source and investigate the causes of exceedance; 2. Submit proposals for remedial measures to the ER with a copy to ET and IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal as appropriate.

Event	Action			
	ET	IEC	ER	Contractor
Limit Level				
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Inform the IEC, Contractor and ER; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency to daily; 4. Discuss with the ER, IEC and contractor on the remedial measures and assess the effectiveness. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ET, ER and Contractor on possible remedial measures; 4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify the Contractor, IEC and ET; 3. Review and agree on the remedial measures proposed by the Contractor; 4. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to ER with a copy to ET and IEC within three working days of notification; 4. Implement the agreed proposals; 5. Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Notify IEC, Contractor and EPD; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency to daily; 4. Carry out analysis of the Contractor's working procedures with the ER to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC, Contractor and ER to discuss the remedial measures to be taken; 6. Review the effectiveness of the Contractor's remedial measures and keep IEC, EPD and ER informed of the results; 7. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with ET, ER, and Contractor on the potential remedial measures; 4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify the Contractor, IEC and ET; 3. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 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. 	<ol style="list-style-type: none"> 1. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with a copy to the IEC and ET within three working days of notification; 4. Implement the agreed proposals; 5. Revise 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.

8 Airborne Noise

8.1 Introduction

The EIA has considered the potential airborne noise impacts during both the construction and operational phases of the Project. Construction noise from mechanical equipment would be the key impacts during the construction phases during which excavation, material handling etc would need to be conducted. Trains running on viaduct and embankment sections would also affect the neighbouring sensitive receivers.

8.2 Mitigation Measures

8.2.1 Construction Phase

All the proposed mitigation measures for controlling airborne construction noise and operational noise are summarised in the EMIS in **Appendix A**. These mitigation measures include the following:

- Use of good site practices to limit noise emissions;
- Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs;
- Install movable noise barriers, acoustic mat or full enclosure, screen the noisy plants including air compressor, generators, saw;
- Select “Quiet plants” which comply with the BS 5228 Part 1 or TM standards;
- Sequencing operation of construction plants where practicable;
- Implement a noise monitoring under EM&A programme;
- Louvres should be orientated away from adjacent NSRs, preferably onto main roads which are less sensitive;
- Direct noise mitigation measures including silencers, acoustic louvers and acoustic enclosures should be allowed for in the design for the ventilation building, stations and stabling sidings; and
- The facade for these plant areas / ventilation shafts should have adequate sound insulation properties to minimise the noise emanating through the building fabric.

8.2.2 Operational Phase

The following mitigation measures have to be proposed to minimise the noise impacts due to the operation of HHS on the nearby NSRs:

- 7m high semi-enclosure extending from the edge of the podium to the realigned Cheong Wan Road (P1) Bridge with a structural separation to allow independent movement between the two structures;
- Approximately 35m long of noise barrier at a height of 5m from Cheong Wan Road towards north (P2)¹; and
- Approximately 45m long of noise barrier at a height of 5m from Chatham Road North towards south (P3)².

Note: Noise barrier is measured 5m relative to the track level.

The extent and location of the above mitigation measures are shown in **Figure 8.1**.

¹ Height of noise barrier is measured from the track level.

² Height of noise barrier is measured from the track level.

8.3 Noise Monitoring Parameters

Construction noise level shall be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq\ 30\ min}$ shall be used as the monitoring parameter for the time period between 0700 and 1900 hours on normal weekdays.

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

8.4 Monitoring Equipment

As referred to in 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 before and after the noise measurement agrees to within 1.0 dB.

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

The ET is responsible for the provision, installation, operation, maintenance, dismantle of the monitoring equipment. He shall ensure that sufficient noise measuring equipment and associated instrumentation are available for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. All the equipment and associated instrumentation shall be clearly labelled.

8.5 Monitoring Locations for Construction Phase

The locations of proposed construction noise monitoring stations are summarised in **Table 8.1** and shown in **Figures 8.2.1 to 8.2.3**.

Table 8.1 Proposed Construction Airborne Noise Monitoring Locations

ID	NSR ID in EIA	Location
NMS-CA-1	HUH-1-3	Wing Fung Building ^[1]
NMS-CA-2	DIH-14-4	Canossa Primary School (San Po Kong) ^[1]
NMS-CA-3	DIH-14-5	Block 1, Rhythm Garden ^[1]
NMS-CA-4	DIH-9-1	Shek On House ^[1]

Note:

[1] – Same monitoring location under SCL (TAW-HUH)

When alternative monitoring locations are proposed, the monitoring locations should be chosen based on the following criteria:

- at locations close to the major site activities which are likely to have noise impacts;
- close to the most affected existing noise sensitive receivers; and
- for monitoring locations located in the vicinity of the sensitive receivers, care should be taken to cause minimal disturbance to the occupants during monitoring.

In case the baseline monitoring cannot be carried out at the designated monitoring locations, the ET shall propose and carry out the monitoring at alternative locations that can effectively represent the baseline conditions at the impact monitoring locations. The alternative baseline monitoring locations shall be approved by the ER and agreed with the IEC and EPD.

The monitoring station shall normally be at a point 1m from the exterior of the sensitive receiver building facade and be at a position 1.2 m above local 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 facade correction of +3 dB(A) shall be made to the free field measurements. The ET shall agree with the IEC and EPD 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. If changes to the monitoring stations are required upon commencing the baseline monitoring or thereafter, the ET should propose alternative locations based on the above-mentioned criteria and seek approval from the ER and agreement from the IEC and EPD on the proposal.

8.6 Baseline Monitoring for Construction Phase

The ET shall carry out baseline noise monitoring prior to the commencement of the construction works. There shall not be any construction activities in the vicinity of the stations during the baseline monitoring. Continuous baseline noise monitoring for the A-weighted levels L_{eq} , L_{10} and L_{90} shall be carried out daily for a period of at least two weeks in a sample period of 30 minutes between 0700 and 1900 hrs and 15 minutes (as three consecutive $L_{eq,5 \text{ minutes}}$ readings) for evening time (between 1900 and 2300 hours on normal weekdays), general holidays including Sundays (between 0700 and 2300 hours) and night-time (between 2300 and 0700 on all days). Before commencing baseline monitoring, the ET shall inform the IEC of the baseline monitoring programme such that, if required, the IEC can conduct on-site audit to ensure accuracy of the baseline monitoring results.

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

8.7 Impact Monitoring for Construction Phase

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

For construction monitoring stations at schools, noise monitoring shall be carried out during the school examination periods. The ET shall liaise with the school's personnel to ascertain the exact dates and times of all examination periods during the course of the contract.

In case of non-compliance with the construction noise criteria, more frequent monitoring, as specified in the Action Plan, shall be carried out. This additional monitoring shall be continued until the recorded noise levels are rectified or proved to be irrelevant to the construction activities.

8.8 Event and Action Plan for Construction Phase

The Action and Limit levels for construction noise are defined in **Table 8.2**.

Table 8.2 Action and Limit Levels

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

Note : 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.

* Reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

To account for cases in which ambient noise levels, as identified by baseline monitoring, approach or exceed the stipulated Limit Levels prior to the commencement of construction,

a Maximum Acceptable Impact Level, which incorporates the baseline noise levels and the identified construction noise Limit Level, may be defined and agreed with the EPD. The amended level will be greater than 75 dB(A) and will represent the maximum acceptable noise level at a specific monitoring station. Correction factors for the effects of acoustic screening and/or architectural features of NSRs may also be applied as specified in the Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM).

Should non-compliance of the criteria occur, action in accordance with the Action Plan in **Table 8.3** shall be carried out.

Table 8.3 Event and Action Plan

Event	Action			
	ET	IEC	ER	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify the IEC, Contractor and ER 2. Discuss with the ER, IEC and Contractor on the remedial measures required 3. Increase monitoring frequency to check mitigation effectiveness 	<ol style="list-style-type: none"> 1. Review the investigation results submitted by the contractor; 2. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of complaint in writing 2. Notify the Contractor, IEC and ET 3. Review and agree on the remedial measures proposed by the Contractor; 4. Supervise implementation of remedial measures 	<ol style="list-style-type: none"> 1. Investigate the complaint and propose remedial measures 2. Report the results of investigation to the IEC, ET and ER 3. Submit noise mitigation proposals to the ER with copy to the IEC and ET within 3 working days of notification. 4. Implement noise mitigation proposals
Limit Level	<ol style="list-style-type: none"> 1. Notify the IEC, Contractor and EPD 2. Repeat measurement to confirm findings 3. Increase monitoring frequency 4. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented 5. Arrange meeting with the IEC, Contractor and ER to discuss the remedial measures to be taken; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances 7. Assess effectiveness of the Contractor's remedial measures and keep IEC, ER and EPD informed of the results 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ER, ET and Contractor on the potential remedial measures 4. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing 2. Notify the Contractor, IEC and ET 3. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented 4. Supervise the implementation of remedial measures 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 	<ol style="list-style-type: none"> 1. Identify source and investigate the causes of exceedance 2. Take immediate action to avoid further exceedance 3. Submit proposals for remedial measures to the ER with copy to the IEC and ET within 3 working days of notification. 4. Implement the agreed proposals 5. Revise 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

8.9 Operation Rail Noise Monitoring

Prior to the operation phase of the Project, a commissioning test will be conducted for verification of EIA predictions against the assessment goals and checking the compliance of the airborne noise levels with the NCO noise criteria.

Monitoring of $L_{eq,30min}$ train noise levels will be carried out at the proposed monitoring locations during night-time period, i.e.2300-0700 on a monthly basis after SCL (HHS) is in operation. Background noise levels shall also be measured. It is recommended to conduct the monitoring for the initial start-up of up to 6 months. With full compliance of the noise limit and agreement from IEC, monitoring can be terminated before the end of this 6-month period.

8.10 Monitoring Equipment and Methodology

The monitoring equipments and methodology for operation rail noise monitoring should be same as those recommended for construction noise monitoring.

8.11 Noise Monitoring Stations

Based on the EIA study, the potentially worst affected locations were designated for operational airborne noise monitoring as listed in **Table 8.4** and illustrated in **Figure 8.3**.

Table 8.4 Proposed Operational Airborne Noise Monitoring Stations

ID	NSR ID in EIA	Location
NMS-OA-1	HUH-1-3	Wing Fung Building ^[1]

Note:

[1] – Noise monitoring will be carried out under SCL (MKK-HUH)

The status and location of noise monitoring stations may change after approval of this Manual. In such cases, and if changes to the monitoring locations are considered necessary, the ET Leader should propose updated monitoring stations and seek agreement from the IEC and EPD on the proposal. If alternative monitoring locations are proposed, the monitoring locations should be chosen based on the following criteria:

- Monitoring at NSRs close to the major operation activities which are likely to cause train induced noise impacts;
- Monitoring as close as practicable to the NSRs as defined in the EIAO-TM and IND-TM; and
- Assurance of minimal disturbance to the occupants and working under a safe condition during monitoring.

The monitoring stations should normally be at a point 1m from the exterior of the noise sensitive facade and be at a position 1.2m above ground. If there is a problem with access to the normal monitoring position, an alternative position should be chosen, and a correction to the measurements should be made. For reference, a correction of +3dB(A) should be made to the free field measurements. The ET Leader should agree with the IEC on the monitoring position and the corrections adopted.

9 Groundborne Noise

9.1 Introduction

Prediction of construction groundborne noise indicates the criteria will be achieved and mitigation measures are not required. In order to ensure proper control of groundborne noise, a noise commissioning test should be conducted by the ET at the proposed groundborne noise monitoring stations (see **Table 9.2** below) prior to the operation of the Project to confirm the compliance of the operational groundborne noise levels with the NCO noise criteria.

9.2 Mitigation Measures

Since all the predicted groundborne noise impacts comply with the legislative requirements, no mitigation measures are required for construction and operational phases ground-borne noise. Prior to the operation phase of the Project, commissioning test will be conducted to ensure compliance of operation groundborne noise levels with the TM-EIAO relevant noise criteria.

9.3 Groundborne Noise Monitoring Parameters and Criteria

The operational groundborne noise criteria for the representative NSRs along SCL (HHS) are tabulated in **Table 9.1** below.

Table 9.1 Operational Groundborne Noise Criteria

NSR Description	ASR Rating	Groundborne Noise Criteria, $L_{Aeq\ 30mins}$		
		Day & Evening (0700 to 2300 hrs)	Night (2300 to 0700 hrs)	Criteria Employed
Domestic premises along alignment	B	55	45	45
	C	60	50	50

Notes: [1] These NSRs are considered to be noise sensitive during daytime and evening time only.

9.4 Monitoring Equipment

As referred to in 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 groundborne 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 before and after the noise measurement agrees to within 1.0 dB.

The ET is responsible for the provision, installation, operation, maintenance, dismantle of the monitoring equipment. He shall ensure that sufficient noise measuring equipment and associated instrumentation are available for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. All the equipment and associated instrumentation shall be clearly labelled.

9.5 Monitoring Locations

The proposed groundborne noise monitoring stations for commissioning test are summarised in **Table 9.2** and shown in **Figures 9.1.1 to 9.1.2**.

Table 9.2 Proposed Groundborne Noise Monitoring Stations for Commissioning Test

ID	NSR ID in EIA	Description
NMS-OG-1	HUH-1-3	Wing Fung Building ^[1]
NMS-OG-2	DIH-11-1	Lung Poon Court

Note:

[1] – Noise monitoring will be carried out under SCL (MKK-HUH)

The monitoring station shall normally be at the lowest sensitive floor of each designated monitoring location and normally be at a position 1.2 m above ground inside the building structures. The monitoring locations shall also not be significantly affected by background noise level. The exact locations for the monitoring shall be proposed by the ET and agreed with IEC and EPD.

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. 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. If changes to the monitoring stations are required upon commencing the baseline monitoring or thereafter, the ET should propose alternative locations based on the above-mentioned criteria and seek approval from the ER and agreement from the IEC and EPD on the proposal.

9.6 Baseline Monitoring

Existing $L_{eq(30min)}$ levels should be monitored at the monitoring locations without trains running to obtain the ambient noise levels. After the train noise levels are measured (if measured directly), these ambient levels should be deducted from the measured $L_{eq(30min)}$ levels to obtain the operational noise levels in the absence of ambient noise.

9.7 Impact Monitoring

A noise commissioning test should be conducted by the ET prior to the operation of the Project to confirm the compliance of the operational ground-borne noise levels with the NCO noise criteria. The noise commissioning test should be performed at proposed groundborne noise monitoring locations listed in **Table 9.2**.

10 Water Quality

10.1 Introduction

The EIA Report has assessed the water quality impacts associated with the Project. According to the EIA Report, the water quality impact could be minimized with the implementation of mitigation measures. The water quality monitoring programme as discussed below could ensure the implementation of the recommended mitigation measures and provide effective control of any malpractices.

10.2 Mitigation Measures

The EIA Report has recommended construction phase mitigation measures. All the prepared mitigation measures are summarised in the EMIS in **Appendix A**. The key mitigation measures include the following.

Construction Site Runoff / Site Drainage:

- Construction site runoff and site drainage should be mitigated in accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN 1/94).

Tunneling Works:

- Cut-&-cover/ open cut tunnelling work should be conducted sequentially to limit the amount of construction runoff generated from exposed areas during the wet season (April to September) as far as practicable.
- Uncontaminated discharge should pass through sedimentation tanks prior to off-site discharge
- The wastewater with a high concentration of SS should be treated (e.g. by sedimentation tanks with sufficient retention time) before discharge. Oil interceptors would also be required to remove the oil, lubricants and grease from the wastewater.
- Direct discharge of the bentonite slurry (as a result of D-wall and bored tunnelling construction) is not allowed. It should be reconditioned and reused wherever practicable. Temporary storage locations (typically a properly closed warehouse) should be provided on site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.

Construction Sewage Effluent:

- Adequate numbers of portable toilets should be provided for handling the construction sewage generated by the workforce. The portable toilets should be maintained in a reasonable state, which will not deter the workers from utilizing these portable toilets. Overnight sewerage should be collected by licensed collectors regularly.

10.3 Audit Requirements

To check that the recommended mitigation measures are properly implemented, weekly site audits should be conducted by the ET during construction phase of the Project.

10.4 Monitoring Requirements

Given that no adverse water quality impact would be anticipated, water quality monitoring is not required for the Project.

11 Waste Management

11.1 Introduction

The quantity and timing for the generation of waste during the construction phase have been estimated. Measures including the opportunity for on-site sorting, reusing excavated materials etc, are devised in the construction methodology to minimise the surplus materials to be disposed off-site. Proper disposal of chemical waste should be via a licensed waste collector. All the proposed mitigation measures are stipulated in the EIA Report and summarised in the EMIS in **Appendix A**.

The types and quantities of waste that would be generated during the operational phase have been assessed. It is anticipated there would not be any insurmountable impacts during the operational phase. A trip-ticket system should be operated to monitor all movements of chemical wastes which will be collected by a licensed collector to a licensed facility for final treatment and disposal. Recommendations have been made to ensure proper treatment and proper disposal of these wastes in the EIA Report and summarised in the EMIS in **Appendix A**. The mitigation measures should form the basis of the Environmental Management Plan (EMP).

EM&A requirements are 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 environmentally acceptable manner; and
- to encourage the reuse and recycling of material.

11.2 Waste EM&A Requirements

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

- Chemical Waste Permits/licenses under the Waste Disposal Ordinance (Cap 354);
- Public Dumping Licence under the Land (Miscellaneous Provisions) Ordinance (Cap 28);
- Marine Dumping Permit under the Dumping at Sea Ordinance (Cap 466); and
- Effluent Discharge Licence under the Water Pollution Control Ordinance.

The Contractor shall refer to the relevant booklets issued by the DEP when applying for the licence/permit and the ET shall refer to these booklets for auditing purposes.

Regular audits and site inspections should be carried out during construction phase by the ET to ensure that the recommended good site practices and other recommended mitigation measures 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, documents including licences, permits, disposal and recycling records should be reviewed and audited for compliance with the legislation and contract requirements.

The requirements of the environmental audit programme are set out in **Section 13** of this Manual. The audit programme will verify the implementation status and evaluate the effectiveness of the mitigation measures.

12 Land Contamination

12.1 Introduction

A land contamination assessment has been conducted for the project. Desktop study and site survey has been carried out to identify potential land contamination within the Study Area of the Project. Assessment findings revealed that no land contamination issue would be anticipated within the Project area.

12.2 Land Contamination EM&A Requirements

Given no adverse land contamination issue would be anticipated within the Project area, no specific EM&A requirement is required.

13 Site Environmental Audit

13.1 Site Inspection

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

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

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 situations 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:

- (i) EIA Report recommendations on environmental protection and pollution control mitigation measures;
- (ii) works progress and programme;
- (iii) individual works methodology proposals (which shall include the proposal on associated pollution control measures);
- (iv) contract specifications on environmental protection;
- (v) relevant environmental protection and pollution control legislations; and
- (vi) previous site inspection results.

The Contractor shall keep the ER and ET Leader updated with all 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.

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 Action Plan for the EM&A programme.

13.2 Environmental Compliance

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

In order that the works comply with 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. The Environmental Mitigation Implementation Schedule (EMIS) is summarised in **Appendix A**. 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 EIA Report.

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

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 licences / permits under the environmental protection laws, and copies of all valid licences / permits. The site diary and environmental records shall also be available for inspection by the relevant parties.

After reviewing the document, the ET shall advise the IEC and 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 may 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.

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.

13.3 Choice of Construction Method

At times during the construction phase the Contractor may submit method statements for various aspects of construction. This state of affairs would only apply to those construction methods that the EIA has not imposed conditions while for construction methods that have been assessed in the EIA, the Contractor is bound to follow the requirements and recommendations in the EIA study. The Contractor's options for alternative construction methods may introduce adverse environmental impacts into the Project. It is the responsibility of the Contractor and ET, in accordance with established standards, guidelines and EIA study recommendations and requirements, to review and determine the adequacy of the environmental protection and pollution control measures in the Contractor's proposal in order to ensure no unacceptable impacts would result. To achieve this end, the ET shall provide a copy of the Proactive Environmental Protection Proforma as shown in **Appendix E** to the IEC for approval. The IEC should audit the review of the construction method and endorse the proposal on the basis of no adverse environmental impacts.

13.4 Environmental Complaints

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

- (i) The Contractor to log complaint and date of receipt onto the complaint database and inform the ER, ET and IEC immediately;
- (ii) 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;
- (iii) 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;
- (iv) 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;

- (v) The ER, ET and IEC to review the effectiveness of the Contractor's remedial measures and the updated situation;
- (vi) The ET to undertake additional monitoring and audit to verify the situation if necessary, and oversee that circumstances leading to the complaint do not recur;
- (vii) If the complaint is referred by the EPD, the Contractor to prepare interim report on the status of the complaint investigation and follow-up actions stipulated above, including the details of the remedial measures and additional monitoring identified or already taken, for submission to EPD within the time frame assigned by the EPD; and
- (viii) The ET to record the details of the complaint, results of the investigation, subsequent actions taken to address the complaint and updated situation including the effectiveness of the remedial measures, supported by regular and additional monitoring results in the monthly EM&A reports.

14 Reporting

14.1 General

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 (baseline and impact) shall also be submitted on diskettes or other approved media. The formats for air quality, noise and water quality monitoring data to be submitted shall be separately agreed.

The ET is responsible for establishing and maintaining a dedicated website throughout the entire construction period for publishing all the relevant environmental monitoring data (including but not limited to the baseline and impact monitoring). The ET shall propose the format and functionality of the website for agreement with the ER and IEC prior to publishing of data. Once the monitoring data are available (eg noise, dust, water quality etc) and vetted by the IEC, the ET is responsible to upload the relevant data to the dedicated website.

Types of reports that the ET shall prepare and submit include baseline monitoring report, monthly EM&A report and final EM&A review report. In accordance with Annex 21 of the EIAO-TM, a copy of the monthly and final review EM&A reports shall be made available to the Director of Environmental Protection.

14.2 Baseline Monitoring Report

The ET should prepare and submit a Baseline Environmental Monitoring Report at least one month before commencement of construction of the Project. Copies of the Baseline Environmental Monitoring Report should be submitted to the IEC, ER and EPD. The ET should liaise with the relevant parties on the exact number of copies require.

The baseline monitoring report shall include at least the following:

- (i) up to half a page executive summary;
- (ii) brief project background information;
- (iii) drawings showing locations of the baseline monitoring stations;
- (iv) monitoring results (in both hard and 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;
- (v) 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;
- (vi) determination of the Action and Limit Levels for each monitoring parameter and statistical analysis of the baseline data,
- (vii) revisions for inclusion in the EM&A Manual; and
- (viii) comments, recommendations and conclusions.

14.3 Monthly EM&A Reports

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, with the first report due the month after construction commences. Copies of each monthly EM&A report shall be submitted to the following parties: the IEC, the ER and EPD. Before submission of the first EM&A report, the ET shall liaise with the parties on the required number of copies and format of the monthly reports in both hard copy and electronic medium.

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

First Monthly EM&A Report

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

- (i) Executive summary (1-2 pages):
 - breaches of Action and Limit levels;
 - complaint log;
 - notifications of any summons and successful prosecutions;
 - reporting changes; and
 - future key issues.
- (ii) Basic project information:
 - project organisation including key personnel contact names and telephone numbers;
 - programme;
 - management structure, and
 - works undertaken during the month.
- (iii) Environmental status:
 - advice on the status of statutory environmental compliance 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 and control stations (with co-ordinates of the monitoring locations).
- (iv) A brief summary of EM&A requirements including:
 - all monitoring parameters;
 - environmental quality performance limits (Action and Limit levels);
 - Event-Action Plans;
 - environmental mitigation measures, as recommended in the project EIA study final report; and
 - environmental requirements in contract documents.
- (v) Implementation status:
 - advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the project EIA.

- (vi) Monitoring results (in both hard and diskette copies) together with the following information:
- monitoring methodology;
 - name of laboratory and types of equipment used and calibration details;
 - 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.
- (vii) Report on non-compliance, complaints, and notifications of summons and successful prosecutions:
- record of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
 - record of all complaints received (written or verbal) for each media, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
 - record of all notification of summons and successful prosecutions for breaches of current environmental protection / pollution control 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.
- (viii) Others
- an account of the future key issues as reviewed from the works programme and work method statements;
 - advice on the solid and liquid waste management status;
 - record of any project changes from that originally proposed as described in the EIA (e.g. construction methods, mitigation proposals, design changes, etc); and
 - comments (for examples, effectiveness and efficiency of the mitigation measures), recommendations (for example, any improvement in the EM&A programme) and conclusions.

Subsequent EM&A Reports

Subsequent monthly EM&A reports shall include the following:

- (i) Executive summary (1 - 2 pages):
- breaches of Action and Limit levels;
 - complaints log;
 - notifications of any summons and successful prosecutions;
 - reporting changes; and
 - future key issues.
- (ii) Basic project information:
- project organisation including key personnel contact names and telephone numbers;

- programme;
 - management structure;
 - work undertaken during the month; and
 - any updates as needed to the scope of works and construction methodologies.
- (iii) Environmental status:
- advice on the status of statutory environmental compliance, 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
 - drawing showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations.
- (iv) Implementation status:
- advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the project EIA Report.
- (v) Monitoring results (in both hard and diskette copies) together with the following information:
- monitoring methodology;
 - name of laboratory and types of equipment used and calibration details;
 - monitoring parameters;
 - monitoring locations;
 - monitoring date, time, frequency, and duration;
 - weather conditions during the period;
 - any other factors which might affect the monitoring results; and
 - QA / QC results and detection limits.
- (vi) Report on non-compliance, complaints, and notifications of summons and successful prosecutions:
- record of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
 - record of all complaints received (written or verbal) for each media, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
 - record of all notification of summons and successful prosecutions for breaches of current environmental protection / pollution control 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.
- (vii) Others
- an account of the future key issues as reviewed from the works programme and work method statements;
 - advice on the solid and liquid waste management status;
 - record of any project changes from that originally proposed as described in the EIA (e.g. construction methods, mitigation proposals, design changes, etc); and

- comments (for examples, effectiveness and efficiency of the mitigation measures), recommendations (for example, any improvement in the EM&A programme) and conclusions.

(viii) 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:
 - a) major activities being carried out on site during the period;
 - b) weather conditions during the period; and
 - c) 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.

14.4 Final EM&A Review Reports

The EM&A programme should be terminated upon the completion of the construction activities that have the potential to result in significant environmental impacts.

Prior to the proposed termination, it may be advisable to consult relevant local communities. The proposed termination should only be implemented after the proposal has been endorsed by the IEC, the Engineer and the Project Proponent followed by approval from the Director of Environmental Protection.

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

- (i) Executive summary (1 - 2 pages);
- (ii) Drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control 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 measures, as recommended in the project EIA Report;
 - environmental impact hypotheses tested;
 - environmental quality performance limits (Action and Limit levels);
 - all monitoring parameters;
 - Event and Action Plans;
- (v) A summary of the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the project EIA Report, 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 post-project monitoring for all monitoring stations annotated against:
 - 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 (written or verbal) for each media, liaison and consultation undertaken, actions and follow-up procedures taken;
- (xi) A summary record of notifications of summons and successful prosecutions for breaches of the current environmental protection / pollution control legislation, locations and nature of the breaches, investigation follow-up actions taken and results;
- (xii) A review of the validity of EIA predictions and identification of shortcomings in EIA recommendations;
- (xiii) Comments (for examples, 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
- (xiv) 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).

14.5 Data Keeping

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 in magnetic media form, and the software copy must be available upon request. Data format shall be agreed with EPD. All documents and data shall be kept for at least one year following completion of the construction contract.

14.6 Interim Notifications of Environmental Quality Limit Exceedances

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 D**.

FIGURES



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 FILENAME: \$FILENAME\$
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DATE	08/11

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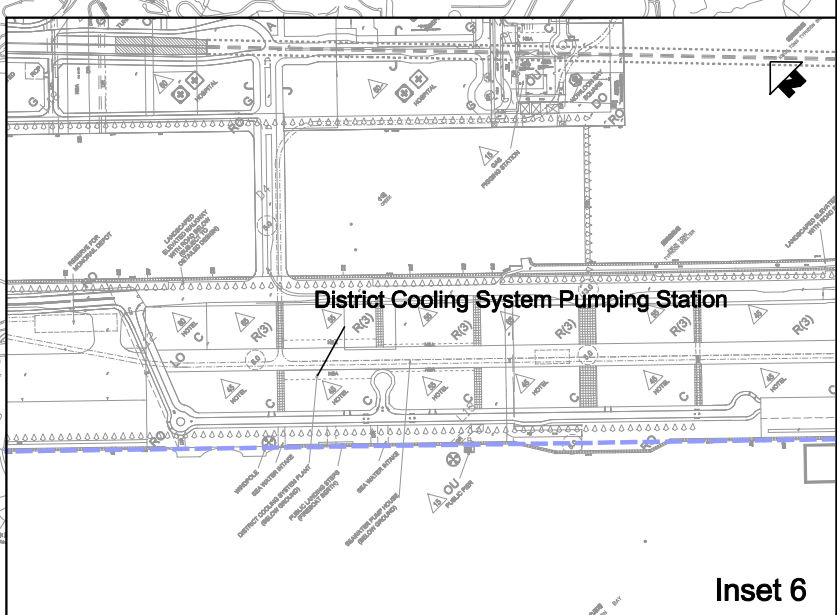
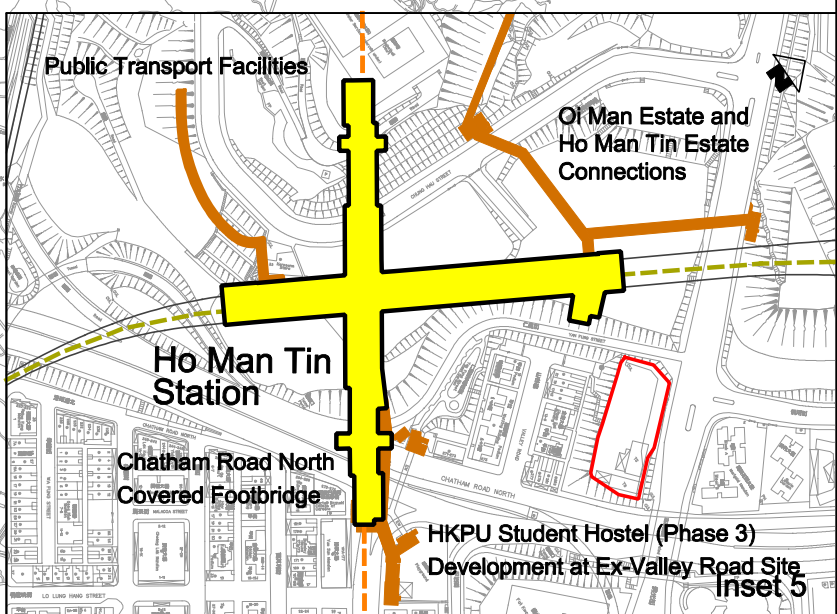
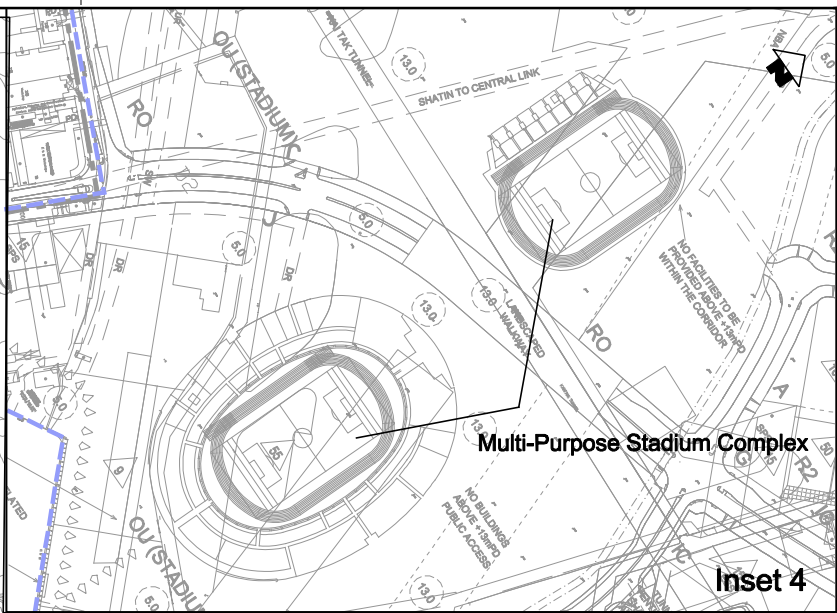
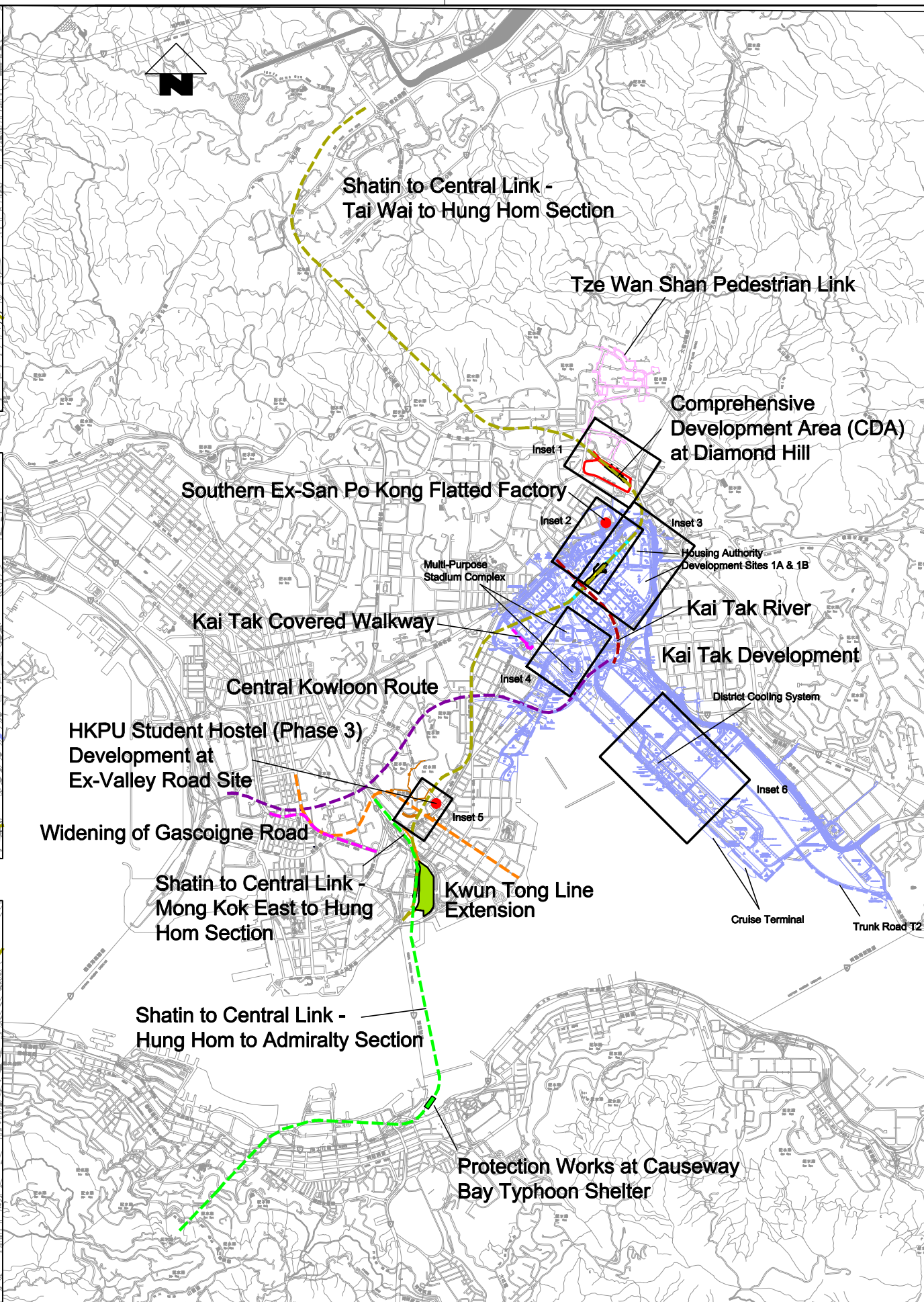
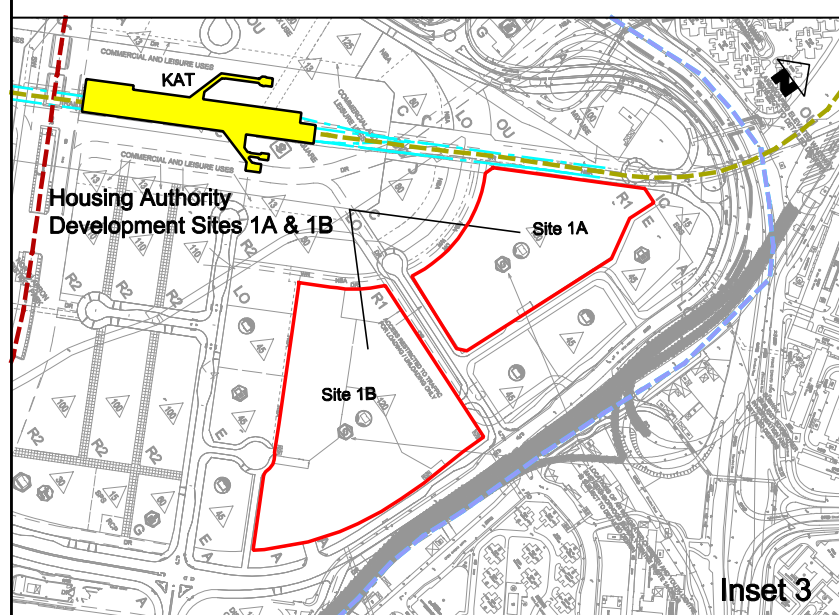
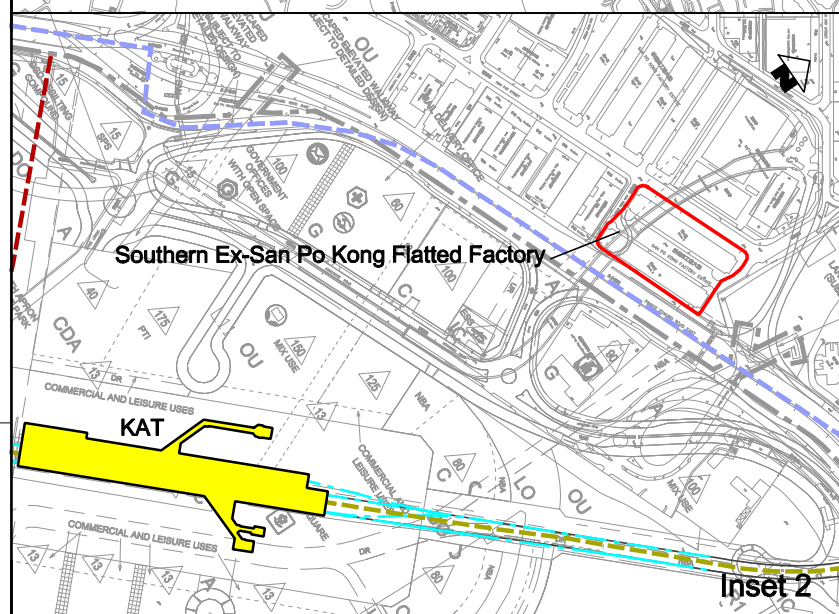
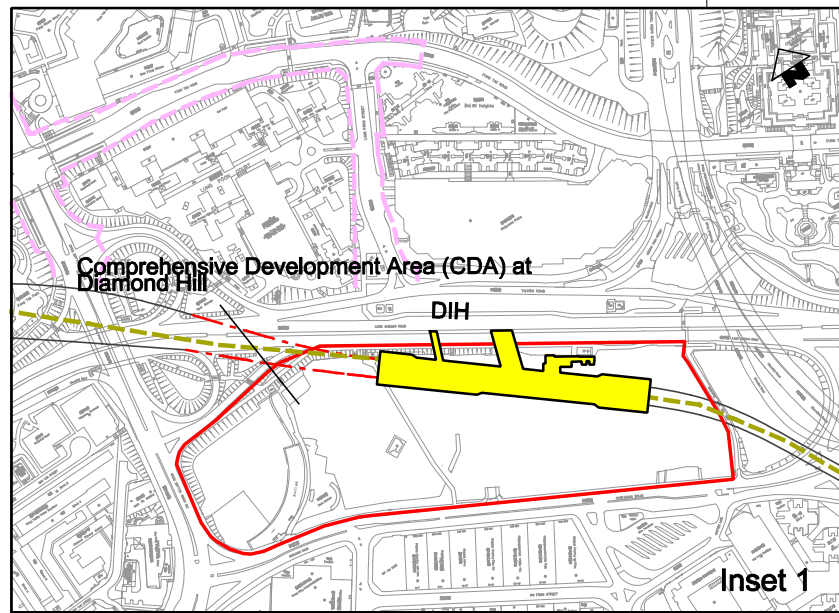
 ORIGINATOR

 Ove Arup & Partners

 Hong Kong Limited

TITLE NEX2206 - SCL (HHS) STABILING SIDINGS AT HUNG HOM FREIGHT YARD Overview of the Project	
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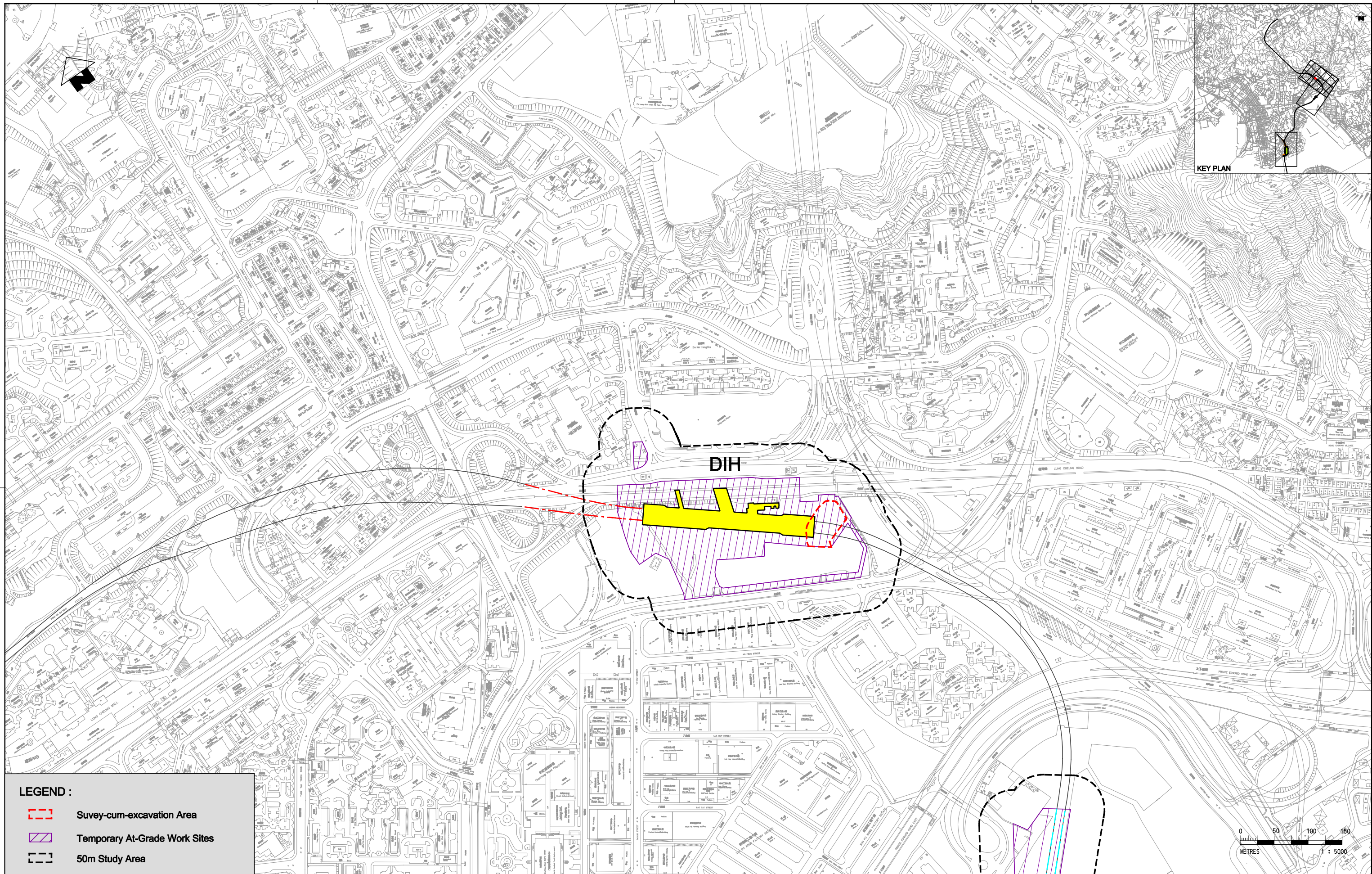
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TITLE
 NEX2206 - SCL (HHS)
 STABLING SIDINGS AT HUNG HOM FREIGHT YARD
 Locations of Concurrent Projects

SCALE 1 : 50000 (A3)
 DRAWING NO. Figure 2.1
 REV. A



- LEGEND :**
- Suvey-cum-excavation Area
 - Temporary At-Grade Work Sites
 - 50m Study Area

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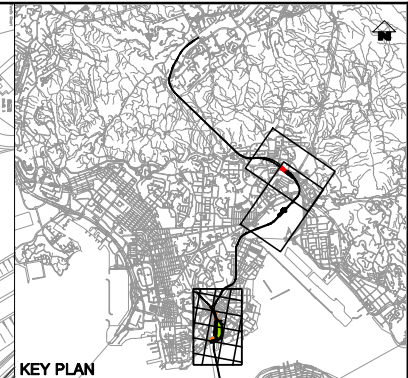
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TITLE		NEX2206 - SCL(HHS) STABLING SIDINGS AT HUNG HOM FREIGHT YARD Tentative Extent for Suvey-cum-excavation Area	
SCALE	DRAWING NO.	REV.	
1 : 5000 (A3)	Figure 4.1	A	



KEY PLAN






Edge of Podium

DMS-2

DMS-1

LEGEND :

-  Temporary At-Grade Work Sites
-  500m Study Area
-  Construction Dust Monitoring Locations



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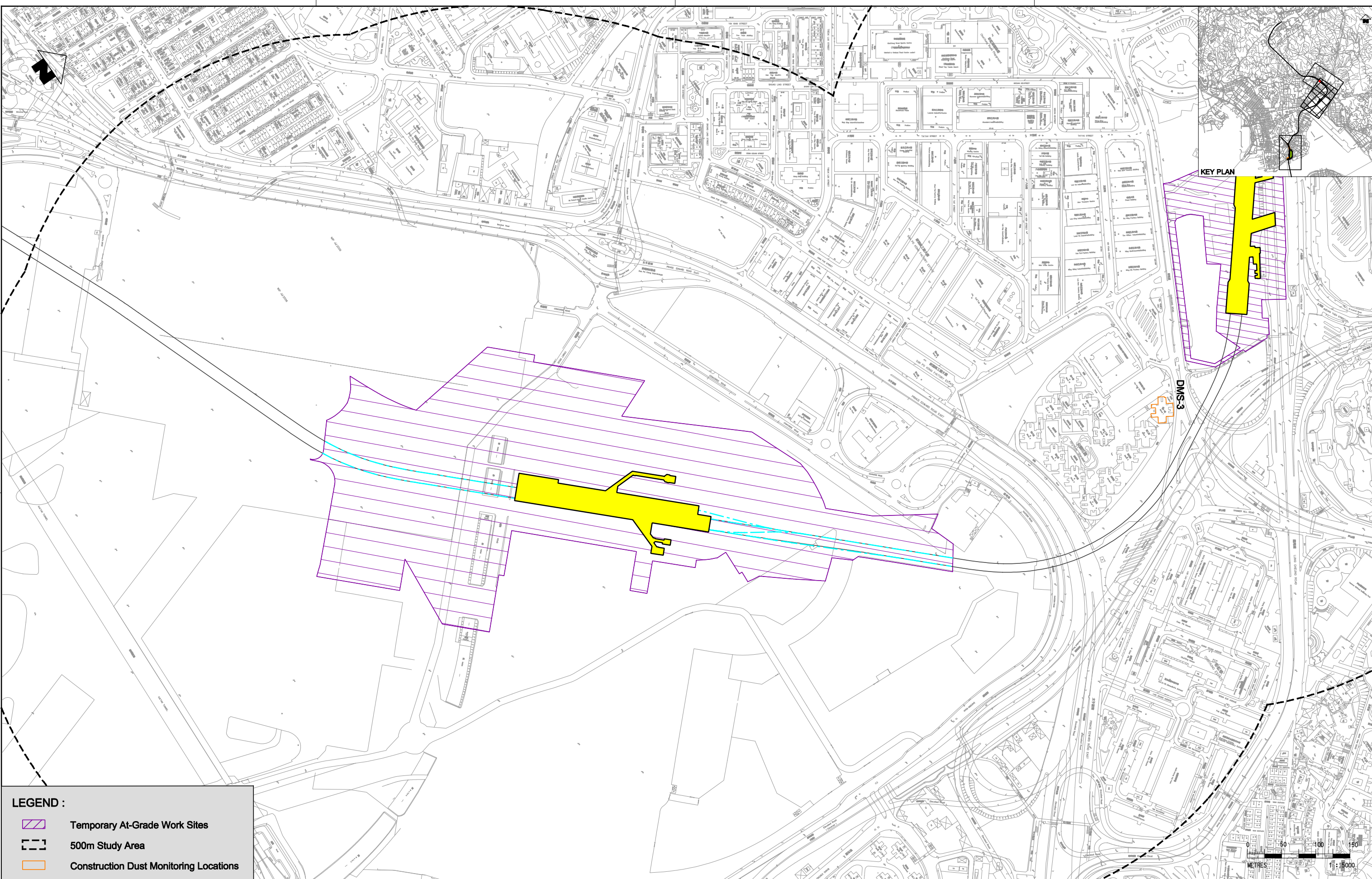
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TITLE

NEX2206 - SCL (HHS)
STABLING SIDINGS AT HUNG HOM FREIGHT YARD
Locations of Proposed Dust Monitoring Locations
(Sheet 1 of 3)

SCALE 1 : 5000 (A3) DRAWING NO. **Figure 7.1.1** REV. **A**

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LEGEND :

- Temporary At-Grade Work Sites
- 500m Study Area
- Construction Dust Monitoring Locations

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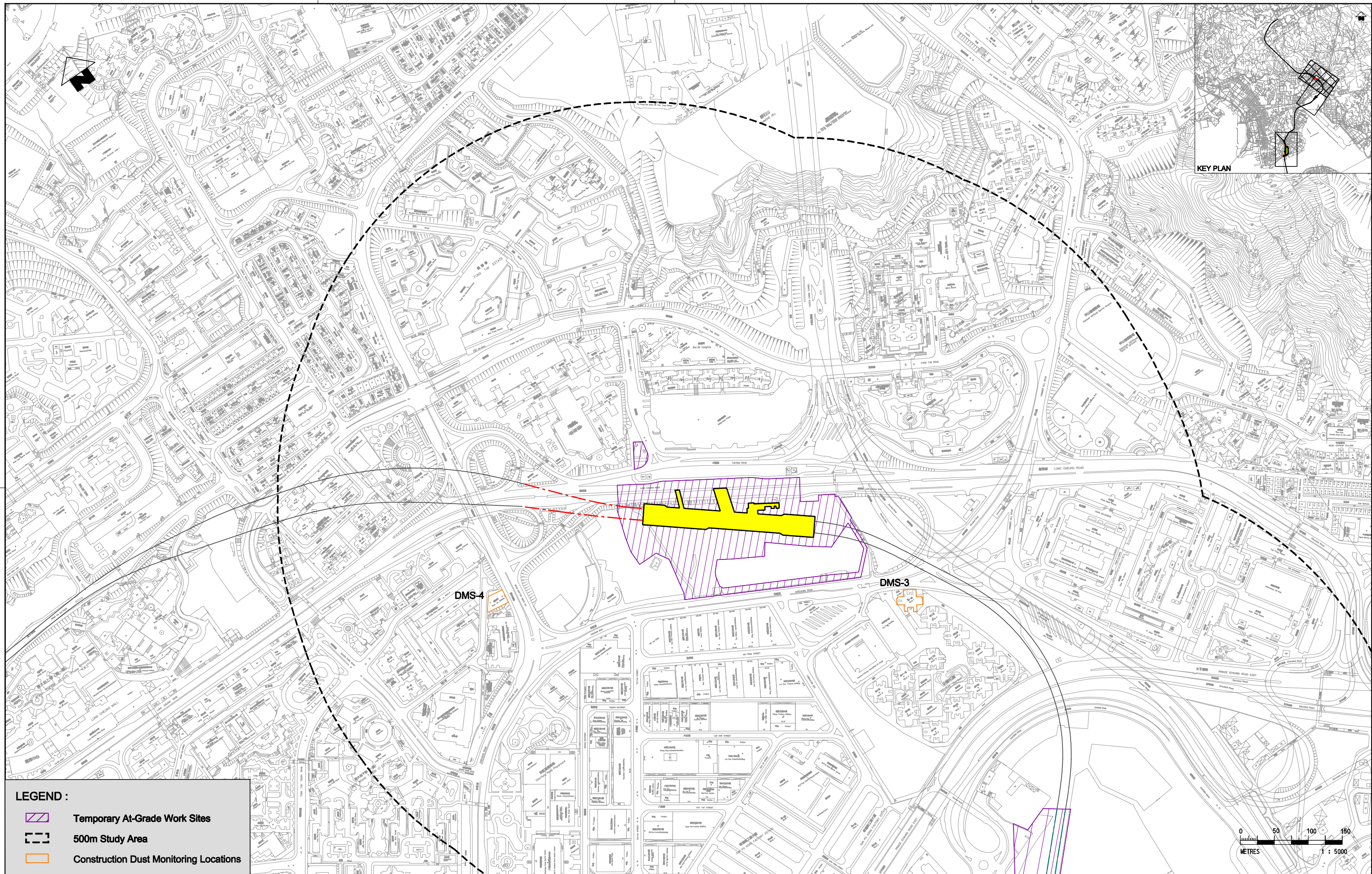
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NEX2206 - SCL (HHS)
 STABLING SIDINGS AT HUNG HOM FREIGHT YARD
 Locations of Proposed Dust Monitoring Locations
 (Sheet 2 of 3)

SCALE 1 : 5000 (A3)

DRAWING NO. Figure 7.1.2

REV. A



LEGEND :

- Temporary At-Grade Work Sites
- 500m Study Area
- Construction Dust Monitoring Locations

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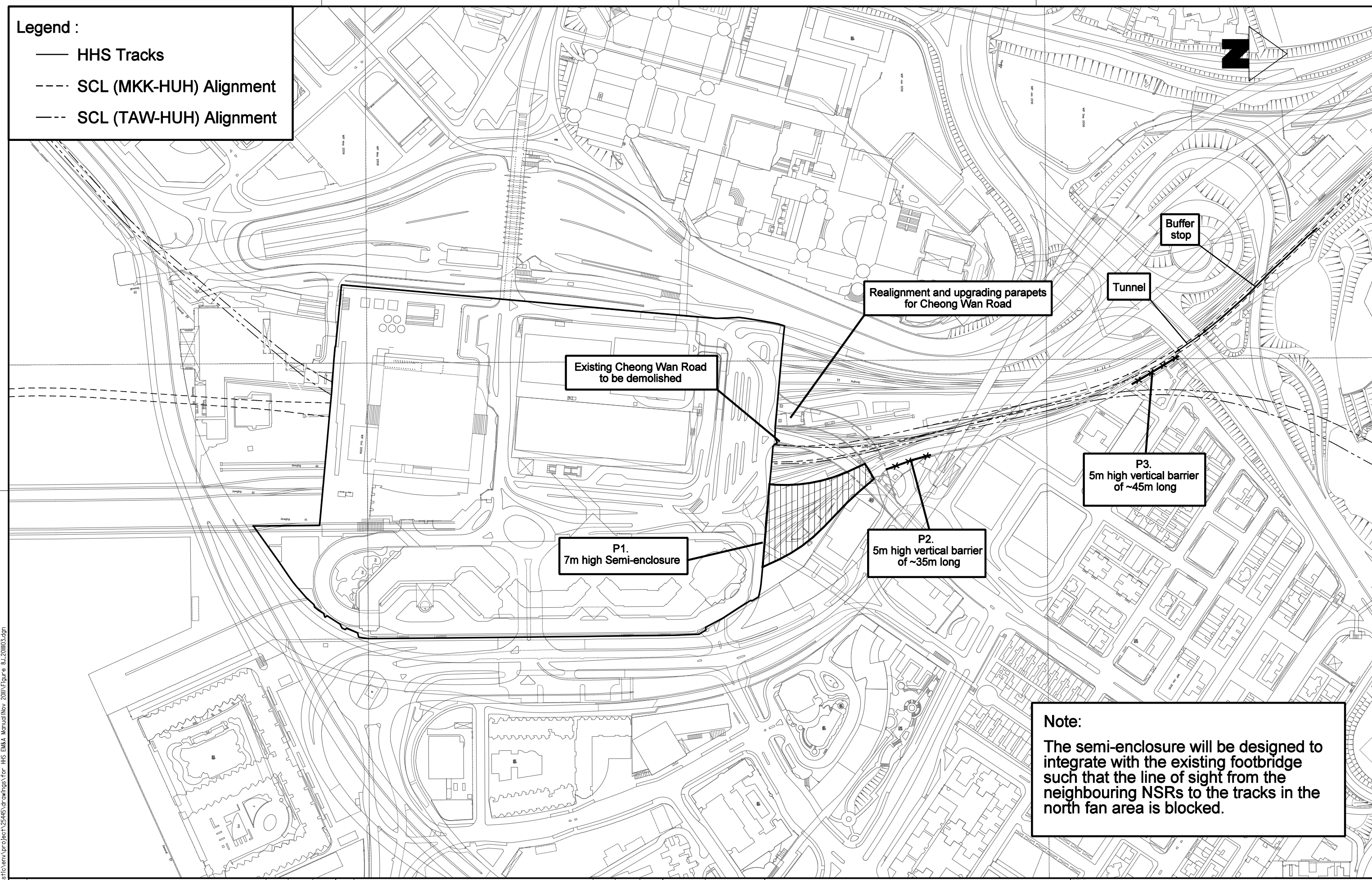
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TITLE	
NEX2206 – SCL (HHS) STABLING SIDINGS AT HUNG HOM FREIGHT YARD Locations of Proposed Dust Monitoring Locations (Sheet 3 of 3)	
SCALE	DRAWING NO.
1 : 5000 (A3)	Figure 7.1.3
REV.	A

- Legend :**
- HHS Tracks
 - - - SCL (MKK-HUH) Alignment
 - - - SCL (TAW-HUH) Alignment





Note:
 The semi-enclosure will be designed to integrate with the existing footbridge such that the line of sight from the neighbouring NSRs to the tracks in the north fan area is blocked.

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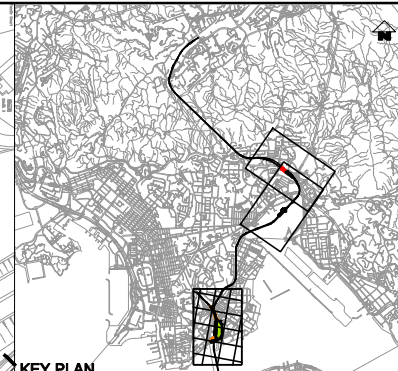


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TITLE		NEX2206 - SCL(HHS) STABLING SIDINGS AT HUNG HOM FREIGHT YARD Noise Mitigation Measures between HHS and Chatham Road North	
SCALE	DRAWING NO.	REV.	
1 : 3000 (A3)	Figure 8.1	A	



KEY PLAN



Edge of Podium

NMS-CA-1

LEGEND :

- Temporary At-Grade Work Sites
- 300m Study Area
- Construction Airborne Noise Monitoring Locations
- Assessment Point for Construction Airborne Noise Monitoring



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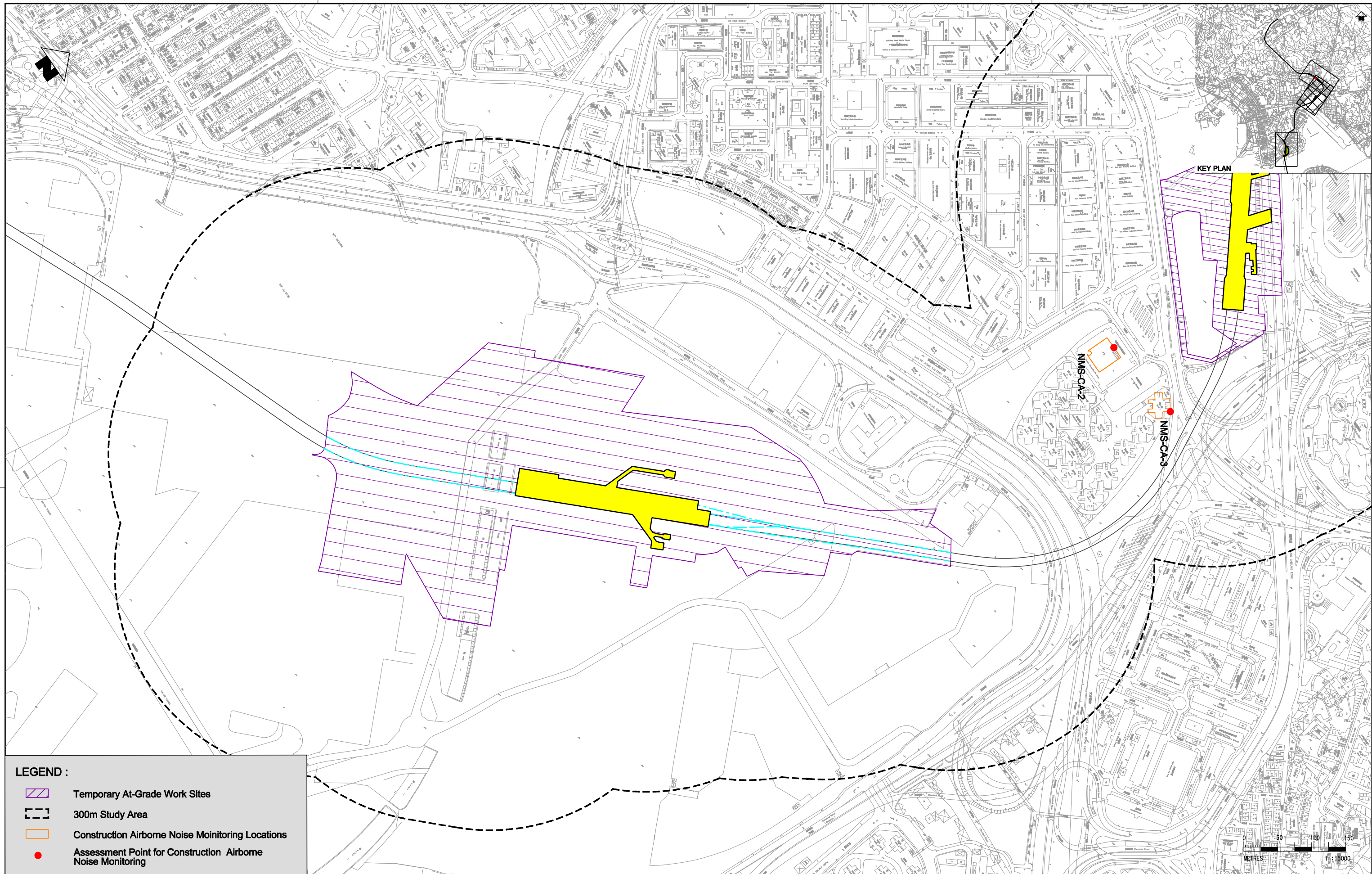
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NEX2206 - SCL (HHS)
STABLING SIDINGS AT HUNG HOM FREIGHT YARD
Locations of Proposed Noise Monitoring Stations
(Construction Airborne Noise)
(Sheet 1 of 3)





SCALE 1 : 5000 (A3)

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REV. **A**



LEGEND :

-  Temporary At-Grade Work Sites
-  300m Study Area
-  Construction Airborne Noise Monitoring Locations
-  Assessment Point for Construction Airborne Noise Monitoring

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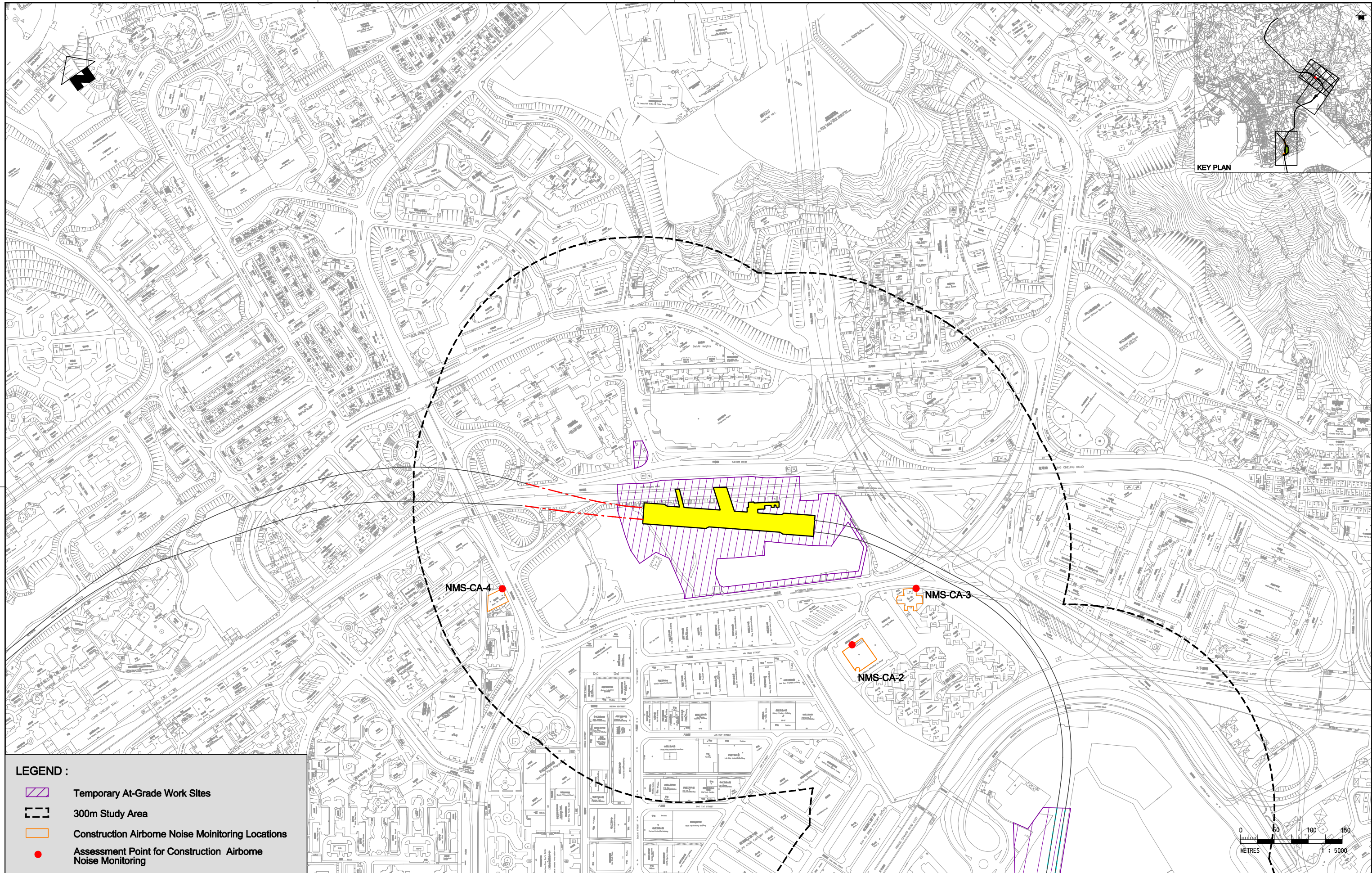
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TITLE		NEX2206 - SCL (HHS) STABLING SIDINGS AT HUNG HOM FREIGHT YARD Locations of Proposed Noise Monitoring Stations (Construction Airborne Noise) (Sheet 2 of 3)	
SCALE	DRAWING NO.	REV.	
1 : 5000 (A3)	Figure 8.2.2	A	



- LEGEND :**
- Temporary At-Grade Work Sites
 - 300m Study Area
 - Construction Airborne Noise Monitoring Locations
 - Assessment Point for Construction Airborne Noise Monitoring

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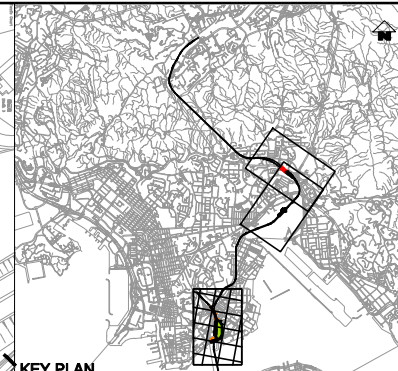
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TITLE NEX2206 - SCL(HHS) STABLING SIDINGS AT HUNG HOM FREIGHT YARD Locations of Proposed Noise Monitoring Stations (Construction Airborne Noise) (Sheet 3 of 3)		SCALE 1 : 5000 (A3)	DRAWING NO. Figure 8.2.3	REV. A
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

KEY PLAN



Edge of Podium

NMS-OA-1

LEGEND :

-  Temporary At-Grade Work Sites
-  300m Study Area
-  Operation Airborne Noise Monitoring Locations
-  Assessment Point for Operation Airborne Noise Monitoring



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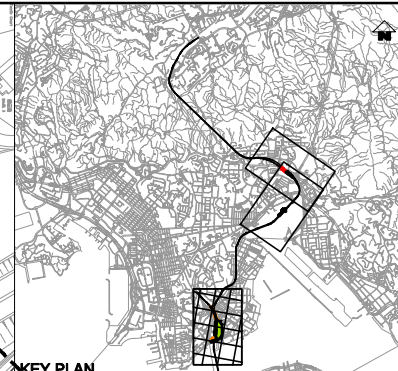
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NEX2206 - SCL (HHS)
STABLING SIDINGS AT HUNG HOM FREIGHT YARD
 Location of Proposed Noise Monitoring Stations
 (Operation Airborne Noise)

SCALE 1 : 5000 (A3) DRAWING NO. **Figure 8.3** REV. **A**






KEY PLAN



Edge of Podium

NMS-OG-1

LEGEND :

-  Temporary At-Grade Work Sites
-  300m Study Area
-  Groundborne Noise Monitoring Stations



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NEX2206 - SCL (HHS)
STABLING SIDINGS AT HUNG HOM FREIGHT YARD
Locations of Proposed Noise Monitoring Stations
(Groundborne Noise)
(Sheet 1 of 2)

SCALE 1 : 5000 (A3) DRAWING NO. **Figure 9.1.1** REV. **A**

Appendix A

Environmental Mitigation Implementation Schedule

Environmental Mitigation Implementation Schedule – SCL (HHS)

Note: Chapters 1 to 3 of the EIA report present the background information of the Project, identified concurrent projects, objectives and scope for various environmental aspects, and description on alternative options and construction description. Chapters 4 to 12 of the EIA report present the EIA findings and mitigation measures are described below with cross-reference to the EIA report. Chapters 13 & 15 describe the environmental monitoring requirements and conclusion.

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
<i>Cultural Heritage Impact (Construction and Operational Phase)</i>							
S4.8.1	CH1	Submit an Archaeological Action Plan. Survey-cum-excavation shall be conducted prior to the construction works at the former Tai Hom Village site.	Salvage cultural remains at the Former Tai Hom Village Site	Contractor	Former Tai Hom Village Site	Prior to the Construction Phase of DIH site	<ul style="list-style-type: none"> • AMO's requirements
S4.8.2	CH2	Submit a Conservation Plan for the Former Royal Air Force Hangar and the Old Pillbox to AMO for agreement.	Proposal for conservation of 2 historical buildings	Contractor	Former Tai Hom Village Site	Prior to the Construction Phase of DIH site	<ul style="list-style-type: none"> • AMO's requirements • Principles for the Conservation of Heritage Sites in China • Burra Charter, the Australia's ICOMOS Charter for Places of Cultural Significance

Environmental Mitigation Implementation Schedule – SCL (HHS)

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Ecology (Construction Phase)							
S5.7	E1	<p><u>Good Site Practices</u></p> <p>Impact to any habitats or local fauna should be avoided by implementing good site practices, including the containment of silt runoff within the site boundary, appropriate storage of chemicals and chemical waste away from sites of ecological value and the provision of sanitary facilities for on-site workers. Adoption of such measures should permit waste to be suitably contained within the site for subsequent removal and appropriate disposal.</p> <p>The following good site practices should also be implemented:</p> <ul style="list-style-type: none"> • No on-site burning of waste; • Waste and refuse in appropriate receptacles. 	Minimise ecological impacts	Contractor	All construction sites	During construction	<ul style="list-style-type: none"> • ProPECC PN 1/94

Environmental Mitigation Implementation Schedule – SCL (HHS)

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Landscape & Visual (Construction Phase)							
S6.12	LV1	<p>The following good site practices and measures for minimisation and avoidance of potential impacts are recommended:</p> <p><u>Re-use of Existing Soil</u></p> <ul style="list-style-type: none"> For soil conservation, existing topsoil shall be re-used where possible for new planting areas within the Project. The construction program shall consider using the soil removed from one phase for backfilling another. Suitable storage ground, gathering ground and mixing ground may be set up on-site as necessary. <p><u>No-intrusion Zone</u></p> <ul style="list-style-type: none"> To maximize protection to existing trees, ground vegetation and the associated under storey habitats, construction contracts may designate “No-intrusion Zone” to various areas within the site boundary with rigid and durable fencing for each individual no-intrusion zone. The contractor should closely monitor and restrict the site working staff from entering the “no-intrusion zone”, even for indirect construction activities and storage of equipment. <p><u>Protection of Retained Trees</u></p> <ul style="list-style-type: none"> All retained trees should be recorded photographically at the commencement of the Contract, and carefully protected during the construction period. Detailed tree protection specification shall be allowed and included in the Contract Specification, which specifying the tree protection requirement, submission and approval system, and the tree monitoring system. The Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, 	Minimize visual and landscape impact	Contractor	Within Project Site	Construction stage	TM-EIAO

Environmental Mitigation Implementation Schedule – SCL (HHS)

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
		including trees in contractor's works sites.					
Table 6.9	LV2	<ul style="list-style-type: none"> <u>Decorative Hoarding</u> Erection of decorative screen during construction stage to screen off undesirable views of the construction site for visual and landscape sensitive areas. Hoarding should be designed to be compatible with the existing urban context. <u>Management of facilities on work sites</u> To provide proper management of the facilities on the sites, give control on the height and disposition/ arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs. <u>Tree Transplanting</u> Trees of medium to high survival rate that would be affected by the works shall be transplanted where possible and practicable. Tree transplanting proposal including final location for transplanted trees shall be submitted separately to seek relevant government department's approval, in accordance with ETWB TCW No 3/2006. 	Minimize the visual and landscape impact of the Project during construction phase	Contractor	Within Project Site	Detailed design and construction stage	EIAO – TM ETWB TCW 2/2004 ETWB TCW 3/2006
Landscape & Visual (Operational Phase)							
Table 6.10	LV3	<ul style="list-style-type: none"> <u>Compensation Tree Planting</u> Compensatory tree planting should be provided to compensate for felled trees as far as practicable. Compensatory tree planting proposal including location of compensation shall be submitted separately to seek relevant government department's approval, in accordance with ETWB TCW 3/2006. <u>Screen Planting</u> Buffer tree planting including shrub and climber plants shall be incorporated to provide screening to ventilation 	Minimize the visual and landscape impact of the Project during operation phase	Contractor / MTR Corporation	Within Project Site	Detailed design and operation stage	EIAO – TM ETWB TCW 2/2004 ETWB TCW 3/2006

Environmental Mitigation Implementation Schedule – SCL (HHS)

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
		<p>shafts/plant, engineering structures and associated facilities.</p> <ul style="list-style-type: none"> • <u>Landscape Re-instatement</u> All hard and soft landscape areas temporarily disturbed during construction phase shall be reinstated to equal or better quality, to the satisfaction of the relevant government departments. • <u>Aesthetic landscape and architectural treatment on Station / Entrances/ Ventilation Shaft</u> All station entrances, ventilation shafts and all above ground structures shall be sensitively designed to ensure that suitable architectural design and the element with colour, texture and tonal quality being compatible to the existing urban and future urban context, which shall include tree planting where space permits, to minimize the potential adverse landscape and visual impacts. • <u>Re-instatement of excavated area</u> All excavated area and disturbed area for temporary works utilities diversion, temporary road diversion, and pipeline works shall be reinstated to former conditions or better, to the satisfaction of the relevant Government departments. • <u>Aesthetic landscape and architectural treatment for DIH</u> The above ground structures shall be designed to ensure the element with colour, texture and tonal quality being compatible to the existing urban context. • <u>Roof greening of large built structures</u> Roof greening to mitigate the visual impact of the large roof area of aboveground structures on the VSRs at high level • <u>Aesthetic design on Noise Barrier</u> 					

Environmental Mitigation Implementation Schedule – SCL (HHS)

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
		<ul style="list-style-type: none"> Noise barrier shall be sensitively designed to minimize visual impact upon adjacent VSRs. Transparent noise barrier panel should be used as far as practical. If use of transparent panel material is not possible due to technical concerns, solid noise barrier panel of non-reflective material in neutral colours will be adopted together with aesthetic treatment to minimise any potential visual impact. 					

Environmental Mitigation Implementation Schedule – SCL (HHS)

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
Construction Dust Impact							
S7.6.6	D1	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIA criteria
S7.6.6	D2	<ul style="list-style-type: none"> • Mitigation measures in form of regular watering under a good site practice should be adopted. Watering once per hour on exposed worksites and haul road should be conducted to achieve dust removal efficiencies of 91.7%. While the above watering frequencies are to be followed, the extent of watering may vary depending on actual site conditions but should be sufficient to maintain an equivalent intensity of no less than 1.8 L/m² to achieve the dust removal efficiency. 	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIA criteria
S7.6.6	D3	<ul style="list-style-type: none"> • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones. • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure 	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIA criteria

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		<p>that the dusty materials do not leak from the vehicle;</p> <ul style="list-style-type: none"> • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided and properly maintained as far as practicable along the site boundary with provision for public crossing; Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; • Any skip hoist for material transport should be totally enclosed by 					

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		impervious sheeting; <ul style="list-style-type: none"> • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. 					
S7.6.6	D4	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected representative dust monitoring station	Construction stage	<ul style="list-style-type: none"> • TM-EIA

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Construction Airborne Noise							
S8.5.6	AN1	Implement the following good site practices: <ul style="list-style-type: none"> • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, mobile container site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities. 	Control construction airborne noise	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> • Annex 5, TM-EIA
S8.5.6	AN2	Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings shall be properly maintained throughout the construction period.	Reduce the construction noise levels at low-level zone of NSRs through partial screening.	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> • Annex 5, TM-EIA
S8.5.6	AN3	Install movable noise barriers (typical design is wooden framed barrier with a small-cantilevered on a skid footing with 25mm thick internal sound absorptive lining), acoustic mat or full enclosure, screen the noisy plants including air compressor, generators and saw.	Screen the noisy plant items to be used at all construction sites	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> • Annex 5, TM-EIA

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S8.5.6	AN4	Use of "Quiet" Plant	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIA
S8.5.6	AN5	Sequencing operation of construction plants where practicable.	Operate sequentially within the same work site to reduce the construction airborne noise	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIA
S8.5.6	AN6	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected representative noise monitoring stations	Construction stage	• TM-EIA
Operational Railway Airborne Noise							
S8.6.4	AN7	Provide mitigation measures before operation of the Project as stated below: <ul style="list-style-type: none"> • 7m high semi-enclosure extending from the edge of the podium to the realigned Cheong Wan Road (P1) Bridge with a structural separation to allow independent movement between the two structures; • Approximately 35m long of noise barrier at a height of 5m from Cheong Wan Road towards north (P2); and • Approximately 45m long of noise barrier at a height of 5m from Chatham Road North towards south (P3). 	Control operation airborne noise from railway	MTR Corporation	Refer to Figure 8.1	Prior to operation of the Project	• Noise Control Ordinance and its TM
S8.6.4	AN8	Airborne noise commissioning test shall be conducted at the proposed monitoring locations prior to the operation of the project	To comply with the noise criteria of Noise Control Ordinance	MTR Corporation	Identified airborne noise monitoring stations	Prior to operation of the Project	• Noise Control Ordinance
Operational Fixed Noise							

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S8.6.5	AN9	<p>The detailed design should incorporate the following good practices in order to minimize the nuisance on the nearby NSRs.</p> <ul style="list-style-type: none"> • Louvers should be orientated away from adjacent NSRs, preferably onto main roads which are less sensitive. • Direct noise mitigation measures including silencers, acoustic louvers and acoustic enclosures should be allowed for in the design for the stations and stabling sidings • The façade for these plant areas/ventilation shafts should have adequate sound insulation properties to minimise the noise emanating through the building fabric. 	Control operational airborne noise due to the operation of fixed plant	Engineer	Station's ventilation shafts	Design stage	<ul style="list-style-type: none"> • Noise Control Ordinance
Groundborne Noise (Operational Phase)							
S9.6.3	GN1	Groundborne noise commissioning test shall be conducted at the proposed monitoring locations prior to the operation of the project.	To comply with the noise criteria of Noise Control Ordinance	MTR Corporation	Identified groundborne noise monitoring stations	Prior to operation of the Project	<ul style="list-style-type: none"> • Noise Control Ordinance

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Water Quality (Construction Phase)							
S10.7.1	W1	<p>In accordance with the Practice Noise for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), construction phase mitigation measures shall include the following:</p> <p><u>Construction Runoff and Site Drainage</u></p> <ul style="list-style-type: none"> At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities. The design of the temporary on-site drainage system will be undertaken by the contractor prior to the commencement of construction. The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a site/sediment trap. The sediment/silt traps should be incorporated in the permanent drainage channels to enhance deposition rates. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94, which states that the retention time for silt/sand traps should be 5 minutes under maximum flow conditions. Sizes may vary depending upon the flow rate, but for a flow rate of 0.1 m³/s a sedimentation basin of 30m³ would be required and for a flow rate of 0.5 m³/s the basin would be 150 m³. The detailed design of the sand/silt traps shall be undertaken by the contractor prior to the 	To minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance ProPECC PN1/94 TM-EIAO TM-Water

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		<p>commencement of construction.</p> <ul style="list-style-type: none"> • All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks where practicable. Exposed slope surfaces should be covered by tarpaulin or other means. • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas. • Measures should be taken to minimise the ingress of site drainage into excavations. If the excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities. • Open stockpiles of construction materials (for example, aggregates, sand and fill material) of more than 50m³ should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. • Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers. • Precautions be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are 					

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		<p>summarised in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.</p> <ul style="list-style-type: none"> • All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. • Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain. • Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts. • All fuel tanks and storage areas should be provided with locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive receivers nearby. • All the earth works involving should be conducted sequentially to limit the amount of construction runoff generated from exposed areas during the wet season (April to September) as far as 					

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		practicable. <ul style="list-style-type: none"> Adopt Best Management Practices. 					
S10.7.1	W2	<u>Tunnelling Works</u> <ul style="list-style-type: none"> Cut-&-cover/ open cut tunnelling work should be conducted sequentially to limit the amount of construction runoff generated from exposed areas during the wet season (April to September) as far as practicable. Uncontaminated discharge should pass through sedimentation tanks prior to off-site discharge. The wastewater with a high concentration of SS should be treated (e.g. by sedimentation tanks with sufficient retention time) before discharge. Oil interceptors would also be required to remove the oil, lubricants and grease from the wastewater. Direct discharge of the bentonite slurry (as a result of D-wall and bored tunnelling construction) is not allowed. It should be reconditioned and reused wherever practicable. Temporary storage locations (typically a properly closed warehouse) should be provided on site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC PN 1/94 should be adhered to in the handling and disposal of bentonite slurries. 	To minimize construction water quality impact from tunneling works	Contractor	All tunneling portion	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance ProPECC PN 1/94 TM-water TM-EIAO
S10.7.1	W3	<u>Sewage Effluent</u> <ul style="list-style-type: none"> Portable chemical toilets are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance. 	To minimize water quality from sewage effluent	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance TM-water

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S10.7.1	W4	<p><u>Groundwater Seepage</u></p> <ul style="list-style-type: none"> As some proposed works areas at Hung Hom are near Victoria Harbour, high ground water level regime due to both tidal effects and rainwater infiltration is anticipated. Appropriate measures will be deployed to minimize the intrusion of groundwater into excavation works areas. In case seepage of groundwater occurs, groundwater should be pumped out from the works areas and discharged into the storm system via silt removal facilities. Groundwater from dewatering process should also be discharged into the storm system via silt traps. 	To minimize groundwater quality impact from contaminated area	Contractor	Excavation areas where contamination is found.	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance TM-water TM-EIAO
S10.7.1	W5	<p><u>Accidental Spillage</u></p> <p>In order to prevent accidental spillage of chemicals, the following is recommended:</p> <ul style="list-style-type: none"> Proper storage and handling facilities should be provided; All the tanks, containers, storage area should be bunded and the locations should be locked as far as possible from the sensitive watercourse and stormwater drains; The Contractor should register as a chemical waste producer if chemical wastes would be generated. Storage of chemical waste arising from the construction activities should be stored with suitable labels and warnings; and Disposal of chemical wastes should be conducted in compliance with the requirements as stated in the Waste disposal (Chemical Waste) (General) Regulation. 	To minimize water quality impact from accidental spillage	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance ProPECC PN1/94 TM-EIAO TM-Water
Water Quality (Operational Phase)							
S10.7.2	W6	<ul style="list-style-type: none"> Mitigation measures are only required to mitigate runoff from train tabling sidings during the operational phase. The following 	To control runoff from train stabling sidings	MTR Corporation	Train stabling sidings	Operational Stage	<ul style="list-style-type: none"> Water Pollution Control

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		<p>mitigation measures during operational phase are recommended:</p> <ul style="list-style-type: none"> • Track runoff from train stabling sidings (covered section) and tunnel should pass through oil/grit interceptors/chambers to remove oil, grease and sediment before being pumped to the public foul drainage system; • Track runoff from the fan area and launching/ retrieval tracks (open track section) should pass through oil/grit interceptors/chambers to remove oil, grease and sediment before being pumped to the public storm water drain system; • The silt traps and oil interceptors should be cleaned and maintained regularly; and • Oily contents of the oil interceptors should be transferred to an appropriate disposal facility, or to be collected for reuse, if possible. 					<p>Ordinance</p> <ul style="list-style-type: none"> • TM-Water

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Waste Management (Construction Waste)							
S11.4.1.1	WM1	<p><u>On-site sorting of C&D material</u></p> <ul style="list-style-type: none"> Geological assessment should be carried out by competent persons on site during excavation to identify materials which are not suitable to use as aggregate in structural concrete (e.g. volcanic rock, Aplite dyke rock, etc). Volcanic rock and Aplite dyke rock should be separated at the source sites as far as practicable and stored at designated stockpile areas preventing them from delivering to crushing facilities. The crushing plant operator should also be reminded to set up measures to prevent unsuitable rock from ended up at concrete batching plants and be turned into concrete for structural use. Details regarding control measures at source site and crushing facilities should be submitted by the Contractors for the Engineer to review and agree. In addition, site records should also be kept for the types of rock materials excavated and the traceability of delivery will be ensured with the implementation of Trip Ticket System and enforced by site supervisory staff as stipulated under DEVB TC(W) No. 6/2010 for tracking of the correct delivery to the rock crushing facilities for processing into aggregates. Alternative disposal option for the reuse of volcanic rock and Aplite Dyke rock, etc should also be explored. 	Separation of unsuitable rock from ending up at concrete batching plants and be turned into concrete for structural use	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> DEVB TC(W) No. 6/2010
S11.5.1	WM2	<p><u>Construction and Demolition Material</u></p> <ul style="list-style-type: none"> Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; Carry out on-site sorting; Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; 	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Land (Miscellaneous Provisions) Ordinance Waste Disposal Ordinance ETWB TCW No.

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		<ul style="list-style-type: none"> • Adopt 'Selective Demolition' technique to demolish the existing structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; • Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified; and • Implement an enhanced Waste Management Plan similar to ETWBTC (Works) No. 19/2005 – "Environmental Management on Construction Sites" to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction. • In addition, disposal of the C&D materials onto any sensitive locations such as agricultural lands, etc. should be avoided. The Contractor shall propose the final disposal sites to the Project Proponent and EPD and get their approval before implementation 					19/2005
S11.5.1	WM3	<p><u>C&D Waste</u></p> <ul style="list-style-type: none"> • Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden hoardings should not be used, as in other projects. Metal hoarding should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage. • The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as 	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005

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		fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites should be considered for such segregation and storage.					
S11.5.1	WM4	<p><u>General Refuse</u></p> <ul style="list-style-type: none"> • General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes. • A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. • Aluminium cans should be often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible. • Office wastes should be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered by the Contractor. 	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S11.5.1	WM5	<p><u>Land-based Sediment</u></p> <ul style="list-style-type: none"> • All construction plant and equipment shall be designed and maintained to minimize the risk of silt, sediments, contaminants or other pollutants being released into the water column or deposited in the locations other than designated location; • All vessels shall be sized such that adequate draft is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; 	To control pollution due to land-based sediment	Contractor	Kai Tak Area	Construction Stage	<ul style="list-style-type: none"> • ETWB TCW No. 34/2002

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		<ul style="list-style-type: none"> • Before moving the vessels which are used for transporting dredged material, excess material shall be cleaned from the decks and exposed fittings of vessels and the excess materials shall never be dumped into the sea except at the approved locations; • Adequate freeboard shall be maintained on barges to ensure that decks are not washed by wave action. • The Contractors shall monitor all vessels transporting material to ensure that no dumping outside the approved location takes place. The Contractor shall keep and produce logs and other records to demonstrate compliance and that journeys are consistent with designated locations and copies of such records shall be submitted to the engineers; • The Contractors shall comply with the conditions in the dumping licence. • All bottom dumping vessels (Hopper barges) shall be fitted with tight fittings seals to their bottom openings to prevent leakage of material; and • The material shall be placed into the disposal pit by bottom dumping. 					
S11.5.1	WM6	<p><u>Chemical Waste</u></p> <ul style="list-style-type: none"> • Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. • Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450L unless the specification has been 	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal (Chemical Waste) (General) Regulation • Code of Practice on the Packaging, Labelling and Storage of

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		<p>approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation.</p> <ul style="list-style-type: none"> The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste; be enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; be covered to prevent rainfall entering; and be arranged so that incompatible materials are adequately separated. Disposal of chemical waste should be via a licensed waste collector; and be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD. 					Chemical Waste
Waste Management (Operational Waste)							
S11.5.2	WM7	<p><u>General Refuse and Industrial Waste</u></p> <p>A reputable waste collector should be employed to remove general refuse and industrial wastes from the stations on a daily basis to minimize odour, pest and litter impacts.</p>	Minimize production of the general refuse and avoid odour, pest and litter impacts	MTR Corporation	SCL Stations, Ventilation Building and Stabling Sidings	Operational stage	<ul style="list-style-type: none"> Waste Disposal Ordinance
S11.5.2	WM8	<p><u>Chemical Waste</u></p> <p>The requirements given in the Code of Practice on the Packaging,</p>	Minimize production of the chemical waste	MTR Corporation	SCL Stations and Stabling Sidings	Operational stage	<ul style="list-style-type: none"> Waste Disposal Ordinance

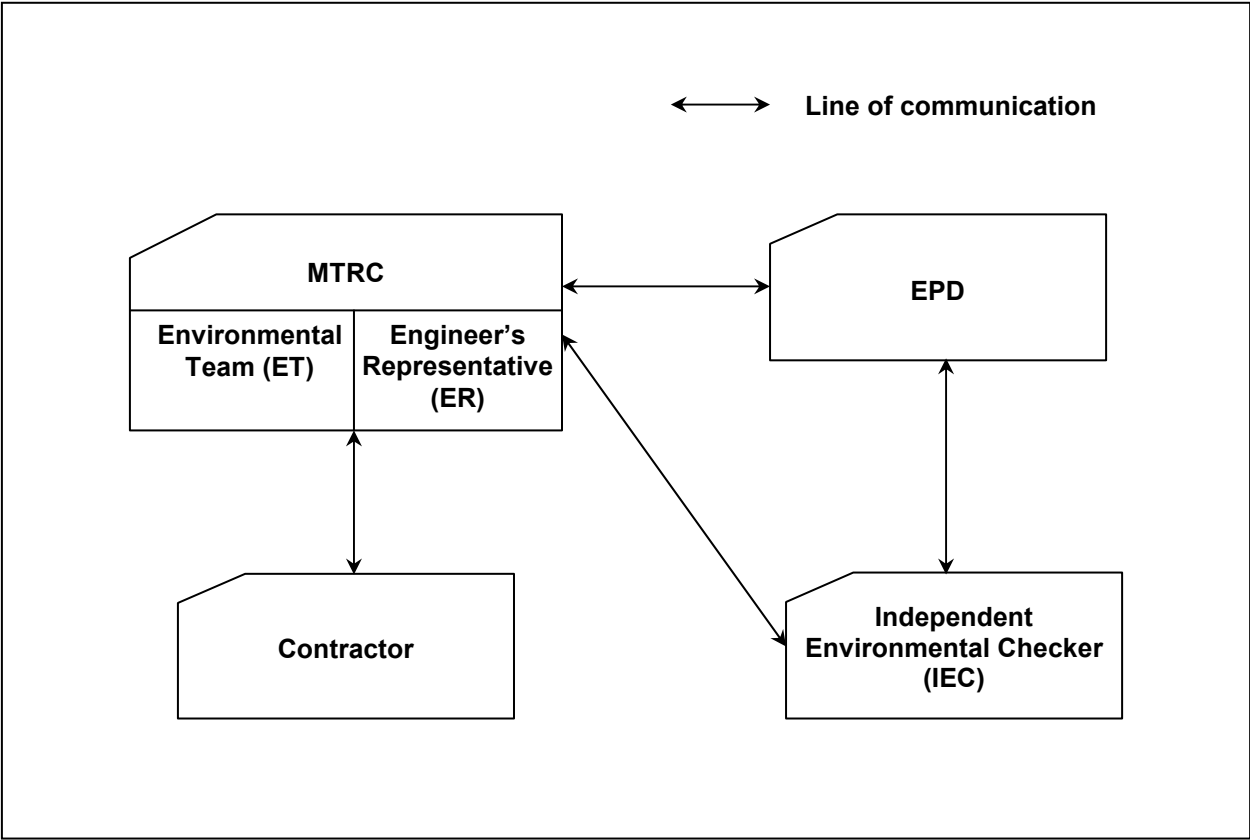
Environmental Mitigation Implementation Schedule – SCL (HHS)

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to implement the measures?	What requirements or standards for the measures to achieve?
		<p>Labelling and Storage of Chemical Wastes should be followed in handling of these chemical wastes. A trip-ticket system should be operated in accordance with the Waste Disposal (Chemical Waste) (General) Regulation to monitor all movements of chemical wastes which will be collected by a licensed collector to a licensed facility for final treatment and disposal.</p>					
EM&A Project							
S13.2	EM1	<p>An Independent Environmental Checker needs to be employed as per the EM&A Manual.</p>	Control EM&A Performance	MTR Corporation	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO
S13.2 – 13.4	EM2	<p>An Environmental Team needs to be employed as per the EM&A Manual</p> <p>Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures.</p> <p>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.</p>	Perform environmental monitoring & auditing	MTR Corporation/ Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO

Appendix B

Project Organisation for Environmental Works

Project Organisation for Environmental Works



Appendix C

Sample Data Sheet for 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 :

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 D

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 :

Appendix E

Proactive Environmental Protection Proforma

Proactive Environmental Protection Proforma

Ref: _____

Ref ⁽¹⁾	Proposed Construction Method ⁽²⁾	Location/ Working Period	Anticipated Impacts	Recommended Mitigation Measures

Notes:

(1) *EIA Ref/EM&A Log Ref/Design Document Ref*

(2) *Details of equipment, vehicles, plants, processes, technologies for the option of construction method*

Reviewed by Environmental Team Leader: _____

Date _____

Approved by Independent Checker (Environment): _____

Date: _____