West Kowloon Cultural District

Environmental Monitoring and Audit Manual (Rev. E)

July 2013

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1. Introduction

1.1 Purpose of the Manual

The purpose of this Environmental Monitoring and Audit (EM&A) Manual (hereafter referred to as the Manual) is to guide the setup of an EM&A programme to ensure compliance with the Environmental Impact Assessment (EIA) study recommendations, to assess the effectiveness of the recommended mitigation measures and to identify any further need for additional mitigation measures or remedial action. This Manual outlines the monitoring and audit programme proposed for the "West Kowloon Cultural District" (The Project).

It should be noted that this EM&A Manual would be further reviewed and updated where necessary.

1.2 Project Description

The West Kowloon Cultural District Authority (WKCDA), empowered by the WKCDA Ordinance (Cap. 601), was set up by the Government with the full support of the Legislative Council (LegCo) in October 2008 to take forward the WKCD project.

The WKCDA is responsible for the preparation of a comprehensive Development Plan (DP). The WKCDA intends to prepare the DP in three stages, namely:

i. To conduct an exercise to gauge stakeholders' expectations and aspirations for the DP of the WKCD as well as their views on the design and functional requirements of the CACF;

ii. To prepare three Conceptual Plan (CP) Options; and

iii. In the light of public comments on the CP Options collected in a Public Engagement (PE) exercise, select one option out of the three with any modifications as deemed fit by the WKCDA.

The Selected Option with modifications would then be developed into a DP for submission to the Town Planning Board (TPB) for consideration, and then to the Chief Executive in Council for approval. Upon approval, the DP would serve as the basis for implementation.

Further to the submission of the DP on 30 December 2011, and agreement of the DP by TPB on 9 March 2012, the project area and project layout to be taken forward is shown in **Figure 1.1**.

1.2.1 Existing Site Conditions

The West Kowloon Cultural District (WKCD) site is located on the West Kowloon Reclamation south of Austin Road West and the Western Harbour Crossing Toll Plaza as shown in **Figure 1.1**. The site is currently zoned as "West Kowloon Cultural District Development Plan Area" under the approved South West Kowloon Outline Zoning Plan (No. S/K20/27) gazetted on 8 January 2013, and comprises approximately 40ha of land bordering the Jordan/Tsim Sha Tsui area. The site reserved for the WKCD development is currently occupied by works sites, local roads, temporary storage / parking facilities, a temporary promenade at the Waterfront and a number of existing infrastructure and utility facilities such as ventilation buildings for the Western Harbour Crossing and the MTR railway line, a sea water pumping station, etc. Parts of the WKCD site are also currently occupied by the Tsim Sha Tsui Fire Station and by

the works site and temporary works areas for the Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link (XRL) project.

1.2.2 Project Components

Following from recommendations by the Consultative Committee on the Core Arts and Cultural Facilities (CACF) of WKCD in 2006, a number of CACF were proposed, including both performing arts and visual arts venues. Other facilities including hotel, offices and residential (HOR) and Government, Institution or Community facilities (GIC) were also recommended. Plans to embed sustainability into these core facilities and the WKCD area include adoption of green building designs, renewable energy technologies, water and energy conservation measures, and green transportation.

The proposed WKCD development will comprise the following major facilities.

Core Arts and Cultural Facilities (CACF)

The CACF will consist of:

- A Mega Performance Venue, an enclosed facility designed for popular amplified music events, with the flexibility to accommodate other art forms and large-scale entertainment events;
- Exhibition Centre Complex designed for large-scale cultural, entertainment and commercial events with facilities to support entrepreneurial arts related events and cultural activities – extending from art fairs and book fairs to fashion shows, performance installations, product launches and celebrations and galas;
- A Great Theatre, designed for large-scale productions optimised for a wide range of amplified music theatrical performances with supporting facilities such as spacious foyer designed to accommodate small-scale informal performances and temporary exhibitions, VIP rooms, box lounges, integrated retail and dining facilities, and ample rehearsal spaces;
- A Musical Theatre, intended primarily for broadway-style musicals and performances of other art forms, including western and Chinese opera and dance;
- A Lyric Theatre, a facility with an orchestra pit for dance, ballet, opera, musicals and theatrical performances, which is designed principally for operatic and dramatic performances, various forms of dance and a wide range of art forms, incorporating unamplified and amplified music accompaniment;
- A Centre for Contemporary Performance (CCP) comprising three flexible performing spaces of different sizes (blackbox theatres) and additional workshop/classrooms for educational programs. The CCP will be a facility for contemporary performing arts, mulit- and cross disciplinary, multimedia theatre, music and dance;
- Thrust Theatres, primarily designed to meet the needs of larger contemporary dance ensembles and spoken-word drama with amplified music;
- Proscenium Theatre, designed for medium-scale theatrical and dance performances with amplified music, primarily to meet the needs of spoken word theatre and various forms of dance;
- Outdoor Theatre, integrated within the landscape design of the Great Park, designed as a space primarily for both free and ticketed amplified or electronically reinforced music performance;

- A Music Centre comprising a Concert Hall and a Recital Hall, designed for the acoustics and performance requirements of large scale unamplified instrumental and vocal music, of both western and Chinese origin;
- A Xiqu Centre with Large Theatre and Small Theatre as well as a commercially operated teahouse – showcase and education venue for Chinese opera, and a single balcony courtyard type venue with integrated catering facilities;
- An enclosed Freespace with Music Box – a physical cluster of two indoor venues. The two indoor venues are namely Music Box and Freespace Theatre. Music Box is intended for the presentation of pop culture events with a focus on music, and is highly flexible for stage position and seating configuration. Freespace theatre is intended for popular and experimental performances such as music, theatre and dance. This venue is highly flexible and offers an opportunity for the presentation of broad range of performance types with stalls format; and
- A museum (Museum Plus) for visual culture – contemporary art, design, architecture, moving image and popular culture – looking at the world from a Hong Kong perspective.

Other Arts and Cultural Facilities (OACF)

The CACF will be supported by the OACF which include Resident Company Centres, Arts and Craft Studios, Pavilions and Literary Arts Centre.

Infrastructure and Support Facilities

The WKCD will also involve the following infrastructure and support facilities:

- Government, Institution or Community (GIC) facilities including electricity substation, police post etc.;
- Various retail, dining and entertainment (RDE) facilities; and hotel, office and residential (HOR) developments. All residential buildings inside WKCD will be mixed with commercial components such as RDE and office at lower floors to support the leisure lifestyle and minimize the environmental impacts at residential floors;
- A district cooling system to provide chilled water for WKCD facilities for substantial energy saving, with possible extension to Government, Institution or Community facilities and hotel, office and residential developments subject to technical, financial and implementation mechanisms;
- On-site renewable energy systems e.g., wind turbines and photovoltaics for local electricity supply;
- A green transportation system in the form of travellators and eco-buses (operating in the underpass road), coupled with substantial pedestrianisation within the WKCD;
- Local road networks comprising a main underpass of approximately 1400m in length, a flyover bridge of approximately 200m in length across the Western Harbour Crossing toll plaza, at-grade link roads, lay-bys and emergency vehicular access;
- Other accessibility features including possible external footbridge connections from WKCD to Kowloon Park, China Ferry Pier, the International Commerce Centre, Elements mall, and pedestrian links (e.g. subway and landscape deck) to West Kowloon Terminus and Austin Station;
- One optional viewing platform and two possible piers for water access subject to the Protection of the Harbour Ordinance (Cap. 531). The viewing platform is an extension of the waterfront

promenade, possibly composed of cantilever structure on top of seabed and foreshore. The two possible piers aims to enable marine connectivity for visitor to the MPV/EC and the Great Theatre;

- Park – extensive areas of grass and open space with trees offering shade for open air leisure, recreation, refreshment and walking, allow people to relax and find quiet spaces together;
- Modification of seawalls for the construction of seawater discharges/outfalls and landing steps near south or south-west boundary of the WKCD site;
- Optional water reuse facilities – options to be considered include green building initiatives such as rainwater harvesting and/or reuse of condensate from air conditioning systems;
- Optional automatic refuse collection system, if technically feasible and financially viable; The system aims to enhance recycling and to minimize nuisance to be caused from typical waste collection. Should the automatic refuse collection system be implemented, the piping network will be installed underground and rely on transport of waste by vacuum, replacing the traditional refuse room and waste container;
- Possible relocation of the existing Tsim Sha Tsui Fire Station located at the south east boundary of the WKCD site in stages; and
- Associated utilities, drainage, sewerage, sewage pump sumps, waterworks, engineering works, landscaping and environmental mitigation measures.

1.3 Tentative Construction Programme

It is targeted to commence construction of the critical elements of the WKCD in 2013 so as to commission the Phase 1 arts and cultural facilities in stages starting from 2014/2015. A tentative construction programme and sequence of works are shown in **Appendix A**.

1.4 Project Organisation

The proposed project organisation is shown in **Figure 1.2**. The responsibilities of respective parties are set out below.

West Kowloon Cultural District Authority (WKCDA)

WKCDA is the Project Proponent for the development of the Project, and will assume overall responsibility for the Project.

Environmental Protection Department (EPD)

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

Engineer or the Engineer's Representative (ER)

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

- to monitor the Contractor's compliance with Contract Specifications, including the effective implementation and operation of the environmental mitigation measures;
- to employ an Independent Environmental Checker (IEC) to audit the results of the EM&A works carried out by the Environmental Team (ET);
- to monitor Contractors', ET's and IEC's compliance with the requirements in the Environmental Permit (EP) and EM&A Manual;
- to facilitate ET's implementation of the EM&A programme;
- participate in joint site inspection by the ET and IEC;
- to oversee the implementation of the agreed Event / Action Plan in the event of any exceedance; and,
- to adhere to the procedures for carrying out complaint investigation.

The Contractor

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

- to comply with the relevant contract conditions and specifications on environmental protection;
- to employ an ET to undertake monitoring, laboratory analysis and reporting of EM&A;
- to facilitate ET's monitoring and site inspection activities;
- to participate in the site inspections undertaken by the ET and IEC, and undertake any corrective actions;
- to provide information / advice to the ET regarding works programme and activities which may contribute to the generation of adverse environmental impacts;
- to submit proposals on mitigation measures in case of exceedance of Action and Limit levels in accordance with the Event / Action Plans;
- to implement measures to reduce impact where Action and Limit levels are exceeded; and,
- to adhere to the procedures for carrying out complaint investigation.

Environmental Team (ET)

The ET should be employed by the WKCDA / Contractor to conduct the EM&A programme. The ET should be managed by the ET Leader. ET Leader should have relevant professional qualifications in environmental control and possess at least 7 years experience in EM&A. Suitably qualified staff should be included in the ET, and resources for the implementation of the EM&A programme should be allocated in the time under the Contract, to enable fulfilment of the Project's EM&A requirements as specified in the EM&A Manual during construction of the Project. The ET should report to WKCDA and the duties should include:

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

- to monitor compliance with conditions in the EP, environmental protection, pollution prevention and control regulations and contract specifications;
- to audit environmental conditions on site;
- to report on the environmental monitoring and audit results to EPD, the ER, the IEC and Contractor or their delegated representatives;
- to recommend suitable mitigation measures to the Contractor in the case of exceedance of Action and Limit levels in accordance with the Event and Action Plans;
- to liaise with the IEC on all environmental performance matters, and ensure timely submission of all relevant EM&A pro forma for IEC's approval;
- to provide advice to the Contractor on environmental improvement, awareness and enhancement matters, etc on site;
- to adhere to the procedures for carrying out complaint investigation;
- to prepare reports on the environmental monitoring data and the site environmental conditions;
- to submit the EM&A report to Director of Environmental Protection (DEP) timely;
- to review proposals of mitigation measures from the Contractor in case of exceedance of Action and Limit levels, in accordance with Event and Action Plan; and,
- to carry out site inspection to investigate and audit the Contractor's site practice, equipment and work methodologies with respect to pollution control and mitigation measures.

Independent Environmental Checker (IEC)

The IEC is empowered to audit the environmental performance of construction, but is independent from the management of construction works. As such, the IEC should not be in any way an associated body of the Contractor or the ET for the Project. The IEC should be employed by WKCDA prior to the commencement of the construction of the Project. The IEC should be a person who has relevant professional qualifications in environmental control and at least 7 years experience in EM&A and environmental management. The duties and responsibilities of the IEC are:

- to provide proactive advice to the ER and WKCDA on EM&A matters related to the project.
- to review and verify the monitoring data and all submissions in connection with the EP and EM&A Manual submitted by the ET;
- to arrange and conduct regular, at least monthly site inspections of the works during the construction phase, and to carry out ad hoc inspections if significant environmental problems are identified;
- to check compliance with the agreed Event / Action Plan in the event of any exceedance;
- to check compliance with the procedures for carrying out complaint investigation;
- to check the effectiveness of corrective measures;
- to feedback audit results to the ET by signing off relevant EM&A pro forma;
- to check that mitigation measures are effectively implemented;
- to report the works conducted, and the findings, recommendations and improvements of the site inspections, after reviewing ET's and Contractor's works, to the ER and WKCDA on a monthly basis;

- to verify the investigation result of the environmental complaint cases and the effectiveness of corrective measures;
- to verify EM&A report that has been certified by ET leader; and,
- to audit EIA recommendations and requirements against the status of implementation of environmental mitigation measures on site.

2. Air Quality Impact

2.1 Construction Air Quality Monitoring

2.1.1 General

It is proposed to carry out environmental monitoring and audit during the construction phase of the Project to check and ensure compliance with the relevant air quality standards by effective implementation of the recommended construction dust mitigation measures. Potential air quality impact arising from the construction works would mainly be due to excavation, materials handling, spoil removal, wind erosion and land formation, as well as the operation of a concrete batching plant and barging facilities.

The key objectives of the construction phase dust monitoring are:

- to identify the extent of dust impact during construction phase on sensitive receivers;
- to audit the compliance of the Contractor with regard to dust control, contract conditions and the relevant dust impact criteria;
- to determine the effectiveness of mitigation measures to control fugitive dust emission from activities during the construction phase;
- to recommend further mitigation measures if found to be necessary, and;
- to comply with Action and Limit Levels for air quality as defined in this Manual.

Details of the environmental monitoring and audit requirements during construction phase are presented below.

2.1.2 Air Quality Parameters

Monitoring and audit of the Total Suspended Particulate (TSP) levels during the construction phase should be carried out by the Environmental Team (ET) to ensure that any deteriorating air quality could be readily detected and timely actions taken to rectify the situation.

The TSP levels should be measured by following the standard method as set out in High Volume Method for Total Suspended Particulates, Part 50 Chapter 1 Appendix B, Title 40 of the Code of Federal Regulations of the USEPA (HVS method).

One-hour and 24-hour TSP levels should be measured to indicate the impacts of construction dust on air quality. Upon approval of the IEC, one-hour TSP levels can be measured by direct reading methods which are capable of producing comparable results as that by the HVS method, to indicate short event impacts.

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, other special phenomena and work progress of the concerned project area, etc should be recorded. A sample data record sheet is shown in **Appendix B**. The ET may develop a project specific record sheet to suit this EM&A programme.

2.1.3 Monitoring Equipment

High Volume Sampler (HVS) in compliance with the following specifications should be used for carrying out the one-hour or 24-hour TSP monitoring:

- 0.6 - 1.7 m^3/min (20 - 60 standard cubic feet per minute) adjustable flow range;
- equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operation;
- installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation;
- capable of providing a minimum exposed area of 406 cm^2 (63 in^2);
- flow control accuracy: +/- 2.5% deviation over 24-hr sampling period;
- incorporated with an electronic mass flow rate controller or other equivalent devices;
- equipped with a flow recorder for continuous monitoring;
- provided with a peaked roof inlet;
- incorporated with a manometer;
- able to hold and seal the filter paper to the sampler housing at horizontal position;
- easy to change the filter, and;
- capable of operating continuously for 24-hour period.

The ET is responsible for provision of the monitoring equipment. They should ensure that sufficient numbers of HVSs with an appropriate calibration kit are available for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. The HVSs should 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., should be clearly labelled.

Initial calibration of dust monitoring equipment should be conducted upon installation and thereafter at bi-monthly intervals. The transfer standard should be traceable to the internationally recognised primary standard and be calibrated annually. The concern parties such as Independent Environmental Checker (IEC) should 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 should be verified to be constant and be recorded in the data sheet, shown in **Appendix B**.

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

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

- the wind sensors should be installed 10 m above ground so that they are clear of obstructions or turbulence caused by buildings;
- the wind data should be captured by a data logger. The data should be downloaded for analysis at least once a month;
- the wind data monitoring equipment should be re-calibrated at least once every six months, and;
- wind direction should be divided into 16 sectors of 22.5 degrees each.

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

2.1.4 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, should be available for sample analysis, 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 should be approved by the WKCDA and the measurement procedures should be witnessed by the IEC. Any measurement performed by the laboratory should be demonstrated to the satisfaction of the WKCDA and IEC. IEC should regularly audit to the measurement performed by the laboratory to ensure the accuracy of measurement results. The ET Leader should provide the WKCDA with one copy of the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B for his reference.

Filter paper of size 8" x 10" should be labelled before sampling. It should be a clean filter paper with no pinholes, and should 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 should be kept in a clean and tightly sealed plastic bag. The filter paper should 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 should be regularly calibrated against a traceable standard.

All collected samples should be kept in good condition for six months before disposal.

2.1.5 Monitoring Location

Five air quality monitoring locations are proposed and summarised in **Table 2.1** and shown in **Figure 2.1**, subject to approval from the premises landlord for dust monitoring equipment installation. The status and locations of dust sensitive receivers may change after issuing this report. If such cases exist, the ET should propose updated monitoring locations and seek agreement from EPD, and agreement from WKCDA and IEC before baseline monitoring commences.

Table 2.1: Construction Air Quality Monitoring Stations

ID	Description
AM1	International Commerce Centre

ID	Description
AM2	The Harbourside Tower 1
AM3	The Victoria Towers - Tower 1
AM4	Canton Road Government Primary School
AM5	Topside Developments at West Kowloon Terminus Site (Monitoring to start after completion of development in 2015, subject to the construction programme of XRL)

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

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

Monitoring equipment must be positioned, sited and orientated properly. The ET should agree with the WKCDA 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 should be noted:

- a horizontal platform with appropriate support to secure the samplers against strong wind should be provided;
- no two samplers should be placed less than two meters apart;
- the distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler;
- a minimum of two meters of separation from walls, parapets and penthouses is required for rooftop samplers;
- a minimum of two meters separation from any supporting structure, measured horizontally is required;
- no furnace or incinerator flue is nearby;
- airflow around the sampler is unrestricted;
- the sampler is more than 20 meters from the dripline;
- wire fence or gates used to protect the sampler, should not cause any obstruction during monitoring;
- permission must be obtained to set up the samplers and to obtain access to the monitoring stations, and;
- a secured supply of electricity is needed to operate the samplers.

The ET may, depending on site conditions and monitoring results, decide whether additional monitoring locations should be included or any monitoring locations could be removed / relocated during any stage of the construction phase.

2.1.6 Baseline Monitoring

Baseline monitoring should be conducted at all designated monitoring locations, see **Table 2.1**, for at least 14 consecutive days before commencement of construction work to obtain daily ambient 24-hour TSP samples. The selected baseline monitoring stations should reflect baseline conditions at the stations. One-

hour sampling should also be done at least three times per day when the highest dust impacts are expected. The baseline monitoring will provide data for the determination of the appropriate Action Levels with the Limit Levels set against statutory or otherwise agreed limits. General meteorological conditions (wind speed, wind direction and precipitation) and notes regarding any significant adjacent dust producing sources should also be recorded throughout the baseline monitoring period.

During the baseline monitoring, there should not be any construction or dust generating activities in the vicinity of the monitoring stations. Before commencing baseline monitoring, the ET should inform the IEC of the baseline monitoring programme such that 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 during the baseline monitoring period, the ET leader should carry out the monitoring at alternative locations that can effectively represent the baseline conditions at the impact monitoring locations. The alternative baseline monitoring locations should be approved by the WKCDA and agreed with the IEC.

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

Ambient conditions may vary seasonally and should be reviewed once every six months. When the ambient conditions have changed and a repeat of the baseline monitoring is required to be carried out for obtaining the updated baseline levels; the monitoring should be at times when the Contractor's activities are not generating dust, at least in the proximity of the monitoring stations. Should change in ambient conditions be determined, the baseline levels and, in turn, the air quality criteria, should be revised. The revised baseline levels and air quality criteria should be agreed with the IEC and EPD.

2.1.7 Impact and Compliance Monitoring

The monthly schedule of the compliance and impact monitoring programme should be drawn up by the ET one month prior to the commencement of the scheduled construction period

The ET should carry out impact monitoring at all the proposed monitoring stations, except AM5, throughout the entire construction work period. The impact monitoring at AM5 will be started after completion of the XRL project. For regular impact monitoring, the sampling frequency of at least once in every six days, should be strictly observed at all the monitoring stations for 24-hour TSP monitoring. For one-hour TSP monitoring, the sampling frequency of at least three times in every six days should be undertaken when the highest dust impact occurs. Before commencing baseline monitoring, the ET should inform the IEC of the impact monitoring programme. The IEC can carry out on-site audit to ensure accuracy of the impact monitoring results.

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

In case of non-compliance with the air quality criteria, more frequent monitoring, as specified in the Action Plan, should be conducted within 24 hours after the result is obtained. This additional monitoring should be continued until the excessive dust emission or the deterioration in air quality is rectified and agreed with WKCDA and the IEC.

2.1.8 Audit Requirements

Audit of the TSP levels should be carried out by the ET to ensure that any deteriorating air quality could be readily detected and timely action taken to rectify the situation.

2.1.9 Event and Action Plan for Air Quality

Baseline monitoring results form the basis for determining the air quality criteria for the impact monitoring. The ET should compare the impact monitoring results with air quality criteria set up for 24-hour TSP and one-hour TSP level. Air quality criteria which name Action and Limit (AL) Levels to be used are shown in **Table 2.2**, AL are to be agreed between the ET, IEC and WKCDA prior to air monitoring commencement. Event and Action Plan (**Table 2.3**) list the action should be carried out when non-compliance of the air quality criteria occurs.

Table 2.2: Typical Action and Limit Level for Air Quality

Parameter	Action Level	Limit Level
24-hr TSP Level in µg/m^3	For baseline level ≤ 200 µg/m³, Action level = (130% of baseline level + Limit level)/2 For baseline level > 200 µg/m³, Action level = Limit Level	260
1-hr TSP Level in µg/m^3	For baseline level ≤ 384 µg/m³, Action level = (130% of baseline level + Limit level)/2 For baseline level > 384 µg/m³, Action level = Limit Level	500

Table 2.3: Typical Event and Action Plan for Air Quality

Event	ET	IEC	WKCDA	Contractor
Action Level				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and WKCDA; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and WKCDA; 3. Advise the WKCDA on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures;	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to WKCDA within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Event	ET	IEC	WKCDA	Contractor
	Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and WKCDA; 8. If exceedance stops, cease additional monitoring.	5. Monitor the implementation of remedial measures.		
Limit Level				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform WKCDA, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the WKCDA on the effectiveness of the proposed remedial measures; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	1. Notify IEC, WKCDA, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and WKCDA to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the WKCDA until the exceedance is abated.

2.1.10 Mitigation Measures

Appropriate dust suppression measures should be adopted as required under the relevant requirements stipulated in the *Air Pollution Control (Construction Dust) Regulation* and EPD's *Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)* as well as the good practices for dust control should be implemented to reduce the dust impact. A control programme can be instigated

to monitor the construction process in order to enforce dust controls and modify methods of works where feasible to reduce the dust emission down to acceptable levels. The implementation schedule of recommended air quality mitigation measures is presented in **Appendix C**.

2.2 Operational Odour Monitoring

2.2.1 General

While the odour emission from the nearby New Yau Ma Tei Typhoon Shelter (NYMTTS) is not attributable to the WKCD Project, the odour emission would have potential impacts on the proposed developments within WKCD. In view of this, the key objectives of the odour monitoring are:

- to ascertain the effectiveness of the proposed improvement measures for NYMTTS in reducing the odour emissions; and
- to monitor any on-going odour impacts on the proposed developments within WKCD.

2.2.2 Odour Patrol

Odour patrol should be conducted by independent trained personnel / competent persons (at least 2 odour patrol members) patrolling and sniffing along an odour patrol route surrounding the watercourse boundary of NYMTTS to determine any potential odour impacts arising from NYMTTS. The odour patrol member should participate in a set of screening tests using a certified n-butanol gas with their individual thresholds (n-butanol) that comply with the requirement of European Standard Method (EN13725) in the range of 20 to 80 ppb. They should also be free from any respiratory diseases and do not normally work at or live in the area in the vicinity of typhoon shelter.

The proposed odour patrol route and the proposed sniffing locations along the watercourse boundary of the NYMTTS during operation phase are shown in **Figure 2.2**.

It is proposed to conduct the odour patrol on a monthly basis during summer season (from July to September) of the following two years as a minimum:

- Year 2016 when some of the WKCD facilities such as the Park (Phases 1A and 1B) and Xiqu Center will be in operation and yet the improvement measures for Cherry Street Box Culvert are yet to be completed; and
- Year 2019 when a significant amount of the WKCD facilities will be in operation and the improvement measures for Cherry Street Box Culvert would be completed.

Each odour patrol should be carried out during daytime and evening / night time covering high tide and low tide conditions. No odour patrol should be conducted during rainy days. The need to continue the odour patrol at the end of 2016 would be subject to the odour patrol results and should be agreed with EPD.

The need to further extend the odour patrol after the end of 2019 would depend on the odour patrol results. If the results of detected odour intensity at any sniffing location is higher than 1 due to potential odour emission from NYMTTS in two consecutive months, the odour patrol programme should be extended until the odour intensity at all the sniffing locations have dropped to below 1 in three consecutive months.

The independent trained personnel / competent persons should:

- have their individual odour threhold of n-butanol in nitrogen gas in the range of 20 to 80 ppb/v as required by the European Standard Method (EN 13725);
- be at least 16 year of age and willing and able to follow instructions;
- be free from any respiratory illnesses;
- be engaged for a sufficient period to build up and monitor / detect at several monitoring location;
- not be allowed to smoke, eat, drink (except water) or use chewing gum or sweets 30 min before and during odour intensity analysis;
- take great care not to cause any interference with their own perception or that of others by lack of personal hygiene or the use of perfumes, deodorants, body lotions or cosmetics; and
- not communicate with each other about the results of their choices.

At least two independent trained personnel / competent persons should be selected to form a patrol team to conduct the odour intensity analysis, who should participate in a set of screening tests.

Subject to the prevailing weather forecast condition, odour patrol should be conducted by independent trained personnel / competent persons along the proposed odour patrol route as shown in **Figure 2.2**. During the patrol, the sequence should start from less odorous locations to stronger odorous locations.

The independent trained personnel / competent persons should use their nose (olfactory sensors) to sniff odours at different locations. The main odour emission sources and the areas to be affected by the odour nuisance should be identified.

The perceived odour intensity is to be divided into 5 levels which are ranked in the descending order as follows:

- 0 - Not detected. No odour perceived or an odour so weak that it cannot be easily characterised or described;
- 1 - Slight Identifiable odour, and slight chance to have odour nuisance;
- 2 - Moderate Identifiable odour, and moderate chance to have odour nuisance;
- 3 - Strong Identifiable, likely to have odour nuisance;
- 4 - Extreme Severe odour, and unacceptable odour level.

The independent trained personnel / competent persons should record the findings including time of survey, tidal condition, weather condition such as sunny, fine, cloudy and rainy, odour intensity, odour nature and possible odour sources, and also the local wind speed and direction at each location. In addition, some relevant meteorological data such as daily average temperature, and daily average humidity, on that surveyed day should be obtained from the nearest Hong Kong Observatory Station for reference. A sample data record sheet is shown in **Appendix B**.

2.2.3 Mitigation Measures

The improvement measures for NYMTTS that would help reduce odour emissions have been recommended in the EIA Report. The implementation schedule of these measures are presented in **Appendix C**.

3. Noise Impact

3.1 Construction Airborne Noise Monitoring

3.1.1 Monitoring Requirements

The construction noise level should be measured in terms of the A-weighted equivalent continuous sound pressure level (Leq). Leq (30 minutes) should be used as the monitoring parameter between 0700 and 1900 hours on normal weekdays. For all other time periods, Leq (5 minutes) should be employed for comparison with the Noise Control Ordinance (NCO) criteria.

Supplementary information for data auditing, statistical results such as L10 and L90 should also be obtained for reference.

3.1.2 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 should be used for carrying out the noise monitoring. Immediately prior to and following each noise measurement the accuracy of the sound level meter should be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration level from before and after the noise measurement agree to within 1.0 dB.

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

The ET is responsible for the provision of the monitoring equipment. He should 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 should be clearly labelled.

A sample data record sheet is shown in **Appendix B** for reference.

3.1.3 Monitoring Locations

The noise monitoring locations (refer to **Figure 3.1**) are summarised in **Table 3.1**. The status and locations of noise sensitive receivers may change after issuing this manual. If such cases exist, the ET should propose updated monitoring locations and seek agreement from EPD, the WKCDA and the IEC before baseline monitoring commences.

Table 3.1: Construction Noise Monitoring Stations

ID	ID adopted in Construction Noise Assessment	Description
NM1	HT1	The Harbourside Tower 1
NM2	AST	The Arch - Sun Tower
NM3	VT1	The Victoria Towers - Tower 1

ID	ID adopted in Construction Noise Assessment	Description
NM4	CRGPS	Canton Road Government Primary School
NM5	RD	Development next to Austin Station (Monitoring to start after completion of development in 2015, subject to the construction programme of the development)

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

- monitoring at sensitive receivers close to the major site activities which are likely to have noise impacts;
- monitoring at the noise sensitive receivers as defined in the Technical Memorandum; and
- assurance of minimal disturbance to the occupants during monitoring.

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

3.1.4 Baseline Monitoring

The ET should carry out baseline noise monitoring prior to the commencement of the construction works. The baseline monitoring should be carried out daily for a period of at least two weeks. Before commencing the baseline monitoring, the ET should develop and submit to the IEC the baseline monitoring programme such that the IEC can conduct on-site audit to check accuracy of the baseline monitoring results.

There should not be any construction activities in the vicinity of the stations during the baseline monitoring.

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

3.1.5 Impact Monitoring

Noise monitoring should be carried out at all the designated monitoring stations, except NM5, throughout the entire construction work period. The impact monitoring at NM5 will be started after completion of the XRL project. The monitoring frequency should depend on the scale of the construction activities. The following is an initial guide on the regular monitoring frequency for each station on a weekly basis when noise generating activities are underway:

- one set of measurements between 0700 and 1900 hours on normal weekdays

If construction works are extended to include works during the hours of 1900 – 0700 as well as public holidays and Sundays, additional weekly impact monitoring should be carried out during respective restricted hours periods. Applicable permits under NCO should also be obtained by the Contractor.

If a school exists near the construction activity, noise monitoring should be carried out at the monitoring stations for the schools during the school examination periods. The ET Leader should liaise with the school's personnel and the Examination Authority 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 in **Table 3.3**, should be carried out. This additional monitoring should be continued until the recorded noise levels are rectified or demonstrated to be unrelated to the construction activities.

3.1.6 Event and Action Plan

The Action and Limit (AL) Levels for construction noise are defined in **Table 3.2**. Should non-compliance of the criteria occur, action in accordance with the Event and Action Plan in **Table 3.3** should be carried out.

Table 3.2: Action and Limit Level for Construction Noise

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

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

Table 3.3: Event and Action Plan for Construction Noise

Event	ET	IEC	WKCDA	Action Contractor
Action Level	1. Notify WKCDA, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, WKCDA and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the WKCDA accordingly; 3. Advise the WKCDA on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures.	1. Submit noise mitigation proposals to IEC and WKCDA; 2. Implement noise mitigation proposals.
Limit Level	1. Inform IEC, WKCDA, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and WKCDA on remedial measures required;	1. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC and WKCDA within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; 5. Stop the relevant portion of works as instructed by the WKCDA until the

Event	ET	IEC	WKCDA	Action Contractor
	7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results; 8. If exceedance stops, cease additional monitoring.		exceedance until the exceedance is abated.	exceedance is abated.

3.1.7 Mitigation Measures

Recommended construction noise control and mitigation measures are proposed in the EIA report. The Contractor should be responsible for the design and implementation of these measures under the supervision of the ER and monitored by the ET. The implementation schedule of the recommended noise mitigation measures is presented in **Appendix C**.

3.2 Operational Noise Monitoring

3.2.1 Traffic Noise Monitoring

With implementation of the proposed mitigation measures, no adverse road/marine traffic noise impacts are anticipated from the operation of the Project, hence no environmental monitoring and audit is proposed.

3.2.2 Fixed Plant Noise Monitoring

3.2.2.1 Maximum Permissible Sound Power Levels of Fixed Plant

The maximum permissible sound power levels of the identified fixed noise sources of the Project were predicted in the EIA report. The specified sound power levels should be implemented and refined by the Contractor as appropriate to ensure that the noise impact associated with the fixed plant operations would comply with the noise standards stipulated in the EIAO-TM and NCO.

3.2.2.2 Commissioning Test

Prior to the operation of the Project, the Contractor should conduct noise commissioning tests for all major fixed noise sources within WKCD. The test should be carried out by a qualified person possessing at least 7 years of noise control experience and a corporate membership of Hong Kong Institute of Acoustics or equivalent. The noise commissioning test report should be submitted to the ET Leader,IEC and WKCDA for approval.

3.2.3 Mitigation Measures

The relevant noise mitigation measures have been recommended in the EIA Report. The implementation schedule of the mitigation measures are given in **Appendix C**.

4. Water Quality Impact

4.1 Construction Water Quality Monitoring

4.1.1 Introduction

Marine construction works that have potential water quality impacts include the modification of seawall and construction of landing steps and possible piers/viewing platform. Marine water quality monitoring should be carried out during the course of marine construction works, to ensure that any unacceptable increase in suspended solids/turbidity and decrease in dissolved oxygen due to marine construction activities could be readily detected and timely action be taken to rectify the situation.

4.1.2 Water Quality Parameters

Monitoring of Dissolved Oxygen (DO), Dissolved Oxygen Saturation (DO%), pH, temperature, turbidity, salinity, Suspended Solid (SS) and water depth should be undertaken at designated monitoring locations described in **Section 4.1.3**. All parameters should be measured in-situ whereas SS should be determined by the laboratory. DO should be presented in mg/L and in % saturation.

Sampling should be taken at three water depths, namely, 1m below water surface, mid-depth and 1m above sea bed, except at where the water depth is less than 6m and in which case the mid-depth station may be omitted. When the water depth is less than 3m, only the mid-depth station will be monitored.

The following sections describe the sampling procedure and monitoring equipments recommended for conducting the monitoring.

4.1.2.1 Sampling Procedure and Monitoring Equipment

Water samples for all monitoring parameters should be collected, stored, preserved and analysed according to Standard Methods, APHA 21st ed. and/or methods agreed by EPD. In-situ measurements at monitoring locations including DO, temperature, pH, turbidity and water depth should be collected by equipment with the characteristics and functions listed in the following sections. Other relevant data should also be recorded, including monitoring location/position, time, tidal stages, weather conditions and any special phenomena or work underway at the construction site.

A sample data record sheet is shown in **Appendix B** for reference.

The following equipments and facilities should be provided by the ET and used for the monitoring of water quality impacts.

4.1.2.2 Dissolved Oxygen and Temperature Measuring Equipment

DO and water temperature should be measured in-situ by a DO/ temperature meter. The instrument should be portable and weatherproof using a DC power source. It should have a membrane electrode with automatic temperature compensation complete with a cable. The equipment should be capable of measuring:

- a DO level in the range of 0-20 mg/l and 0-200% saturation; and

- a temperature of between 0 and 45 degree Celsius.

4.1.2.3 pH Measuring Instrument

A portable pH meter capable of measuring a range between 0.0 and 14.0 should be provided to measure pH under the specified conditions accordingly to the Standard Methods, APHA.

4.1.2.4 Turbidity Measurement Instrument

The instrument should be portable and weatherproof using a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0-1000 NTU.

4.1.2.5 Water Depth Detector

A portable, battery-operated echo sounder should be used for the measurement of water depth at each designated monitoring station. The unit would be either handheld or affixed to the bottom of the work boat, if the same vessel is to be used throughout the monitoring programme.

4.1.2.6 Calibration of In-Situ Instruments

All in-situ monitoring instruments should be calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme before use, and subsequently re-calibrated at 3-month intervals throughout all stages of the water quality monitoring programme. Responses of sensors and electrodes should be checked with certified standard solutions before each use.

Wet bulb calibration for a DO probe should be carried out before measurement at each monitoring station. A zero check in distilled water should be performed with the turbidity probe at least once per monitoring day. The probe should then be calibrated with a solution of known NTU. In addition, the turbidity probe should be calibrated at least twice per month to establish the relationship between turbidity readings (in NTU) and levels of suspended solids (in mg/L).

For the on-site calibration of field equipment, the BS 127: 1993, Guide to Field and On-Site Test Methods for the Analysis of Waters should be observed.

Sufficient stocks of spare parts should be maintained for replacements when necessary. Backup monitoring equipment should also be made available so that monitoring could proceed uninterrupted even when some equipment is under maintenance, calibration etc.

4.1.2.7 Sample Containers and Storage for Suspended Solids Measurement

A water sampler comprises a transparent PVC cylinder, with a capacity of not less than 2 litres, and could be effectively sealed with latex cups at both ends should be used. The sampler should have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth (Kahlsico Water Sampler or an approved similar instrument).

Water samples for SS analysis should be stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4^{o}C without being frozen), delivered to the laboratory, and analysed as soon as possible after collection.

4.1.2.8 Laboratory Measurement/Analysis

Analysis of suspended solids should be carried out in a HOKLAS or other accredited laboratory. Water samples of about 1L should be collected at the monitoring stations for carrying out the laboratory suspended solids determination. The SS determination work should start within 24 hours after collection of the water samples. The SS analyses should follow the standard method APHA 2540D with a detection limit of 1mg/L as described in APHA Standard Methods for the Examination of Water and Wastewater, 21st Edition, unless otherwise specified.

If in-house or non-standard methods are proposed, details of the method verification should, if required, be submitted to EPD. In any circumstances, the sample testing should have comprehensive quality assurance and quality control programmes. The laboratory should be prepared to demonstrate the quality control programmes to EPD or their representative if and when required.

Additional duplicate samples may be required by EPD for inter laboratory calibration. Remaining samples after analysis should be kept by the laboratory for 3 months in case repeat analysis is required. If in-house or non-standard methods are proposed, details of the method verification may also be required to submit to EPD. In any circumstance, the sample testing should have comprehensive quality assurance and quality control programmes. The laboratory should prepare to demonstrate the programmes to EPD or his representatives when requested.

4.1.3 Monitoring Locations

It is proposed to monitor the water quality at six locations close to the marine construction works. Three control stations, within the same water body but is outside the area of influence of the construction works as far as practicable, are proposed to be monitored. The locations of the proposed stations are shown in **Figure 4.1**. The final locations and number of the monitoring points should be agreed with EPD at least 2 weeks before undertaking any works. The status and locations of water sensitive receivers may change after issuing this Manual. If such case exists, the ET Leader should propose updated monitoring locations and seek approval from the IEC and EPD.

Table 4.1: Construction Water Quality Monitoring Stations

Station ID	Descriptions	Co-ordinates	
		Easting (m)	Northing (m)
WM1	Possible Pier 1	834656	817884
WM2	Landing steps	834422	817809
WM3	Landing steps	834320	817700
WM4	Landing steps	833901	817829
WM5	Possible Pier 2	833893	818074
WM6	Kowloon South Salt Water Pumping Station Intake	833992	818268
Control1	Control station for WM1, WM2 & WM3	834822	817696
Control2	Control station for WM1 to WM5	833939	817670
Control3	Control station for WM4 & WM5	833795	818115

4.1.4 Baseline Monitoring

The purpose of the baseline monitoring is to establish ambient conditions prior to the commencement of marine construction works and to demonstrate the suitability of the proposed monitoring stations. The measurements should be taken at all designated monitoring stations, 3 days per week, for at least 4 consecutive weeks prior to the commencement of marine construction works.

Two consecutive measurements of DO concentration (mg/L), DO saturation (%) and turbidity (NTU) should be taken in-situ according to the stated sampling method. Where the difference in value between the first and second measurement of DO or turbidity parameters is more than 25% of the value of the first reading, the reading should be discarded and further readings should be taken. Water samples for SS (mg/L) measurements should be collected at the same depths.

There should not be any construction activities over water in the vicinity of the points during baseline monitoring.

The interval between two sets of monitoring should not be less than 36 hours.

4.1.5 Impact Monitoring

During the course of marine construction works, impact monitoring should be undertaken at all designated monitoring stations, including the control stations, three days per week, with sampling/measurement. The interval between two sets of monitoring should not be less than 36 hours except when the Action and/or Limit levels is/are exceeded, in which case the monitoring frequency should be increased.

Two consecutive measurements of DO concentration (mg/L), DO saturation (%) and turbidity (NTU) should be taken in-situ according to the stated sampling method. Where the difference in value between the first and second measurement of DO or turbidity parameters is more than 25% of the value of the first reading, the reading should be discarded and further readings would be taken. Water samples for SS (mg/L) measurements should be collected at the same depths. Duplicate water samples should be taken and analysed.

In addition to the above in-situ measurements, water temperature and pH should be determined at all designated monitoring stations at the same depths, as specified above. Note that in addition to the water depth, monitoring location/position, time, weather conditions and any special phenomena should be recorded (refer to **Appendix B**).

4.1.6 Post-Construction Monitoring

Upon completion of all marine construction works, a post project water quality monitoring exercise should be carried out for four weeks upon completion of all marine construction works, in the same manner as the impact monitoring during construction phase.

4.1.7 Audit Requirements

Implementation of regular site audits (at least once per week) is to ensure that the recommended mitigation measures are to be properly undertaken during construction phase of the Project. It can also provide an effective control of any malpractices and therefore achieve continual improvement of environmental performance on site.

4.1.8 Event and Action Plan for Water Quality

The Action and Limit (AL) Levels for water quality are defined in **Table 4.2**. The actions in accordance with the Event and Action Plan in **Table 4.3** should be carried out if the water quality assessment criteria are exceeded at any designated monitoring points.

Table 4.2: Typical Action and Limit Levels for Water Quality

Parameters	Action Level	Limit Level
DO in mg/L	5 percentile of baseline data for surface, middle layer and bottom layer	4mg/L or 1 percentile of baseline data for surface and middle layer 2mg/L or 1 percentile of baseline data for bottom layer
SS in mg/L	95 percentile of baseline data or 120% of upstream control station's SS at the same tide of the same day[4]	99 percentile of baseline data or 130% of upstream control station's SS at the same tide of the same day[5]
Turbidity in NTU	95 percentile of baseline data or 120% of upstream control station's turbidity at the same tide of the same day	99 percentile of baseline data or 130% of upstream control station's turbidity at the same tide of the same day

Notes:
1. For DO measurement, non-compliance occurs when monitoring result is lower than the limits.
2. For SS and turbidity, non-compliance of water quality results when monitoring results is higher than the limits.
3. All the figures given in the table are used for reference only and the EPD may amend the figures whenever necessary.
4. The action level of SS for WM6 (Kowloon South Salt Water Pumping Station Intake) should be 95 percentile of baseline data or 120% of upstream control station's SS at the same tide of the same day or 10mg/L.
5. The limit level of SS for WM6 (Kowloon South Salt Water Pumping Station Intake) should be 99 percentile of baseline data or 130% of upstream control station's SS at the same tide of the same day or 10mg/L.

Table 4.3: Event and Action Plan for Water Quality for Construction Phase

Event	Action			
	ET	IEC	WKCDA	Contractor
Action level being exceed by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the WKCDA accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the WKCDA and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and WKCDA; 6. Implement the agreed mitigation measures.
Action level being exceeded by more than one consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Ensure mitigation measures are implemented; 7. Prepare to increase the monitoring frequency to daily; 8. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the WKCDA accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the WKCDA and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and WKCDA within 3 working days; 6. Implement the agreed mitigation measures.
Limit level being exceed by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor;	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the WKCDA	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working	1. Inform the WKCDA and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and

Event	Action			
	ET	IEC	WKCDA	Contractor
	4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level.	accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures.	equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and WKCDA; 6. Implement the agreed mitigation measures.
Limit level being exceeded by more than one consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the WKCDA accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures; 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit Level.	1. Inform the WKCDA and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET, IEC and WKCDA and propose mitigation measures to IEC and WKCDA within 3 working days; 6. Implement the agreed mitigation measures; 7. As directed by the WKCDA, to slow down or to stop all or part of the construction activities.

4.1.9 Mitigation Measures

The implementation schedule of the recommended water quality mitigation measures is presented in **Appendix C**.

4.2 Operational Water Quality Monitoring

Monitoring for the spent cooling water discharge from District Cooling System (DCS) during operation phase should follow the requirements as specified in the discharge license to be issued under the Water

Pollution Control Ordinance (WPCO). Details of monitoring including the locations, parameters, method of monitoring should be referred to the discharge license to be issued under the WPCO.

5. Sewerage and Sewage Treatment Implications

5.1 Construction Phase Monitoring

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

5.2 Operation Phase Monitoring

With the implementation of the proposed sewerage system according to the specifications and guidelines stated in Section 6 of the EIA report, no sewerage or sewage treatment implications are anticipated. No specific sewerage monitoring programme is thus required for the WKCD Development.

6. Waste Management Implications

6.1 Construction Phase Monitoring

6.1.1 Monitoring Requirements

The Contractor is responsible for waste management activities during the construction phase. The Contractor must ensure that all wastes produced during the construction phase are handled, stored and disposed of in accordance with EPD's regulations and requirements and in line with good waste management practices. A Waste Management Plan should be prepared and implemented in accordance with ETWB TC (W) No. 19/2005 Environmental Management on Construction Site.

During construction phase, regular site inspection (at least once per week) as part of the EM&A procedures should be carried out to determine if wastes are being managed in accordance with approved procedures and the Waste Management Plan. Waste materials generated during the construction works, such as Construction and Demolition (C&D) material, general refuse and chemical wastes, are recommended to be monitored on a weekly basis to ensure that proper storage, transportation and disposal practices are being implemented. This monitoring of waste management practices will ensure that these solid and liquid wastes are not disposed into the nearby harbour waters. The Contractor would be responsible for the implementation of any mitigation measures to minimise waste or redress problems arising from the waste materials.

6.1.2 Audit Requirements

It is recommended that the waste generated during the construction activities should be audited periodically (at least once per week) to determine if wastes are being managed in accordance with approved procedures and the site Waste Management Plan. The audits should look at all aspects of waste management including waste generation, storage, transport and disposal. An appropriate audit programme would be to undertake a first audit near the commencement of the construction works, and then to audit periodically thereafter. In addition, the routine site inspections should check the implementation of the recommended good site practices and other waste management mitigation measures.

A summary of all key types of waste arising and the reuse and disposal methods proposed during the construction phase of the Project is presented in **Table 6.1**.

6.1.3 Mitigation Measures

The implementation schedule of the recommended waste management mitigation measures is presented in **Appendix C**.

6.2 Operation Phase Monitoring

The key waste types generated during the operation phase will include general refuse from the Core Arts and Cultural Facilities (CACF) and Other Arts and Cultural Facilities (OACF) operation, residential, office, hotel, retail and restaurant activities; as well as chemical waste from regular servicing and maintenance activities for different electrical and mechanical equipment. Provided that all these wastes are handled, transported and disposed of in strict accordance with the relevant legislative requirements and the

recommended mitigation measures are properly implemented, no adverse environmental impact is expected during the operation phase. Therefore, no specific waste monitoring is required.

Table 6.1: Summary of Waste Arising during Construction Phase

Waste Type	Key Sources of Waste Generation	Timing of Waste Generation	Estimated Quantity of Waste Generation	Waste Reuse or Disposal	Waste Handling
Inert C&D Materials	Majority from excavation work for the WKCD basement (including the underpass road and the flyover); and minority from construction of superstructures and substructures (Note: Excavation of marine sediments is not anticipated)	Tentatively from 2013 to 2020	About 1,910,200 m^3 in total	About 156,400 m^3 to be reused on-site as fill materials for the Park About 905,000 m^3 to be reused by two potential projects, viz., HZMB project and 3rd runway project. Remaining quantity of about 848,800 m^3 to be disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong (subject to endorsement by the relevant authorities including PFC of CEDD and EPD) (Note: During the detailed design stage, further alternative disposal arrangement, e.g., other potential projects that could receive inert C&D materials from the WKCD Project, shall be continuously explored and identified. If no potential projects could receive the surplus inert C&D materials, the remaining inert C&D materials could be disposed of at the Government's Public Fill Reception Facilities (PFRFs) for beneficial use by any other projects in Hong Kong. No construction work is allowed to proceed until the issues on management of C&D materials have been resolved and all relevant arrangements have been endorsed by the relevant authorities (i.e. CEDD and EPD).)	Segregate inert C&D materials to avoid contamination from other waste arising
C&D Materials from Site Clearance	General site clearance	Tentatively from 2013 to 2017	About 108,300 m^3 in total	Any inert materials segregated from the C&D materials to be reused on-site as far as practicable or disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong Non-inert materials segregated from the C&D materials to be disposed of at the designated landfill sites	Segregate on site the C&D materials into inert and non-inert materials
General Refuse	Waste paper, discarded containers, etc. generated from the site workforce	Tentatively from 2013 to 2020 (completion of Phase 1) and beyond	0.65 kg per worker per day, the maximum daily arising of general refuse during the construction period would be approximately 975 kg	Refuse station for compaction and containerisation and then to landfill for disposal	Provide on-site refuse collection points

Waste Type	Key Sources of Waste Generation	Timing of Waste Generation	Estimated Quantity of Waste Generation	Waste Reuse or Disposal	Waste Handling
Chemical Waste	Used solvents, contaminated rags, waste lubricating oil, etc., from maintenance and servicing of construction plant and equipment	Tentatively from 2013 to 2020 (completion of Phase 1) and beyond	Few cubic metres per month (preliminary estimate)	Disposal of at the Chemical Waste Treatment Centre or other licensed recycling facilities	Stored on-site by suitably designed containers for off-site disposal or recycling

7. Land Contamination

7.1 Construction Phase Monitoring

In view of the desktop review results and the site inspection findings, bulk excavation of soil for land remediation is not expected at this stage. As such, any environmental monitoring in relation to land remediation is not required, unless a need for land remediation is identified during the future site investigation for the Tsim Sha Tsui Fire Station area. Since the TST Fire Station will remain in operation during the period between now and 2020, and leakage or spillage from the underground fuel oil tanks or pipes, or during refilling might occur. Therefore, further site visit and site investigation/laboratory chemical analysis are suggested to be conducted after land acquisition so that the investigation results will be up to date.

During construction phase, Environmental Monitoring and Audit (EM&A) should be carried out in the form of regular site inspection. All related procedures and facilities for handling or storage of chemicals and chemical wastes should be audited regularly to make sure they are in order and intact and reported in the EM&A reports as such.

7.2 Operation Phase Monitoring

The planned land uses within WKCD will mainly include arts and cultural facilities, public open space, commercial establishments, retails, hotels and residential developments. There will be no industrial activities taking place at the Project area during operation phase. Therefore, no contaminated land issue is anticipated. Monitoring programme during operational phase is considered not necessary.

8. Ecological Impact

Since no specific ecological mitigation measure is required, environmental monitoring and audit activities for ecology are not required.

9. Landscape and Visual Impact

9.1 Introduction

In addition to ensuring the effective implementation of mitigation measures recommended in **Section 10.7** of the EIA report and compliance with relevant environmental standards, this section proposes systematic procedures for monitoring the anticipated landscape and visual impacts and implementation of proposed mitigation measures.

9.2 Baseline Monitoring

The baseline monitoring aims to establish a baseline that collects information on the current site characteristics prior to the development in order to:

- Make comparisons between pre-development and post-development;
- Detect changes; and
- Make comparisons against a standard.

Baseline studies on landscape and visual amenity of the site and its surroundings have been provided in **Section 10.4** of the EIA report which documents the existing environmental conditions prior to the development. A one-off survey shall be undertaken to update and record the baseline conditions with photographs prior to the commencement of construction works.

9.3 Mitigation Measures

9.3.1 Mitigation Measures for Construction Phase Impacts

Mitigation measures are proposed in the EIA report to minimise the landscape and visual impacts during the construction phase. **Tables 9.1** and **9.2** summarise these proposed mitigation measures for landscape and visual impacts respectively.

Table 9.1: Landscape mitigation measures during construction phase

Ref. No.	Mitigation Measures during Construction Phase	Funding Agency	Implementation Agency	Management/ Maintenance Agency
CM1	Trees should be retained in situ on site as far as possible. Should tree removal be unavoidable due to construction impacts, trees will be transplanted or felled with reference to the stated criteria in the Tree Removal Applications to be submitted to relevant government departments for approval in accordance to ETWB TCW No. 29/2004 and 3/2006.	WKCDA	Contractor	WKCDA or appointed landscape contractor
CM2	Compensatory tree planting shall be incorporated to the proposed project and maximise the new tree, shrubs and other vegetation planting to compensate tree felled and vegetation removed. Also, implementation of compensatory planting should be of a ratio not less than 1:1 in terms of quality and quantity within the site.	WKCDA	Contractor	WKCDA or appointed landscape contractor
CM3	Buffer trees for screening purposes to soften the hard architectural and engineering structures and facilities.	Same as above	Contractor	WKCDA or appointed landscape contractor

Ref. No.	Mitigation Measures during Construction Phase	Funding Agency	Implementation Agency	Management/ Maintenance Agency
CM4	Softscape treatments such as vertical green wall panel /planting of climbing and/or weeping plants, etc, to maximize the green coverage and soften the hard architectural and engineering structures and facilities.	Same as above	Detailed Design Consultant/ Contractor	WKCDA or appointed landscape contractor
CM5	Roof greening by means of intensive and extensive green roof to maximize the green coverage and improve aesthetic appeal and visual quality of the building/structure.	Same as above	Detailed Design Consultant/ Contractor	WKCDA or appointed landscape contractor
CM6	Sensitive streetscape design should be incorporated along all new roads and streets.	Same as above	Detailed Design Consultant/ Contractor	WKCDA or appointed landscape contractor
CM7	Structure, ornamental planting shall be provided along amenity strips to enhance the landscape quality.	Same as above	Contractor	WKCDA or appointed landscape contractor
CM8	Landscape design shall be incorporated to architectural and engineering structures in order to provide aesthetically pleasing designs.	Same as above	Detailed Design Consultant / Contractor	WKCDA or appointed landscape contractor
CM9	Minimize the structure of marine facilities to built on the seabed and foreshore in order to minimize the affected extent to the waterbody	Same as above	Detailed Design Consultant / Contractor	WKCDA or appointed landscape contractor

Table 9.2: Visual mitigation measures during construction phase

	Mitigation Measure	Target VSRs	Funding Agency	Implementation Agency	Management/ Maintenance Agency
MCP1	Use of decorative screen hoarding / boards	Mostly the VSRs located in proximity to the WKCD site and the transient VSRs VSR 1, VSR 2, VSR 3, VSR 8, VSR 9, VSR10,VSR 11, VSR 12, VSR 15, VSR 16, VSR 17, VSR 18, VSR 20, VSR 21, VSR 24, VSR 29, VSR 33, VSR 34, VSR 35, VSR 40, VSR 41& VSR 42	WKCDA	Contractor	Contractor
MCP2	The early introduction of landscape treatments	All VSRs except VSR 5, VSR 6, VSR 7, VSR 13, VSR 14, VSR 22, VSR 23, VSR 32, VSR 33, VSR 34,VSR 35, VSR 36, VSR 37, VSR 38, VSR 39 & VSR 43	WKCDA	Contractor	WKCDA or appointed landscape contractor
MCP3	During the transition period, the temporary ventilation shafts for the basement will adopt a light colour	All VSRs except VSR 5, VSR 6, VSR 7, VSR 14,VSR 19, VSR 20, VSR 34, VSR 35, VSR 36 & VSR 39	WKCDA	Design Architect / Contractor	WKCDA
MCP4	Control of night time lighting.	Mostly the nearby residential VSRs VSR 8, VSR 9, VSR 10, VSR 11, VSR 12, VSR 14, VSR 16, VSR 18, VSR 20, VSR 21, VSR 22, VSR 25 & VSR 28	WKCDA	Contractor	Contractor

	Mitigation Measure	Target VSRs	Funding Agency	Implementation Agency	Management/ Maintenance Agency
MCP5	The use of greenery such as grass cover for the temporary landscaped areas during transition period will help achieve the visual balance and reduce the visual impacts	Mostly the VSRs located to the south and in proximityof the WKCD site, and across the Harbour VSR 1, VSR 2, VSR 3, VSR 4, VSR 8, VSR 9, VSR 10, VSR 11, VSR 12, VSR 16, VSR 17, VSR 18, VSR 20, VSR 21, VSR 25, VSR 26 & VSR 28	WKCDA	Contractor	WKCDA or appointed landscape contractor

9.3.2 Mitigation Measures for Operation Phase Impacts

Mitigation measures to minimise the landscape and visual impacts during the operation phase are proposed in the EIA report. **Tables 9.3** and **9.4** summarise these proposed mitigation measures for landscape and visual impacts respectively.

Table 9.3: Landscape mitigation measures during operation phase

Ref. No.	Mitigation Measures during Operation Phase	Funding Agency	Implementation Agency	Management/ Maintenance Agency
OM1	Provide proper planting establishment works, including watering, pruning, weeding, pest control, replacement of dead plant, etc, on the new planting areas to enhance the aesthetic design degree	WKCDA	Contractor	WKCDA or appointed landscape contractor
OM2	Provision of open space in various forms and at different levels on or above ground, including park, waterfront promenade, piazzas and terrace garden and associated green connections for public enjoyment.	WKCDA	Detailed Design Consultant / Contractor	WKCDA or appointed landscape contractor

Table 9.4: Visual mitigation measures during operation phase

	Mitigation Measure	Target VSRs	Funding Agency	Implementation Agency	Management / Maintenance Agency
Good Design Feature					
GDF1	**Control of Development Heights and Massing and Distinctive Architectural Design)** With well designed low to medium-rise buildings, the proposed WKCD development is anticipated to be highly compatible with the surroundings.	Mostly the VSRs located to the south and the southeast of the site, across the Harbour and in proximity VSR 1, VSR 2, VSR 3, VSR 4, VSR 24, VSR 25, VSR 26, VSR 27, VSR 28, VSR 29, VSR 30,VSR 31, VSR 40.	WKCDA	Design Architect / Contractor	WKCDA / developer of individual buildings
GDF2	**Creation of View Corridor** The buildings on the WKCD are designed to allow visual permeability from the WKT to Victoria Harbour, which is achieved by alignment of the buildings on the WKCD.	VSRs located close to WKT VSR9, VSR 10, VSR 11, VSR 12, VSR 15, VSR 16 & VSR 41.	WKCDA	Design Architect	WKCDA

	Mitigation Measure	Target VSRs	Funding Agency	Implementation Agency	Management / Maintenance Agency
GDF3	**Preservation of Open Vista from the Heritage Sites** An open vista and green corridor from the heritage sites consisting of the declared monuments of St. Andrew's Church, former Kowloon British School (now Antiques and Monuments Office) and Hong Kong Observatory through Kowloon Park, and along the WKCD waterfront promenade towards the Victoria Harbour will be preserved.	VSR 37, VSR 38 & VSR 39.	WKCDA	Design Consultant / WKCDA	n/a
GDF4	**Provision of Open Space at Grade** The open space will be provided in various forms at grade in the WKCD, including piazzas, a landscaped waterfront promenade and various green spaces.	All VSRs except VSR 36, VSR 37, VSR 38, VSR 39 & VSR 43.	WKCDA	Design Architect / Contractor	WKCDA or appointed landscape contractor
GDF 5	**Provision of Terrace Gardens** As one of the requirements of the proposed WKCD development, the unique designed terrace gardens could be also considered as a good design feature to lessen the visual impacts and provide new visual resources when viewed from the VSRs at higher levels.	Mostly the VSRs located at the upper levels, e.g. VSR 4,VSR 8, VSR 10, VSR 11, VSR 12, VSR 16, VSR 18, VSR 20, VSR 21, VSR 24, VSR 25, VSR 26, VSR 27 & VSR 28.	WKCDA	Design Architect / Contractor	WKCDA or appointed landscape contractor / developer of individual buildings
Mitigation Measure					
MOP1	Undulating berms and the trees planted in the surroundings of the existing WHC and MTR ventilation buildings.	Mostly the VSRs located to the south, the southeast and the west of the site, e.g. VSR 1, VSR 2, VSR 3, VSR 4, VSR 8, VSR 10, VSR 24, VSR 25, VSR 26, VSR 27, VSR 28, VSR 29, VSR 30, VSR 31 & VSR 41.	WKCDA	Contractor	WKCDA or appointed landscape contractor
MOP2	Clusters of shade planting and appropriate landscaping are designed to provide a relaxing waterfront environment, soften the water edge and helps mitigate the visual impacts associated with the existing WHC and MTR ventilation buildings.	Mostly the VSRs located to the south and the west of the site, and those located across the harbour, e.g. VSR 1, VSR 2, VSR 3, VSR 4, VSR 24, VSR 25, VSR 26, VSR 27, VSR 28, VSR 29, VSR 30, VSR 31 & VSR 40.	WKCDA	Landscape Architect / Contractor	WKCDA or appointed landscape contractor
MOP3	As provision of roof top gardens/green roof is not one	Mostly the VSRs located at the upper levels, e.g.	WKCDA	Design Architect / Contractor	WKCDA or appointed

	Mitigation Measure	Target VSRs	Funding Agency	Implementation Agency	Management / Maintenance Agency
	of the requirements of the WKCD development, they could be also considered as a mitigation measure to lessen the visual impacts and provide new visual resources when viewed from the VSRs at higher levels.	VSR 4,VSR 8, VSR 10, VSR 11, VSR 12, VSR 16, VSR 18, VSR 20, VSR 21, VSR 24, VSR 25, VSR 26, VSR 27 & VSR 28.			landscape contractor / developer of individual buildings
MOP4	Buffer trees for screening purposes or other softscape treatments such as vertical greening /climbers /roof top garden shall be incorporated to soften the hard architectural and engineering structures and facilities.	All VSRs except VSR 36, VSR 43	WKCDA	Contractor	WKCDA or appointed landscape contractor
MOP5	Mitigation measures for wind turbines located along the waterfront include use of natural colour tones (e.g. green colour), to make them visually more compatible with the surroundings.	Mostly the VSRs located to the south and the west of the site (e.g. VSR 1, VSR 2, VSR 4, VSR 25, VSR 26, VSR 27 VSR 28, VSR 29, VSR 30, VSR 31 & VSR 40)	WKCDA	Design Architect / Contractor	WKCDA
MOP6	Appropriate positioning and angling of the solar panels to avoid significant visual impacts on the VSRs located at upper levels in close proximity.	VSRs located at upper levels in close proximity, e.g. VSR 9, VSR 10, VSR 11, VSR 12, VSR 16, VSR 18, VSR 20, VSR 21, VSR 25, VSR 26, VSR 27 & VSR 28.	WKCDA / developer of individual buildings	WKCDA / developer of individual buildings	WKCDA / developer of individual buildings
MOP7	Aesthetic design of roads and streetscapes	VSRs located to immediately to the north and east of the WKCD site eg. VSR 8, VSR 9, VSR10, VSR 11, VSR 12, VSR 15, VSR 16, VSR 17, VSR 18, VSR 20, VSR 21, VSR 33, VSR 34, VSR 35, VSR 36 and transient VSRs (ie VSR 41 & VSR 42)	WKCDA	Design Architect / Contractor	WKCDA or appointed landscape contractor
MOP8	Human scale design for the WKT Plaza and the Intersection of Canton Road and Austin Road West	VSRs located close to the WKT Plaza and the Intersection of Canton Road and Austin Road West VSR 9, VSR 11, VSR 15, VSR 16, VSR 17, VSR 18, VSR 20, VSR 21 and transient VSRs (ie VSR 41 & VSR 42)	WKCDA / MTRC	Design Architect / Contractor	WKCDA or appointed landscape contractor
MOP9	Night time lighting control measures such as the use of	Mostly the nearby residential VSRs, e.g. VSR	WKCDA	WKCDA / developer of	WKCDA / developer of

	Mitigation Measure	Target VSRs	Funding Agency	Implementation Agency	Management / Maintenance Agency
	sensors and timers could help reduce usage after hours.	8, VSR 9, VSR 10, VSR 11, VSR 12, VSR 16, VSR 18, VSR 21, VSR 22, VSR 25 & VSR 28		individual buildings	individual buildings

9.4 Environmental Monitoring and Audit Requirements

An Environmental Team (ET) should be employed by the WKCDA to undertake the EM&A works. The ET should include a Registered Landscape Architect (RLA), or capable person, as landscape auditor. The Independent Environmental Checker (IEC) will be engaged by the WKCDA to audit the works of the ET, who is responsible for reviewing the EM&A works performed by the ET, auditing the monitoring activities and results and reviewing proposals on mitigation measures submitted by the Contractor.

During the landscape and visual impact monitoring, any changes in relation to the landscape and visual amenity should be monitored with reference to the baseline conditions of the site. In addition, proposed mitigation measures as shown in **Tables 9.1** to **9.4** should be checked for proper implementation.

9.5 Monitoring Programs

The proposed monitoring program for landscape and visual impact is detailed in **Table 9.5**.

Table 9.5: Monitoring Program for Landscape and Visual Impact

Stage	Monitoring Task	Frequency	Report	Approval
Design	Design check by ET to make sure the design complies with the proposed mitigation measures in the EIA report.	Once at completion of Design Stage	ET to confirm that the design complies with the proposed mitigation measures in the EIA report.	WKCDA
Construction	Monitor implementation of proposed mitigation measures during the construction stage.	Bi-weekly	ET to report on Contractor's compliance	Counter-signed by IEC
Operation	Monitor soft landscape works during the 12-month establishment period after construction completes.	Monthly	ET to report on Contractor's compliance	Counter-signed by IEC

9.6 Event and Action Plan

In case of non-compliance of landscape and visual impacts, procedures in accordance with the action plan as shown in **Table 9.6** should be followed.

Table 9.6: Event and Action Plan for Landscape and Visual Impact

Event/ Action	Action			
	ET	IEC	WKCDA	Contractor
Design Check	1. Design check to make sure the design complies with all the proposed mitigation measures in the EIA report;	1. Check report submitted by ET; 2. Recommend remedial design if necessary.	1. Undertake remedial design if necessary.	

Event/ Action	Action			
	ET	IEC	WKCDA	Contractor
	2. Prepare and submit report.			
Non-conformity on one occasion	1. Identify source of non-conformity; 2. Report to IEC and WKCDA; 3. Discuss remedial actions with IEC, WKCDA and Contractor; 4. Monitor remedial actions until rectification has been completed.	1. Check and verify source of non-conformity; 2. Discuss remedial actions with ET and Contractor; 3. Advise WKCDA on effectiveness of proposed remedial actions; 4. Check implementation of remedial actions.	1. Notify Contractor; 2. Ensure remedial actions are properly implemented.	1. Amend working method as necessary; 2. Rectify damage and undertake necessary replacement and remedial actions.
Repeated non-conformity	1. Identify source of non-conformity; 2. Report to IEC and WKCDA; 3. Increase monitoring frequency; 4. Discuss remedial actions with IEC, WKCDA and Contractor; 5. Monitor remedial actions until rectification has been completed; 6. If non-conformity rectified, reduce monitoring frequency back to normal.	1. Check and verify source of non-conformity; 2. Check Contractor's working method; 3. Discuss remedial actions with ET and Contractor; 4. Advise WKCDA on effectiveness of proposed remedial actions; 5. Supervise implementation of remedial actions.	1. Notify Contractor; 2. Ensure remedial actions are properly implemented.	1. Amend working method as necessary; 2. Rectify damage and undertake necessary replacement and remedial actions.

10. EM&A on Underpass Road Serving the Planned WKCD

10.1 Introduction

This section details the specific EM&A requirements for Schedule 2 Designated Project "an underpass more than 100m in length under the built areas (Item A.9, Part I, Schedule 2)". The requirements, methodology, equipment, monitoring locations, criteria and protocols for the monitoring and audit for this Designated Project are presented. The Project organisation, environmental auditing and reporting requirements are stipulated in Chapters 1, 12 & 13 of this Manual respectively.

10.2 Project Description

10.2.1 Existing Site Conditions

The site for the underpass road is located within the proposed WKCD site as shown in **Figure 10.1**. The site is currently zoned as "West Kowloon Cultural District Development Plan Area" under the Approved South West Kowloon Outline Zoning Plan (No. S/K20/28) gazetted on 8 January 2013, and combined with the proposed WKCD basement, comprises approximately 15ha of land bordering the Jordan/Tsim Sha Tsui area. The site reserved for the underpass road is currently occupied by works sites, local roads, temporary storage / parking facilities, some existing infrastructure and utility facilities, the existing Tsim Sha Tsui Fire Station and the works site and temporary works areas for the Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link (XRL) project.

10.2.2 Project Components

The underpass road forms part of the infrastructure and supporting facilities for the WKCD development, in particular it is an integral part of the WKCD basement structure. The underpass road is located mainly on the WKCD Basement Level 1 (between 0.6mPD and 1.65 mPD), except at the vehicular access points where the underpass road connects to existing ground level roads adjacent to the WKCD site. There are three access points to the underpass road (shown in **Figure 10.1**), one at Lin Cheung Road underpass, one at the junction with the proposed WKCD Park drive (extension of Nga Cheung Road), and one at Canton Road. Due to the delayed relocation of the Tsim Sha Tsui Fire Station, the access point at Canton Road will not be constructed until after relocation of the Fire Station, and an interim access point will be provided at Austin Road West until the permanent access point at Canton Road is constructed, after which the interim access road will be closed off permanently. After entering WKCD, there will be a carriageway route along the centre of the basement at +0.6mPD which provides access to each building development. In addition, the access also connects the carpark, coach parking and loading/unloading areas inside the basement.

The proposed underpass road is approximately 1400m in length which is comprised of three distinct sections (shown in **Figure 10.1**).

Section I comprises the underpass road with approach ramps linking up the Canton Road / Interim Austin Road West entrance (at level +5mPD) and the central roundabout at the Lin Cheung Road entrance (at level +0.6mPD) is a 10.3m standard wide single 2 lane carriageway with service roads on either side for loading / unloading facilities. A full highway standard headroom of 5.1m is provided such that all vehicle

types can enter into the basement level. The central Lin Cheung Road roundabout is designed as a free flow roundabout with 30m inner radius. The roundabout will enable traffic from the Lin Cheung Road Access to go into the internal circulation system of WKCD without delay.

Section II (at level +0.6mPD) continues from Section I as a 6.75m standard dual 2 lane road east-west to an internal roundabout of 45m in diameter. Pick up/drop off lay-bys are provided along the basement driveway. This section has links to a service road running along the northern perimeter of the site, and access points to the carpark at Basement Level 2 (at level -5mPD).

Section III continues from the internal roundabout and routes south and then west before rising in level to clear the existing MTRC railway tunnels and connect to the Park Drive. This section is a 10.3m standard wide single 2 lane carriageway with lay-bys and servicing accesses. The west entrance will be connected to the new at-grade access road running along the outside perimeter of the portal of the Western Harbour Crossing which will connect to both the at-grade and elevated junctions of Austin Road West and Nga Cheung Road.

Vehicles accessing the district will mainly use the depressed junction at Austin Road West and Lin Cheung Road.

10.2.3 Tentative Construction Programme

It is targeted to commence construction of the critical elements of the WKCD in 2013 so as to commission the Phase 1 arts and cultural facilities in stages starting from 2014/2015. As construction of the underpass road is integrated with construction of the WKCD basement, the programme for this Schedule 2 Project is the same as that for Zones 1 to 3 shown in **Appendix A**.

10.3 Air Quality Impact

10.3.1 Construction Air Quality Monitoring

10.3.1.1 General

It is proposed to carry out environmental monitoring and audit during the construction phase of the proposed underpass roads within the WKCD site to check and ensure compliance with the relevant air quality standards by effective implementation of the recommended construction dust mitigation measures. Potential air quality impact arising from the construction works would mainly be due to excavation, foundation works, site formation and movement of mobile plant and vehicles on haul roads, as well as the operation of a concrete batching plant and barging facilities. During operation phase, no environmental monitoring and audit is considered necessary.

The objectives of the dust monitoring are:

- to identify the extent of dust impact during construction phase on sensitive receivers;
- to audit the compliance of the Contractor with regard to dust control, contract conditions and the relevant dust impact criteria;
- to determine the effectiveness of mitigation measures to control fugitive dust emission from activities during the construction phase;

- to recommend further mitigation measures if found to be necessary, and;
- to comply with Action and Limit Levels for air quality as defined in this Manual.

Details of the environmental monitoring and audit requirements during construction phase are presented below.

10.3.1.2 Air Quality Parameters

Monitoring and audit of the Total Suspended Particulate (TSP) levels during the construction phase should be carried out by the Environmental Team (ET) to ensure that any deteriorating air quality could be readily detected and timely actions taken to rectify the situation.

The TSP levels should be measured by following the standard method as set out in High Volume Method for Total Suspended Particulates, Part 50 Chapter 1 Appendix B, Title 40 of the Code of Federal Regulations of the USEPA (HVS method).

One-hour and 24-hour TSP levels should be measured to indicate the impacts of construction dust on air quality. Upon approval of the IEC, one-hour TSP levels can be measured by direct reading methods which are capable of producing comparable results as that by the HVS method, to indicate short event impacts.

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, other special phenomena and work progress of the concerned project area, etc should be recorded. A sample data record sheet is shown in **Appendix B**. The ET may develop a project specific record sheet to suit this EM&A programme.

10.3.1.3 Monitoring Equipment

High Volume Sampler (HVS) in compliance with the following specifications should be used for carrying out the one-hour or 24-hour TSP monitoring:

- 0.6 - 1.7 m^3/min (20 - 60 standard cubic feet per minute) adjustable flow range;
- equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operation;
- installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation;
- capable of providing a minimum exposed area of 406 cm^2 (63 in^2);
- flow control accuracy: +/- 2.5% deviation over 24-hr sampling period;
- incorporated with an electronic mass flow rate controller or other equivalent devices;
- equipped with a flow recorder for continuous monitoring;
- provided with a peaked roof inlet;
- incorporated with a manometer;
- able to hold and seal the filter paper to the sampler housing at horizontal position;
- easy to change the filter, and;
- capable of operating continuously for 24-hour period.

The ET is responsible for provision of the monitoring equipment. They should ensure that sufficient numbers of HVSs with an appropriate calibration kit are available for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. The HVSs should 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., should be clearly labelled.

Initial calibration of dust monitoring equipment should be conducted upon installation and thereafter at bi-monthly intervals. The transfer standard should be traceable to the internationally recognised primary standard and be calibrated annually. The concern parties such as Independent Environmental Checker (IEC) should 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 should be verified to be constant and be recorded in the data sheet, shown in **Appendix B**.

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

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

- the wind sensors should be installed 10 m above ground so that they are clear of obstructions or turbulence caused by buildings;
- the wind data should be captured by a data logger. The data should be downloaded for analysis at least once a month;
- the wind data monitoring equipment should be re-calibrated at least once every six months, and;
- wind direction should be divided into 16 sectors of 22.5 degrees each.

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

10.3.1.4 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, should be available for sample analysis, 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 should be approved by the WKCDA and the measurement procedures should be witnessed by the IEC. Any measurement performed by the laboratory should be demonstrated to the satisfaction of the WKCDA and IEC. IEC should regularly audit to the measurement performed by the laboratory to ensure the accuracy of measurement results. The ET Leader should provide the WKCDA with

one copy of the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B for his reference.

Filter paper of size 8" x 10" should be labelled before sampling. It should be a clean filter paper with no pinholes, and should 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 should be kept in a clean and tightly sealed plastic bag. The filter paper should 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 should be regularly calibrated against a traceable standard.

All collected samples should be kept in good condition for six months before disposal.

10.3.1.5 Monitoring Location

Five air quality monitoring locations are proposed and summarised in **Table 10.1** and shown in **Figure 10.2**, subject to approval from the premises landlord for dust monitoring equipment installation. The status and locations of dust sensitive receivers may change after issuing this report. If such cases exist, the ET should propose updated monitoring locations and seek agreement from EPD, and agreement from WKCDA and IEC before baseline monitoring commences.

Table 10.1: Construction Air Quality Monitoring Stations for Underpass Roads

ID	Description
AM1	International Commerce Centre
AM2	The Harbourside Tower 1
AM3	The Victoria Towers - Tower 1
AM4	Canton Road Government Primary School
AM5	Topside Developments at West Kowloon Terminus Site (Monitoring to start after completion of development in 2015, subject to the construction programme of XRL)

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

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

Monitoring equipment must be positioned, sited and orientated properly. The ET should agree with the WKCDA 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 should be noted:

- a horizontal platform with appropriate support to secure the samplers against strong wind should be provided;
- no two samplers should be placed less than two meters apart;
- the distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler;

- a minimum of two meters of separation from walls, parapets and penthouses is required for rooftop samplers;
- a minimum of two meters separation from any supporting structure, measured horizontally is required;
- no furnace or incinerator flue is nearby;
- airflow around the sampler is unrestricted;
- the sampler is more than 20 meters from the dripline;
- wire fence or gates used to protect the sampler, should not cause any obstruction during monitoring;
- permission must be obtained to set up the samplers and to obtain access to the monitoring stations, and;
- a secured supply of electricity is needed to operate the samplers.

The ET may, depending on site conditions and monitoring results, decide whether additional monitoring locations should be included or any monitoring locations could be removed / relocated during any stage of the construction phase.

10.3.1.6 Baseline Monitoring

The ET should carry out baseline monitoring at least 14 consecutive days before commencement of construction work to obtain daily ambient 24-hour TSP samples. The selected baseline monitoring stations should reflect baseline conditions at the stations. One-hour sampling should also be done at least three times per day when the highest dust impacts are expected. The baseline monitoring will provide data for the determination of the appropriate Action Levels with the Limit Levels set against statutory or otherwise agreed limits. General meteorological conditions (wind speed, wind direction and precipitation) and notes regarding any significant adjacent dust producing sources should also be recorded throughout the baseline monitoring period.

During the baseline monitoring, there should not be any construction or dust generating activities in the vicinity of the monitoring stations. Before commencing baseline monitoring, the ET should inform the IEC of the baseline monitoring programme such that 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 during the baseline monitoring period, the ET leader should carry out the monitoring at alternative locations that can effectively represent the baseline conditions at the impact monitoring locations. The alternative baseline monitoring locations should be approved by the WKCDA and agreed with the IEC.

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

Ambient conditions may vary seasonally and should be reviewed once every six months. When the ambient conditions have changed and a repeat of the baseline monitoring is required to be carried out for obtaining the updated baseline levels; the monitoring should be at times when the Contractor's activities

are not generating dust, at least in the proximity of the monitoring stations. Should change in ambient conditions be determined, the baseline levels and, in turn, the air quality criteria, should be revised. The revised baseline levels and air quality criteria should be agreed with the IEC and EPD.

10.3.1.7 Impact and Compliance Monitoring

The monthly schedule of the compliance and impact monitoring programme should be drawn up by the ET one month prior to the commencement of the scheduled construction period

The ET should carry out impact monitoring at all the proposed monitoring stations, except AM5, throughout the entire construction work period. The impact monitoring at AM5 will be started after completion of the XRL project. For regular impact monitoring, the sampling frequency of at least once in every six days, should be strictly observed at all the monitoring stations for 24-hour TSP monitoring. For one-hour TSP monitoring, the sampling frequency of at least three times in every six days should be undertaken when the highest dust impact occurs. Before commencing baseline monitoring, the ET should inform the IEC of the impact monitoring programme. The IEC can carry out on-site audit to ensure accuracy of the impact monitoring results.

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

In case of non-compliance with the air quality criteria, more frequent monitoring, as specified in the Action Plan, should be conducted within 24 hours after the result is obtained. This additional monitoring should be continued until the excessive dust emission or the deterioration in air quality is rectified and agreed with WKCDA and the IEC.

10.3.1.8 Audit Requirements

Audit of the TSP levels should be carried out by the ET to ensure that any deteriorating air quality could be readily detected and timely action taken to rectify the situation.

10.3.1.9 Event and Action Plan for Air Quality

Baseline monitoring results form the basis for determining the air quality criteria for the impact monitoring. The ET should compare the impact monitoring results with air quality criteria set up for 24-hour TSP and one-hour TSP level. Air quality criteria which name Action and Limit (AL) Levels to be used are shown in **Table 10.2**, AL are to be agreed between the ET, IEC and WKCDA prior to air monitoring commencement. Event and Action Plan (**Table 10.3**) list the action should be carried out when non-compliance of the air quality criteria occurs.

Table 10.2: Typical Action and Limit Level for Air Quality

Parameter	Action Level	Limit Level
24-hr TSP Level in $\mu g/m^3$	For baseline level ≤ 200 $\mu g/m^3$, Action level = (130% of baseline level + Limit level)/2 For baseline level > 200 $\mu g/m^3$, Action level = Limit Level	260
1-hr TSP Level in $\mu g/m^3$	For baseline level ≤ 384 $\mu g/m^3$, Action level = (130% of baseline level + Limit level)/2 For baseline level > 384 $\mu g/m^3$, Action level = Limit Level	500

Table 10.3: Typical Event and Action Plan for Air Quality

Event	ET	IEC	WKCDA	Contractor
Action Level				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and WKCDA; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and WKCDA; 3. Advise the WKCDA on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and WKCDA; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to WKCDA within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
Limit Level				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform WKCDA, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the WKCDA on the effectiveness of the proposed remedial measures; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.

Event	ET	IEC	WKCDA	Contractor
2. Exceedance for two or more consecutive samples	1. Notify IEC, WKCDA, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and WKCDA to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the WKCDA until the exceedance is abated.

10.3.1.10 Mitigation Measures

Appropriate dust suppression measures should be adopted as required under the relevant requirements stipulated in the *Air Pollution Control (Construction Dust) Regulation* and EPD's *Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)* as well as the good practices for dust control should be implemented to reduce the dust impact. A control programme can be instigated to monitor the construction process in order to enforce dust controls and modify methods of works where feasible to reduce the dust emission down to acceptable levels. The implementation schedule of recommended air quality mitigation measures is presented in **Appendix D**.

10.3.2 Operational Air Quality Monitoring

With the full implementation of the recommended mitigation measures during operation phase, no residual impacts due to vehicle and marine emissions are anticipated. Operational phase air quality monitoring is not considered necessary.

10.4 Noise Impact

10.4.1 Construction Airborne Noise Monitoring

10.4.1.1 Monitoring Requirements

The construction noise level should be measured in terms of the A-weighted equivalent continuous sound pressure level (Leq). Leq (30 minutes) should be used as the monitoring parameter between 0700 and 1900 hours on normal weekdays. For all other time periods, Leq (5 minutes) should be employed for comparison with the Noise Control Ordinance (NCO) criteria.

Supplementary information for data auditing, statistical results such as L10 and L90 should also be obtained for reference.

10.4.1.2 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 should be used for carrying out the noise monitoring. Immediately prior to and following each noise measurement the accuracy of the sound level meter should be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration level from before and after the noise measurement agree to within 1.0 dB.

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

The ET is responsible for the provision of the monitoring equipment. He should 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 should be clearly labelled.

A sample data record sheet is shown in **Appendix B** for reference.

10.4.1.3 Monitoring Locations

The noise monitoring locations (refer to **Figure 10.3**) are summarised in **Table 10.4**. The status and locations of noise sensitive receivers may change after issuing this manual. If such cases exist, the ET should propose updated monitoring locations and seek agreement from EPD, the WKCDA and the IEC before baseline monitoring commences.

Table 10.4: Construction Noise Monitoring Stations for Underpass Roads

ID	ID adopted in Construction Noise Assessment	Description
NM1	HT1	The Harbourside Tower 1
NM2	AST	The Arch - Sun Tower
NM3	VT1	The Victoria Towers - Tower 1
NM4	CRGPS	Canton Road Government Primary School
NM5	RD	Development next to Austin Station (Monitoring to start after completion of development in 2015, subject to the construction programme of the Project)

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

- monitoring at sensitive receivers close to the major site activities which are likely to have noise impacts;
- monitoring at the noise sensitive receivers as defined in the Technical Memorandum; and

- assurance of minimal disturbance to the occupants during monitoring.

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

10.4.1.4 Baseline Monitoring

The ET should carry out baseline noise monitoring prior to the commencement of the construction works. The baseline monitoring should be carried out daily for a period of at least two weeks. Before commencing the baseline monitoring, the ET should develop and submit to the IEC the baseline monitoring programme such that the IEC can conduct on-site audit to check accuracy of the baseline monitoring results.

There should not be any construction activities in the vicinity of the stations during the baseline monitoring.

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

10.4.1.5 Impact Monitoring

Noise monitoring should be carried out at all the designated monitoring stations, except NM5, throughout the entire construction work period. The impact monitoring at NM5 will be started after completion of the XRL project. The monitoring frequency should depend on the scale of the construction activities. The following is an initial guide on the regular monitoring frequency for each station on a weekly basis when noise generating activities are underway:

- one set of measurements between 0700 and 1900 hours on normal weekdays

If construction works are extended to include works during the hours of 1900 – 0700 as well as public holidays and Sundays, additional weekly impact monitoring should be carried out during respective restricted hours periods. Applicable permits under NCO should also be obtained by the Contractor.

If a school exists near the construction activity, noise monitoring should be carried out at the monitoring stations for the schools during the school examination periods. The ET Leader should liaise with the school's personnel and the Examination Authority 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 in **Table 10.6**, should be carried out. This additional monitoring should be continued until the recorded noise levels are rectified or demonstrated to be unrelated to the construction activities.

10.4.1.6 Event and Action Plan

The Action and Limit (AL) Levels for construction noise are defined in **Table 10.5**. Should non-compliance of the criteria occur, action in accordance with the Event and Action Plan in **Table 10.6** should be carried out.

Table 10.5: Action and Limit Level for Construction Noise

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

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

Table 10.6: Event and Action Plan for Construction Noise

Event	Action			
	ET	IEC	WKCDA	Contractor
Action Level	1. Notify WKCDA, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, WKCDA and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the WKCDA accordingly; 3. Advise the WKCDA on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures.	1. Submit noise mitigation proposals to IEC and WKCDA; 2. Implement noise mitigation proposals.
Limit Level	1. Inform IEC, WKCDA, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and WKCDA on remedial measures required; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC and WKCDA within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; 5. Stop the relevant portion of works as instructed by the WKCDA until the exceedance is abated.

10.4.1.7 Mitigation Measures

Recommended construction noise control and mitigation measures are proposed in the EIA report. The Contractor should be responsible for the design and implementation of these measures under the supervision of the ER and monitored by the ET. The implementation schedule of the recommended noise mitigation measures is presented in **Appendix D**.

10.4.2 Operational Noise Monitoring

10.4.2.1 Traffic Noise Monitoring

With implementation of the proposed mitigation measures, no adverse traffic noise impacts are anticipated from the operation of the Project, hence no environmental monitoring and audit is proposed.

10.4.2.2 Fixed Plant Noise Monitoring

Maximum Permissible Sound Power Levels of Fixed Plant

The maximum permissible sound power levels of the identified fixed noise sources of the Project were predicted in the EIA report. The specified sound power levels should be implemented and refined by the Contractor as appropriate to ensure that the noise impact associated with the fixed plant operations would comply with the noise standards stipulated in the EIAO-TM and NCO.

Commissioning Test

Prior to the operation of the Project, the Contractor should conduct noise commissioning tests for all major fixed noise sources within WKCD. The test should be carried out by a qualified person possessing at least 7 years of noise control experience and a corporate membership of Hong Kong Institute of Acoustics or equivalent. The noise commissioning test report should be submitted to the ET Leader,IEC and WKCDA for approval.

10.4.2.3 Mitigation Measures

The relevant noise mitigation measures have been recommended in the EIA Report. The implementation schedule of the mitigation measures are given in **Appendix D**.

10.5 Water Quality Impact

10.5.1 Construction Phase Monitoring

Adverse water quality impact was not predicted during the construction phase of the proposed underpass road. Nevertheless, appropriate mitigation measures are recommended to minimize potential water quality impacts.

Regular audit of the implementation of the recommended mitigation measures during the construction phase at the work areas should also be undertaken to ensure the recommended mitigation measures are properly implemented. Proposed mitigation measures for containing and minimizing water quality impacts are listed in the implementation schedule given in **Appendix D**.

10.5.2 Operation Phase Monitoring

With the implementation of the recommended mitigation measures during operational phase, no adverse water quality impact is anticipated. Operational phase water quality monitoring is therefore not considered necessary.

10.6 Sewerage and Sewage Treatment Implication

The underpass road is part of a network of infrastructure within the WKCD development to meet the connectivity and accessibility requirements of the WKCD. This underpass roads do not require or generate any sewage or sewerage related facilities. Consequently, there are no sewerage and sewage treatment implications associated with the underpass road. Therefore, environmental monitoring and audit activities are not required.

10.7 Waste Management Implications

10.7.1 Construction Phase Monitoring

10.7.1.1 Monitoring Requirements

The Contractor is responsible for waste management activities during the construction phase. The Contractor must ensure that all wastes produced during the construction phase are handled, stored and disposed of in accordance with EPD's regulations and requirements and in line with good waste management practices. A Waste Management Plan should be prepared and implemented in accordance with ETWB TC (W) No. 19/2005 Environmental Management on Construction Site.

During construction phase, regular site inspection (at least once per week) as part of the EM&A procedures should be carried out to determine if wastes are being managed in accordance with approved procedures and the Waste Management Plan. Waste materials generated during the construction works, such as Construction and Demolition (C&D) material, general refuse and chemical wastes, are recommended to be monitored on a weekly basis to ensure that proper storage, transportation and disposal practices are being implemented. This monitoring of waste management practices will ensure that these solid and liquid wastes are not disposed into the nearby harbour waters. The Contractor would be responsible for the implementation of any mitigation measures to minimise waste or redress problems arising from the waste materials.

10.7.2 Audit Requirements

It is recommended that the waste generated during the construction activities should be audited periodically (at least once per week) to determine if wastes are being managed in accordance with approved procedures and the site Waste Management Plan. The audits should look at all aspects of waste management including waste generation, storage, transport and disposal. An appropriate audit programme would be to undertake a first audit near the commencement of the construction works, and then to audit periodically thereafter. In addition, the routine site inspections should check the implementation of the recommended good site practices and other waste management mitigation measures.

A summary of all key types of waste arising and the reuse and disposal methods proposed during the construction phase of the Project is presented in **Table 10.7**.

10.7.3 Mitigation Measures

The implementation schedule of the recommended waste management mitigation measures is presented in **Appendix D**.

10.7.4 Operation Phase Monitoring

During operation phase, the underpass roads will not involve any waste generating activities. Therefore, no adverse waste management impact is anticipated during operation phase and hence, no specific waste monitoring is required.

Table 10.7: Summary of Waste Arising during Construction Phase

Waste Type	Key Sources of Waste Generation	Timing of Waste Generation	Estimated Quantity of Waste Generation	Waste Reuse or Disposal	Waste Handling
Inert C&D Materials	Majority from excavation work for the WKCD (including the underpass road and the flyover) basement; and minority from construction of superstructures and substructures (Note: Excavation of marine sediments is not anticipated)	Tentatively from 2013 to 2017	About 1,882,830 m^3 in total	About 147,740 m^3 to be reused on-site as fill materials for the Park About 905,000 m^3 to be reused by two potential projects, viz., HZMB project and 3rd runway project. Remaining quantity of about 831,090 m^3 to be disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong (subject to endorsement by the relevant authorities including PFC of CEDD and EPD) (Note: During the detailed design stage, further alternative disposal arrangement, e.g., other potential projects that could receive inert C&D materials from the WKCD Project, shall be continuously explored and identified. If no potential projects could receive the surplus inert C&D materials, the remaining inert C&D materials could be disposed of at the Government's Public Fill Reception Facilities (PFRFs) for beneficial use by any other projects in Hong Kong. No construction work is allowed to proceed until the issues on management of C&D materials have been resolved and all relevant arrangements have been endorsed by the relevant authorities (i.e. CEDD and EPD).)	Segregate inert C&D material to avoid contamination from other waste arising
C&D Materials from Site Clearance	General site clearance	Tentatively from 2013 to 2017	About 108,300 m^3 in total	Any inert materials segregated from the C&D materials to be reused on-site as far as practicable or disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong Non-inert materials segregated from the C&D materials to be disposed of at the designated landfill sites	Segregate on site the C&D materials into inert and non-inert materials

Waste Type	Key Sources of Waste Generation	Timing of Waste Generation	Estimated Quantity of Waste Generation	Waste Reuse or Disposal	Waste Handling
General Refuse	Waste paper, discarded containers, etc. generated from the site workforce	Tentatively from 2013 to 2017	0.65 kg per worker per day, the maximum daily arising of general refuse during the construction period would be approximately 975 kg	Refuse station for compaction and containerisation and then to landfill for disposal	Provide on-site refuse collection points
Chemical Waste	Used solvents, contaminated rags, waste lubricating oil, etc., from maintenance and servicing of construction plant and equipment	Tentatively from 2013 to 2017	Few cubic metres per month (preliminary estimate)	Disposal of at the Chemical Waste Treatment Centre or other licensed recycling facilities	Stored on-site by suitably designed containers for off-site disposal or recycling

10.8 Land Contamination

10.8.1 Construction Phase Monitoring

In view of the desktop review results and the site inspection findings, bulk excavation of soil for land remediation is not expected at this stage. As such, any environmental monitoring in relation to land remediation is not required, unless a need for land remediation is identified during the future site investigation for the Tsim Sha Tsui Fire Station area. Since the TST Fire Station will remain in operation during the period between now and 2020, and leakage or spillage from the underground fuel oil tanks or pipes, or during refilling might occur. Therefore, further site visit and site investigation/laboratory chemical analysis are suggested to be conducted after land acquisition so that the investigation results will be up to date.

During construction phase, Environmental Monitoring and Audit (EM&A) should be carried out in the form of regular site inspection. All related procedures and facilities for handling or storage of chemicals and chemical wastes should be audited regularly to make sure they are in order and intact and reported in the EM&A reports as such.

10.8.2 Operation Phase Monitoring

During operation phase, the underpass road will be used as an access for vehicles moving to and from the WKCD site and its associated facilities. There will be no industrial activities taking place at the Project area during operation phase. Therefore, no contaminated land issue is anticipated and hence, no specific monitoring is required.

10.9 Ecological Impact

Since no significant ecological impact will arise from the proposed underpass roads, no specific ecological monitoring programme is thus required for the underpass roads.

10.10 Landscape and Visual Impact

10.10.1 Introduction

In addition to ensuring the effective implementation of mitigation measures recommended in **Section 14.10** of the EIA report and compliance with relevant environmental standards, this section proposes systematic procedures for monitoring, auditing and minimizing the environmental impacts associated with the construction works and operation.

10.10.2 Baseline Conditions

10.10.2.1 Baseline Monitoring

The baseline monitoring aims to establish a baseline that collects information on the current site characteristics prior to the development in order to:

- Make comparisons between different pre-development and post development;

- Detect changes; and
- Make comparisons against a standard.

Baseline studies on landscape and visual amenity of the site and its surroundings have been provided in **Section 14.10.4** of the EIA report which documents the existing environmental conditions prior to the development. A one-off survey shall be undertaken to update and record the baseline conditions with photographs prior to the commencement of construction works.

10.10.3 Mitigation Measures

10.10.3.1 Mitigation Measures for Construction Phase Impacts

Mitigation measures are proposed in the EIA report to minimize the landscape and visual impacts during the construction phase. **Tables 10.8** and **10.9** summarize these proposed mitigation measures for landscape and visual impacts respectively.

Table 10.8: Landscape mitigation measures during construction phase

Ref. No.	Mitigation Measures during Construction Phase	Funding Agency	Implementation Agency	Management/ Maintenance Agency
CM1	Trees should be retained in situ on site as far as possible. Should tree removal be unavoidable due to construction impacts, trees will be transplanted or felled with reference to the stated criteria in the Tree Removal Applications to be submitted to relevant government departments for approval in accordance to ETWB TCW No. 29/2004 and 3/2006.	WKCDA -for works area within WKCD site CEDD - for works area of external connections Private Developer -for works area within private land sale lots	Contractor	Appointed landscape contractor
CM2	Compensatory tree planting shall be incorporated to the proposed project and maximize the new tree, shrubs and other vegetation planting to compensate tree felled and vegetation removed. Also, implementation of compensatory planting should be of a ratio not less than 1:1 in terms of quality and quantity within the site.	Same as above	Contractor	Appointed landscape contractor
CM3	Buffer trees for screening purposes to soften the hard architectural and engineering structures and facilities.	Same as above	Contractor	WKCDA or appointed landscape contractor
CM4	Softscape treatments such as vertical green wall panel /planting of climbing and/or weeping plants, etc, to maximize the green coverage and soften the hard architectural and engineering structures and facilities.	Same as above	Detailed Design Consultant/ Contractor	WKCDA or appointed landscape contractor
CM5	Roof greening by means of intensive and extensive green roof to maximize the green coverage and improve aesthetic appeal and visual quality of the building/structure.	Same as above	Detailed Design Consultant/ Contractor	WKCDA or appointed landscape contractor
CM6	Sensitive streetscape design should be incorporated along all new roads and streets.	Same as above	Detailed Design Consultant/ Contractor	WKCDA or appointed landscape contractor
CM7	Structure, ornamental planting shall be provided along amenity strips to enhance the landscape	Same as above	Contractor	WKCDA or appointed

Ref. No.	Mitigation Measures during Construction Phase	Funding Agency	Implementation Agency	Management/ Maintenance Agency
	quality.			landscape contractor
CM8	Landscape design shall be incorporated to architectural and engineering structures in order to provide aesthetically pleasing designs.	Same as above	Detailed Design Consultant / Contractor	WKCDA or appointed landscape contractor

Table 10.9: Visual mitigation measures during construction phase

	Mitigation Measures	Target VSRs	Funding Agency	Implementation Agency	Management/ Maintenance Agency
MMC1	Use of decorative screen hoarding/ boards	All of the VSRs	WKCDA – for works area within WKCD site CEDD – for works area of external connection	Contractor	Contractor
MMC2	During the transition period, the temporary ventilation shafts for the basement associated with the underpass road will adopt light colour	All of the VSRs	WKCDA	Design Architect / Contractor	WKCDA
MMC3	The early introduction of landscape treatments	All of the VSRs	WKCDA	Contractor	Contractor
MMC4	The temporary landscaped areas will help achieve the visual balance	All of the VSRs	WKCDA	Contractor	WKCDA
MMC5	Control of night time lighting such as avoidance of lighting from spilling onto nearby residential developments	Residential VSR (ie. VSR 3)	WKCDA – for works area within WKCD site	Contractor	Contractor

10.10.3.2 Mitigation Measures for Operation Phase Impacts

Mitigation measures to minimize the landscape and visual impacts during the operation phase are proposed in the EIA report. **Tables 10.10** and **10.11** summarize these proposed mitigation measures for landscape and visual impacts respectively.

Table 10.10: Landscape mitigation measures during operation phase

Ref. No.	Mitigation Measures during Operation Phase	Funding Agency	Implementation Agency	Management/ Maintenance Agency
OM1	Provide proper planting maintenance on the new planting areas to enhance the aesthetic design degree	WKCDA -for work area within WKCD site CEDD- for work areas of external connections Private Developer -for	Contractor	LCSD -for public roadside and pedestrian footbridge planting[1]

Ref. No.	Mitigation Measures during Operation Phase	Funding Agency	Implementation Agency	Management/ Maintenance Agency
		works areas within private land sale lots		Private Developers -for all landscaping within the private land sale lots WKCDA -for all other areas within WKCD
OM2	Provision of open space in various forms and at different levels on or above ground, including park, waterfront promenade, piazzas and terrace garden and associated green connections for public enjoyment.	WKCDA	Detailed Design Consultant / Contractor	WKCDA or appointed landscape contractor

[1] in accordance with ETWB No. 2/2004

Table 10.11: Visual mitigation measures during operation phase

	Mitigation Measures	Target VSRs	Funding Agency	Implementation Agency	Management/ Maintenance Agency
MMO1	Adoption of light colour for the temporary ventilation shafts associated with the underpass road during operation phase (day 1)	All of the VSRs	WKCDA	Design Architect/ Contractor	WKCDA/ developer of Individual Buildings
MMO2	The temporary landscape areas will help achieve the visual balance during operation phase (Day 1)	All of the VSRs	WKCDA	Contractor	WKCDA
MMO3	Use of planter and other softscape treatments during operation phase (Day 1)	All of the VSRs	WKCDA	Contractor	Contractor
MMO4	Use of decorative screen hoarding/boards. during operation phase (day 1)	All of the VSRs	WKCDA – for works area within WKCD site CEDD – for works area of external connection	Contractor	Contractor
MMO5	Aesthetic design of roads and roadside planting during operation phase (year 10)	VSRs abutting the entrance of the underground roads VSR 2 (The Elements) and VSR 7 (Austin Station)	WKCDA	Contractor	Contractor
MMO6	Control of night time lighting such as avoidance of lighting	Residential VSR (i.e. VSR 3)	WKCDA – for works area within WKCD site	Contractor	Contractor

Mitigation Measures	Target VSRs	Funding Agency	Implementation Agency	Management/ Maintenance Agency
from spilling onto nearby residential developments during operation phase (day 1 and year 10)				

10.10.4 Environmental Monitoring and Audit Requirements

An Environmental Team (ET) should be employed by the WKCDA to undertake the EM&A works. The ET should include a Registered Landscape Architect (RLA), or capable person, as landscape auditor. The Independent Environmental Checker (IEC) will be engaged by the WKCDA to audit the works of the ET, who is responsible for reviewing the EM&A works performed by the ET, auditing the monitoring activities and results and reviewing proposals on mitigation measures submitted by the Contractor.

During the landscape and visual impact monitoring, any changes in relation to the landscape and visual amenity should be monitored with reference to the baseline conditions of the site. In addition, proposed mitigation measures as shown in **Tables 10.8** to **10.11** should be checked for proper implementation.

10.10.5 Monitoring Programs

The proposed monitoring program for landscape and visual impact is detailed in **Table 10.12**.

Table 10.12: Monitoring Program for Landscape and Visual Impact

Stage	Monitoring Task	Frequency	Report	Approval
Design	Design check by ET to make sure the design complies with the proposed mitigation measures in the EIA report.	Once at completion of Design Stage	ET to confirm that the design complies with the proposed mitigation measures in the EIA report.	WKCDA
Construction	Monitor implementation of proposed mitigation measures during the construction stage.	Bi-weekly	ET to report on Contractor's compliance	Counter-signed by IEC
Operation	Monitor soft landscape works during the 12-month establishment period after construction completes.	Monthly	ET to report on Contractor's compliance	Counter-signed by IEC

10.10.6 Event and Action Plan

In case of non-compliance of landscape and visual impacts, procedures in accordance with the action plan as shown in **Table 10.13** should be followed.

Table 10.13: Event and Action Plan for Landscape and Visual Impact

Event/ Action	Action			
	ET	IEC	WKCDA	Contractor
Design Check	1. Design check to make sure the design complies with all the proposed mitigation measures in the EIA report;	1. Check report submitted by ET; 2. Recommend remedial design if necessary.	1. Undertake remedial design if necessary.	

Event/ Action	Action			
	ET	IEC	WKCDA	Contractor
	2. Prepare and submit report.			
Non-conformity on one occasion	1. Identify source of non-conformity; 2. Report to IEC and WKCDA; 3. Discuss remedial actions with IEC, WKCDA and Contractor; 4. Monitor remedial actions until rectification has been completed.	1. Check and verify source of non-conformity; 2. Discuss remedial actions with ET and Contractor; 3. Advise WKCDA on effectiveness of proposed remedial actions; 4. Check implementation of remedial actions.	1. Notify Contractor; 2. Ensure remedial actions are properly implemented.	1. Amend working method as necessary; 2. Rectify damage and undertake necessary replacement and remedial actions.
Repeated non-conformity	1. Identify source of non-conformity; 2. Report to IEC and WKCDA; 3. Increase monitoring frequency; 4. Discuss remedial actions with IEC, WKCDA and Contractor; 5. Monitor remedial actions until rectification has been completed; 6. If non-conformity rectified, reduce monitoring frequency back to normal.	1. Check and verify source of non-conformity; 2. Check Contractor's working method; 3. Discuss remedial actions with ET and Contractor; 4. Advise WKCDA on effectiveness of proposed remedial actions; 5. Supervise implementation of remedial actions.	1. Notify Contractor; 2. Ensure remedial actions are properly implemented.	1. Amend working method as necessary; 2. Rectify damage and undertake necessary replacement and remedial actions.

11. EM&A on Austin Road Flyover Serving the Planned WKCD

11.1 Introduction

This section details the specific EM&A requirements for Schedule 2 Designated Project "a flyover more than 100m in length between abutments over the Western Harbour Crossing toll plaza (Item A.8, Part I, Schedule 2)". The requirements, methodology, equipment, monitoring locations, criteria and protocols for the monitoring and audit for this Designated Project are presented. The Project organisation, environmental auditing and reporting requirements are stipulated in Chapters 1, 12 & 13 of this Manual respectively.

11.2 Project Description

11.2.1 Existing Site Conditions

The site for the Austin Road flyover is located outside the proposed WKCD site as shown in **Figure 11.1**. The site is currently occupied mainly by the Western Harbour Crossing (WHC) and its toll plaza, and part of the existing West Kowloon Waterfront Promenade on either side of the WHC.

11.2.2 Project Components

This Schedule 2 Project is for extension of the existing elevated deck at the junction of Austin Road West / Nga Cheung Road to the New Yau Ma Tei Public Cargo Working Area (NYMTPCWA) via a flyover above the WHC toll plaza at +14.0mPD. Its aim is to provide a second access for the Mega Performance Venue and Exhibition Centre, and flexibility for event management. The flyover will also enhance the accessibility and robustness of the arrangements including post event traffic dispersal for serving the MPV and second emergency vehicle route. The flyover starts at the elevated junction of Austin Road West / Nga Cheung Road, spanning across the WHC toll plaza westward, turns southward and lands at the northwest corner of WKCD area adjacent to the NYMTPCWA area. This will provide an alternative return loop for the road access running along the outside perimeter of the portal of the WHC which connects with the roundabout at the junction of Nga Cheung Road and Austin Road West at ground level.

The proposed flyover will be a single two-lane two-way elevated highways structure supported by four piers (which had already been constructed under two previous projects as explained in Section 15.2.4 of the EIA Report); and its approach ramps span between piers and conventional abutments. The abutments will be located at the two ends of the bridge deck. The flyover is about 200m long and 7.3m width with 1m marginal strip at each side.

A new approach ramp adjacent to the existing WHC administration building is also proposed to connect with the elevated roundabout junction of Austin Road West / Nga Cheung Road. The new ramp will be constructed from the elevated roundabout junction to join at +5.0mPD of the new at-grade carriageway and the carriageway at WKCD Basement B1 level. Additional piers and abutments will be constructed for the ramps of the flyover. Existing facilities on top of the WHC toll plaza which conflicts with the flyover structures will need to be rearranged, and utilities at the piers and abutments of the flyover will also need to be diverted.

11.2.3 Tentative Construction Programme

The flyover is a supplementary component of the WKCD development project, proposed mainly to support certain WKCD facilities. Implementation of this Schedule 2 Project is subject to factors such as funding and associated arrangements, as well as interface with and restrictions imposed by the operators of the existing WHC tunnel entrance and toll plaza. Despite such factors and restrictions, it is tentatively scheduled to complete construction of this flyover by 2017 (see **Appendix A**).

11.3 Air Quality Impact

11.3.1 Construction Air Quality Monitoring

11.3.1.1 General

It is proposed to carry out environmental monitoring and audit during the construction phase of the proposed Austin Road flyover to check and ensure compliance with the relevant air quality standards by effective implementation of the recommended construction dust mitigation measures. Potential air quality impact arising from the construction works would mainly be due to excavation, foundation works, site formation, movement of mobile plant and vehicles on haul roads, as well as the operation of a concrete batching plant and barging facilities. During operation phase, no environmental monitoring and audit is considered necessary.

Although there are some exceedances of AQOs because of air quality impacts due to vehicle emissions these are considered to be adequately dealt with through the proposed mitigation measures. No significant residual operational impacts are anticipated.

The objectives of the dust monitoring are:

- to identify the extent of dust impact during construction phase on sensitive receivers;
- to audit the compliance of the Contractor with regard to dust control, contract conditions and the relevant dust impact criteria;
- to determine the effectiveness of mitigation measures to control fugitive dust emission from activities during the construction phase;
- to recommend further mitigation measures if found to be necessary, and;
- to comply with Action and Limit Levels for air quality as defined in this Manual.

Details of the environmental monitoring and audit requirements during construction phase are presented below.

11.3.1.2 Air Quality Parameters

Monitoring and audit of the Total Suspended Particulate (TSP) levels during the construction phase should be carried out by the Environmental Team (ET) to ensure that any deteriorating air quality could be readily detected and timely actions taken to rectify the situation.

The TSP levels should be measured by following the standard method as set out in High Volume Method for Total Suspended Particulates, Part 50 Chapter 1 Appendix B, Title 40 of the Code of Federal Regulations of the USEPA (HVS method).

One-hour and 24-hour TSP levels should be measured to indicate the impacts of construction dust on air quality. Upon approval of the IEC, one-hour TSP levels can be measured by direct reading methods which are capable of producing comparable results as that by the HVS method, to indicate short event impacts.

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, other special phenomena and work progress of the concerned project area, etc should be recorded. A sample data record sheet is shown in **Appendix B**. The ET may develop a project specific record sheet to suit this EM&A programme.

11.3.1.3 Monitoring Equipment

High Volume Sampler (HVS) in compliance with the following specifications should be used for carrying out the one-hour or 24-hour TSP monitoring:

- 0.6 - 1.7 m^3/min (20 - 60 standard cubic feet per minute) adjustable flow range;
- equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operation;
- installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation;
- capable of providing a minimum exposed area of 406 cm^2 (63 in^2);
- flow control accuracy: +/- 2.5% deviation over 24-hr sampling period;
- incorporated with an electronic mass flow rate controller or other equivalent devices;
- equipped with a flow recorder for continuous monitoring;
- provided with a peaked roof inlet;
- incorporated with a manometer;
- able to hold and seal the filter paper to the sampler housing at horizontal position;
- easy to change the filter, and;
- capable of operating continuously for 24-hour period.

The ET is responsible for provision of the monitoring equipment. They should ensure that sufficient numbers of HVSs with an appropriate calibration kit are available for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. The HVSs should 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., should be clearly labelled.

Initial calibration of dust monitoring equipment should be conducted upon installation and thereafter at bi-monthly intervals. The transfer standard should be traceable to the internationally recognised primary standard and be calibrated annually. The concern parties such as Independent Environmental Checker (IEC) should 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 should be verified to be constant and be recorded in the data sheet, shown in **Appendix B**.

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

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

- the wind sensors should be installed 10 m above ground so that they are clear of obstructions or turbulence caused by buildings;
- the wind data should be captured by a data logger. The data should be downloaded for analysis at least once a month;
- the wind data monitoring equipment should be re-calibrated at least once every six months, and;
- wind direction should be divided into 16 sectors of 22.5 degrees each.

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

11.3.1.4 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, should be available for sample analysis, 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 should be approved by the WKCDA and the measurement procedures should be witnessed by the IEC. Any measurement performed by the laboratory should be demonstrated to the satisfaction of the WKCDA and IEC. IEC should regularly audit to the measurement performed by the laboratory to ensure the accuracy of measurement results. The ET Leader should provide the WKCDA with one copy of the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B for his reference.

Filter paper of size 8" x 10" should be labelled before sampling. It should be a clean filter paper with no pinholes, and should 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 should be kept in a clean and tightly sealed plastic bag. The filter paper should 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 should be regularly calibrated against a traceable standard.

All collected samples should be kept in good condition for six months before disposal.

11.3.1.5 Monitoring Location

Two air quality monitoring locations are proposed and summarised in **Table 11.1** and shown in **Figure 11.2**, subject to approval from the premises landlord for dust monitoring equipment installation. The status and locations of dust sensitive receivers may change after issuing this report. If such cases exist, the ET should propose updated monitoring locations and seek agreement from EPD, and agreement from WKCDA and IEC before baseline monitoring commences.

Table 11.1: Construction Air Quality Monitoring Stations for the proposed Austin Road flyover

ID	Description
AM1	International Commerce Centre
AM2	Parcel 39 (Office + Planned Performance Art Venues within WKCD) (Monitoring to start after occupation of development in 2017, subject to the construction programme of the Project)

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

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

Monitoring equipment must be positioned, sited and orientated properly. The ET should agree with the WKCDA 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 should be noted:

- a horizontal platform with appropriate support to secure the samplers against strong wind should be provided;
- no two samplers should be placed less than two meters apart;
- the distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler;
- a minimum of two meters of separation from walls, parapets and penthouses is required for rooftop samplers;
- a minimum of two meters separation from any supporting structure, measured horizontally is required;
- no furnace or incinerator flue is nearby;
- airflow around the sampler is unrestricted;
- the sampler is more than 20 meters from the dripline;
- wire fence or gates used to protect the sampler, should not cause any obstruction during monitoring;
- permission must be obtained to set up the samplers and to obtain access to the monitoring stations, and;
- a secured supply of electricity is needed to operate the samplers.

The ET may, depending on site conditions and monitoring results, decide whether additional monitoring locations should be included or any monitoring locations could be removed / relocated during any stage of the construction phase.

11.3.1.6 Baseline Monitoring

The ET should carry out baseline monitoring at least 14 consecutive days before commencement of construction work to obtain daily ambient 24-hour TSP samples. The selected baseline monitoring stations should reflect baseline conditions at the stations. One-hour sampling should also be done at least three times per day when the highest dust impacts are expected. The baseline monitoring will provide data for the determination of the appropriate Action Levels with the Limit Levels set against statutory or otherwise agreed limits. General meteorological conditions (wind speed, wind direction and precipitation) and notes regarding any significant adjacent dust producing sources should also be recorded throughout the baseline monitoring period.

During the baseline monitoring, there should not be any construction or dust generating activities in the vicinity of the monitoring stations. Before commencing baseline monitoring, the ET should inform the IEC of the baseline monitoring programme such that 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 during the baseline monitoring period, the ET leader should carry out the monitoring at alternative locations that can effectively represent the baseline conditions at the impact monitoring locations. The alternative baseline monitoring locations should be approved by the WKCDA and agreed with the IEC.

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

Ambient conditions may vary seasonally and should be reviewed once every six months. When the ambient conditions have changed and a repeat of the baseline monitoring is required to be carried out for obtaining the updated baseline levels; the monitoring should be at times when the Contractor's activities are not generating dust, at least in the proximity of the monitoring stations. Should change in ambient conditions be determined, the baseline levels and, in turn, the air quality criteria, should be revised. The revised baseline levels and air quality criteria should be agreed with the IEC and EPD.

11.3.1.7 Impact and Compliance Monitoring

The monthly schedule of the compliance and impact monitoring programme should be drawn up by the ET one month prior to the commencement of the scheduled construction period

The ET should carry out impact monitoring at all the proposed monitoring stations, except AM2, throughout the entire construction work period. The impact monitoring at AM2 will be started after occupation of the development. For regular impact monitoring, the sampling frequency of at least once in every six days, should be strictly observed at all the monitoring stations for 24-hour TSP monitoring. For one-hour TSP monitoring, the sampling frequency of at least three times in every six days should be undertaken when the

highest dust impact occurs. Before commencing baseline monitoring, the ET should inform the IEC of the impact monitoring programme. The IEC can carry out on-site audit to ensure accuracy of the impact monitoring results.

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

In case of non-compliance with the air quality criteria, more frequent monitoring, as specified in the Action Plan, should be conducted within 24 hours after the result is obtained. This additional monitoring should be continued until the excessive dust emission or the deterioration in air quality is rectified and agreed with WKCDA and the IEC.

11.3.1.8 Audit Requirements

Audit of the TSP levels should be carried out by the ET to ensure that any deteriorating air quality could be readily detected and timely action taken to rectify the situation.

11.3.1.9 Event and Action Plan for Air Quality

Baseline monitoring results form the basis for determining the air quality criteria for the impact monitoring. The ET should compare the impact monitoring results with air quality criteria set up for 24-hour TSP and one-hour TSP level. Air quality criteria which name Action and Limit (AL) Levels to be used are shown in **Table 11.2**, AL are to be agreed between the ET, IEC and WKCDA prior to air monitoring commencement. Event and Action Plan (**Table 11.3**) list the action should be carried out when non-compliance of the air quality criteria occurs.

Table 11.2: Typical Action and Limit Level for Air Quality

Parameter	Action Level	Limit Level
24-hr TSP Level in $\mu g/m^3$	For baseline level ≤ 200 $\mu g/m^3$, Action level = (130% of baseline level + Limit level)/2 For baseline level > 200 $\mu g/m^3$, Action level = Limit Level	260
1-hr TSP Level in $\mu g/m^3$	For baseline level ≤ 384 $\mu g/m^3$, Action level = (130% of baseline level + Limit level)/2 For baseline level > 384 $\mu g/m^3$, Action level = Limit Level	500

Table 11.3: Typical Event and Action Plan for Air Quality

Event	ET	IEC	WKCDA	Contractor
Action Level				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and WKCDA; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and WKCDA; 3. Advise the WKCDA on the effectiveness of the	1. Check monitoring data submitted by ET; 2. Check Contractor's working method;	1. Confirm receipt of notification of failure in writing; 2. Notify	1. Submit proposals for remedial to WKCDA within

Event	ET	IEC	WKCDA	Contractor
	proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and WKCDA; 8. If exceedance stops, cease additional monitoring.	3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Monitor the implementation of remedial measures.	Contractor; 3. Ensure remedial measures properly implemented.	three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
Limit Level				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform WKCDA, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the WKCDA on the effectiveness of the proposed remedial measures; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	1. Notify IEC, WKCDA, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and WKCDA to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the WKCDA until the exceedance is abated.

11.3.1.10 Mitigation Measures

Appropriate dust suppression measures should be adopted as required under the relevant requirements stipulated in the *Air Pollution Control (Construction Dust) Regulation* and EPD's *Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)* as well as the good practices for dust control should be implemented to reduce the dust impact. A control programme can be instigated to monitor the construction process in order to enforce dust controls and modify methods of works where feasible to reduce the dust emission down to acceptable levels. The implementation schedule of recommended air quality mitigation measures is presented in **Appendix E**.

11.3.2 Operational Air Quality Monitoring

With the full implementation of the recommended mitigation measures during operation phase, no adverse air impact is anticipated. Operational phase air quality monitoring is not considered necessary.

11.4 Noise Impact

11.4.1 Construction Airborne Noise Monitoring

11.4.1.1 Monitoring Requirements

The construction noise level should be measured in terms of the A-weighted equivalent continuous sound pressure level (Leq). Leq (30 minutes) should be used as the monitoring parameter between 0700 and 1900 hours on normal weekdays. For all other time periods, Leq (5 minutes) should be employed for comparison with the Noise Control Ordinance (NCO) criteria.

Supplementary information for data auditing, statistical results such as L10 and L90 should also be obtained for reference.

11.4.1.2 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 should be used for carrying out the noise monitoring. Immediately prior to and following each noise measurement the accuracy of the sound level meter should be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration level from before and after the noise measurement agree to within 1.0 dB.

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

The ET is responsible for the provision of the monitoring equipment. He should 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 should be clearly labelled.

A sample data record sheet is shown in **Appendix B** for reference.

11.4.1.3 Monitoring Locations

The noise monitoring locations (refer to **Figure 11.3**) are summarised in **Table 11.4**. The status and locations of noise sensitive receivers may change after issuing this manual. If such cases exist, the ET should propose updated monitoring locations and seek agreement from EPD, the WKCDA and the IEC before baseline monitoring commences.

Table 11.4: Construction Noise Monitoring Stations

ID	ID adopted in Construction Noise Assessment	Description
NM1	HT3	The Harbourside Tower 3
NM2	P29	Parcel 29 in WKCD (Monitoring to start after occupation of development in 2019, subject to the construction programme of the Project)

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

- monitoring at sensitive receivers close to the major site activities which are likely to have noise impacts;
- monitoring at the noise sensitive receivers as defined in the Technical Memorandum; and
- assurance of minimal disturbance to the occupants during monitoring.

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

11.4.1.4 Baseline Monitoring

The ET should carry out baseline noise monitoring prior to the commencement of the construction works. The baseline monitoring should be carried out daily for a period of at least two weeks. Before commencing the baseline monitoring, the ET should develop and submit to the IEC the baseline monitoring programme such that the IEC can conduct on-site audit to check accuracy of the baseline monitoring results.

There should not be any construction activities in the vicinity of the stations during the baseline monitoring.

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

11.4.1.5 Impact Monitoring

Noise monitoring should be carried out at all the designated monitoring stations, except NM2, throughout the entire construction work period. The impact monitoring at NM2 will be started after occupation of the development. The monitoring frequency should depend on the scale of the construction activities. The following is an initial guide on the regular monitoring frequency for each station on a weekly basis when noise generating activities are underway:

- one set of measurements between 0700 and 1900 hours on normal weekdays

If construction works are extended to include works during the hours of 1900 – 0700 as well as public holidays and Sundays, additional weekly impact monitoring should be carried out during respective restricted hours periods. Applicable permits under NCO should also be obtained by the Contractor.

If a school exists near the construction activity, noise monitoring should be carried out at the monitoring stations for the schools during the school examination periods. The ET Leader should liaise with the school's personnel and the Examination Authority 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 in **Table 11.6**, should be carried out. This additional monitoring should be continued until the recorded noise levels are rectified or demonstrated to be unrelated to the construction activities.

11.4.2 Event and Action Plan

The Action and Limit (AL) Levels for construction noise are defined in **Table 11.5**. Should non-compliance of the criteria occur, action in accordance with the Event and Action Plan in **Table 11.6** should be carried out.

Table 11.5: Action and Limit Level for Construction Noise

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

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

Table 11.6: Event and Action Plan for Construction Noise

Event	ET	IEC	WKCDA	Action Contractor
Action Level	1. Notify WKCDA, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, WKCDA and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the WKCDA accordingly; 3. Advise the WKCDA on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures.	1. Submit noise mitigation proposals to IEC and WKCDA; 2. Implement noise mitigation proposals.

Event	ET	IEC	WKCDA	Action Contractor
Limit Level	1. Inform IEC, WKCDA, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and WKCDA on remedial measures required; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and WKCDA informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst WKCDA, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the WKCDA accordingly.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC and WKCDA within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; 5. Stop the relevant portion of works as instructed by the WKCDA until the exceedance is abated.

11.4.2.1 Operational Noise Monitoring

No monitoring is considered necessary.

11.4.2.2 Mitigation Measures

Recommended construction noise control and mitigation measures are proposed in the EIA report. The Contractor should be responsible for the design and implementation of these measures under the supervision of the ER and monitored by the ET. The implementation schedule of the recommended noise mitigation measures is presented in **Appendix E**.

11.5 Water Quality Impact

11.5.1 Construction Phase Monitoring

Adverse water quality impact was not predicted during the construction and operation phases of the proposed flyover. Nevertheless, appropriate mitigation measures are recommended to minimize potential water quality impacts.

Regular audit of the implementation of the recommended mitigation measures during the construction phase at the work areas should also be undertaken to ensure the recommended mitigation measures are properly implemented. Proposed mitigation measures for containing and minimizing water quality impacts are listed in the implementation schedule given in **Appendix E**.

11.5.2 Operation Phase Monitoring

With the implementation of the recommended mitigation measures during operational phase, no adverse water quality impact is anticipated. Operational phase water quality monitoring is therefore not considered necessary.

11.6 Sewerage and Sewage Treatment Implication

The flyover is part of a network of infrastructure within the WKCD development to meet the connectivity and accessibility requirements of the WKCD. The flyover does not require or generate any sewage or sewerage related facilities. Consequently, there are no sewerage and sewage treatment implications associated with the flyover. Therefore, environmental monitoring and audit activities are not required.

11.7 Waste Management Implication

11.7.1 Construction Phase Monitoring

11.7.1.1 Monitoring Requirements

The Contractor is responsible for waste management activities during the construction phase. The Contractor must ensure that all wastes produced during the construction phase are handled, stored and disposed of in accordance with EPD's regulations and requirements and in line with good waste management practices. A Waste Management Plan should be prepared and implemented in accordance with ETWB TC (W) No. 19/2005 Environmental Management on Construction Site.

During construction phase, regular site inspection (at least once per week) as part of the EM&A procedures should be carried out to determine if wastes are being managed in accordance with approved procedures and the Waste Management Plan. Waste materials generated during the construction works, such as Construction and Demolition (C&D) material, general refuse and chemical wastes, are recommended to be monitored on a weekly basis to ensure that proper storage, transportation and disposal practices are being implemented. This monitoring of waste management practices will ensure that these solid and liquid wastes are not disposed into the nearby harbour waters. The Contractor would be responsible for the implementation of any mitigation measures to minimise waste or redress problems arising from the waste materials.

11.7.1.2 Audit Requirements

It is recommended that the waste generated during the construction activities should be audited periodically (at least once per week) to determine if wastes are being managed in accordance with approved procedures and the site Waste Management Plan. The audits should look at all aspects of waste management including waste generation, storage, transport and disposal. An appropriate audit programme would be to undertake a first audit near the commencement of the construction works, and then to audit periodically thereafter. In addition, the routine site inspections should check the implementation of the recommended good site practices and other waste management mitigation measures.

A summary of all key types of waste arising and the reuse and disposal methods proposed during the construction phase of the Project is presented in **Table 11.7**.

11.7.1.3 Mitigation Measures

The implementation schedule of the recommended waste management mitigation measures is presented in **Appendix E**.

11.7.2 Operation Phase Monitoring

During operation phase, the proposed flyover will not involve any waste generating activities. Therefore, no adverse waste management impact is anticipated during operation phase and hence, no specific waste monitoring is required.

Table 11.7: Summary of Waste Arisings during Construction Phase

Waste Type	Key Sources of Waste Generation	Timing of Waste Generation	Estimated Quantity of Waste Generation	Waste Reuse or Disposal	Waste Handling
Inert C&D Materials	Minority from excavation at bridge piers and abutments, and from construction of the flyover superstructure	Tentatively from 2014 to 2017	Up to 3,000 m^3 in total	All inert C&D materials would be reused on-site as fill materials for the Park. In case of any surplus inert C&D materials, such materials may be disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong (subject to endorsement by the relevant authorities including PFC of CEDD and EPD)	Segregate inert C&D materials to avoid contamination from other waste arising
C&D Materials from Site Clearance	General site clearance	Tentatively from 2014 to 2017	About 600 m^3 in total	Any inert materials segregated from the C&D materials to be reused on-site as far as practicable or disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong Non-inert materials segregated from the C&D materials to be disposed of at the designated landfill sites	Segregate on site the C&D materials into inert and non-inert materials
General Refuse	Waste paper, discarded containers, etc. generated from the site workforce	Tentatively from 2014 to 2017	0.65 kg per worker per day, the maximum daily arising of general refuse during the construction period would be approximately 65 kg	Refuse station for compaction and containerisation and then to landfill for disposal	Provide on-site refuse collection points
Chemical Waste	Used solvents, contaminated rags, waste lubricating oil, etc., from maintenance and servicing of construction plant and equipment	Tentatively from 2014 to 2017	Less than one cubic metre per month (preliminary estimate)	Disposal of at the Chemical Waste Treatment Centre or other licensed recycling facilities	Stored on-site by suitably designed containers for off-site disposal or recycling

11.8 Land Contamination

Since no potential land contamination issues associated with the proposed flyover, therefore, environmental monitoring and audit activities are not required.

11.9 Ecological Impact

Since no specific ecological mitigation measure is required, therefore environmental monitoring and audit activities for ecology are not required.

11.10 Landscape and Visual Impact

11.10.1 Introduction

In addition to ensuring the effective implementation of mitigation measures recommended in **Section 15.10** of the EIA report and compliance with relevant environmental standards, this section proposes systematic procedures for monitoring, auditing and minimizing the anticipated landscape and visual impacts and implementation of proposed mitigation measures.

11.10.2 Baseline Monitoring

The baseline monitoring aims to establish a baseline that collects information on the current site characteristics prior to the development in order to:

- Make comparisons between different pre-development and post development;
- Detect changes; and
- Make comparisons against a standard.

Baseline studies on landscape and visual amenity of the site and its surroundings have been provided in **Section 15.10.4** of the EIA report which documents the existing environmental conditions prior to the development. A one-off survey should be undertaken to update and record the baseline conditions with photographs prior to the commencement of construction works.

11.10.3 Mitigation Measures

11.10.3.1 Mitigation Measures for Construction Phase Impacts

Mitigation measures are proposed in the EIA report to minimize the landscape and visual impacts during the construction phase. **Tables 11.8** and **11.9** summarize these proposed mitigation measures for landscape and visual impacts respectively.

Table 11.8: Landscape mitigation measures during construction phase

Ref. No.	Mitigation Measures during Construction Phase	Funding Agency	Implementation Agency	Management/ Maintenance Agency
CM1	Trees should be retained in situ on site as far as possible. Should tree removal be unavoidable due	WKCDA – for works area within WKCD site	Contractor	WKCDA or appointed

Ref. No.	Mitigation Measures during Construction Phase	Funding Agency	Implementation Agency	Management/ Maintenance Agency
	to construction impacts, trees will be transplanted or felled with reference to the stated criteria in the Tree Removal Applications to be submitted to relevant government departments for approval in accordance to ETWB TCW No. 29/2004 and 3/2006.	CEDD- for works area of external connections Private Developer – for works area within private land sale lots		landscape contractor
CM2	Compensatory tree planting shall be incorporated to the proposed project and maximize the new tree, shrubs and other vegetation planting to compensate tree felled and vegetation removed. Also, implementation of compensatory planting should be of a ratio not less than 1:1 in terms of quality and quantity within the site.	Same as above	Contractor	WKCDA or appointed landscape contractor
CM3	Buffer trees for screening purposes to soften the hard architectural and engineering structures and facilities.	Same as above	Contractor	WKCDA or appointed landscape contractor
CM4	Softscape treatments such as vertical green wall panel /planting of climbing and/or weeping plants, etc, to maximize the green coverage and soften the hard architectural and engineering structures and facilities.	Same as above	Detailed Design Consultant / Contractor	WKCDA or appointed landscape contractor
CM7	Structure, ornamental planting shall be provided along amenity strips to enhance the landscape quality.	Same as above	Contractor	WKCDA or appointed landscape contractor
CM8	Landscape design shall be incorporated to architectural and engineering structures in order to provide aesthetically pleasing designs.	Same as above	Detailed Design Consultant / Contractor	WKCDA or appointed landscape contractor

Table 11.9: Visual mitigation measures during construction phase

Mitigation Measures		Target VSRs	Funding Agency	Implementation Agency	Management/ Maintenance Agency
MMCP1	Use of decorative screen hoarding/ boards	All of the VSRs	WKCDA – for works area within WKCD site CEDD – for works area of external connections	Contractor	Contractor
MMCP2	Control of night time lighting such as avoidance of lighting from spilling onto nearby developments	Residential VSR (i.e. VSR 3)	WKCDA – for works area within WKCD site	Contractor	Contractor

11.10.3.2 Mitigation Measures for Operation Phase Impacts

Mitigation measures to minimize the landscape and visual impacts during the operation phase are proposed in the EIA report. **Tables 11.10** and **11.11** summarize these proposed mitigation measures for landscape and visual impacts respectively.

Table 11.10: Landscape mitigation measures during operation phase

Ref. No.	Mitigation Measures during Operation Phase	Funding Agency	Implementation Agency	Management/ Maintenance Agency
OM1	Provide proper planting establishment works, including watering, pruning, weeding, pest control, replacement of dead plant, etc, on the new planting areas to enhance the aesthetic design degree	WKCDA – for works area within WKCD site CEDD- for works area of external connections Private Developer – for works areas within private land sale lots	Contractor	LCSD – for public roadside and pedestrian footbridge planting[1] Private Developers – for all landscaping within the private land sale lots WKCDA – for all other areas within WKCD
OM2	Provision of open space in various forms and at different levels on or above ground, including park, waterfront promenade, piazzas and terrace garden and associated green connections for public enjoyment.	WKCDA	Detailed Design Consultant / Contractor	WKCDA or appointed landscape contractor

[1] in accordance with ETWB No. 2/2004

Table 11.11: Visual mitigation measures during operation phase

	Mitigation Measures	Target VSRs	Funding Agency	Implementation Agency	Management/ Maintenance Agency
MMOP1	Integrated design of the flyover with the existing flyover located to the west of the Elements	All VSRs	WKCDA – for works area within WKCD site CEDD – for works area of external connections	Contractor	n/a
MMOP2	Softscape treatments such as climber shall be incorporated to soften the hard engineering structures.	All VSRs	Same as above	Contractor	LCSD – for public roadside and pedestrian footbridge planting[1] WKCDA – for all other areas within WKCD
MMOP3	Compensatory planting in close proximity of the flyover structure	All VSRs	Same as above	Contractor	LCSD – for public roadside and pedestrian footbridge planting[1] WKCDA – for all other areas within WKCD
MMOP4	Ornamental planting shall be provided along amenity strips to enhance the landscape quality.	All VSRs	Same as above	Contractor	LCSD – for public roadside and pedestrian footbridge planting[1] WKCDA – for all other areas within WKCD
MMOP5	Control of night time lighting such as careful considerations	Residential VSR (i.e. VSR 3)	WKCDA – for works areas within WKCD site	Contractor	WKCDA / Contractor

	Mitigation Measures	Target VSRs	Funding Agency	Implementation Agency	Management/ Maintenance Agency
	for the locations and the angle of the lighting				

[1] in accordance with ETWB No. 2/2004

11.10.4 Environmental Monitoring and Audit Requirements

An Environmental Team (ET) should be employed by the WKCDA to undertake the EM&A works. The ET should include a Registered Landscape Architect (RLA), or capable person, as landscape auditor. The Independent Environmental Checker (IEC) will be engaged by the WKCDA to audit the work of the ET, who is responsible for reviewing the EM&A works performed by the ET, auditing the monitoring activities and results and reviewing proposals on mitigation measures submitted by the Contractor.

During the landscape and visual impact monitoring, any changes in relation to the landscape and visual amenity should be monitored with reference to the baseline conditions of the site. In addition, proposed mitigation measures as shown in **Tables 11.8** to **11.11** should be checked for proper implementation.

11.10.5 Monitoring Programs

The proposed monitoring program for landscape and visual impact is detailed in **Table 11.12**.

Table 11.12: Monitoring Program for Landscape and Visual Impact

Stage	Monitoring Task	Frequency	Report	Approval
Design	Design check by ET to make sure the design complies with the proposed mitigation measures in the EIA report.	Once at completion of Design Stage	ET to confirm that the design complies with the proposed mitigation measures in the EIA report.	WKCDA
Construction	Monitor implementation of proposed mitigation measures during the construction stage.	Bi-weekly	ET to report on Contractor's compliance	Counter-signed by IEC
Operation	Monitor soft landscape works during the 12-month establishment period after construction completes.	Monthly	ET to report on Contractor's compliance	Counter-signed by IEC

11.10.6 Event and Action Plan

In case of non-compliance of landscape and visual impacts, procedures in accordance with the action plan as shown in **Table 11.13** should be followed.

Table 11.13: Event and Action Plan for Landscape and Visual Impact

Event/ Action	Action			
	ET	IEC	WKCDA	Contractor
Design Check	1. Design check to make sure the design complies with all the proposed mitigation measures in the EIA report; 2. Prepare and submit	1. Check report submitted by ET; 2. Recommend remedial design if necessary.	1. Undertake remedial design if necessary.	

Event/ Action	Action			
	ET	IEC	WKCDA	Contractor
	report.			
Non-conformity on one occasion	1. Identify source of non-conformity; 2. Report to IEC and WKCDA; 3. Discuss remedial actions with IEC, WKCDA and Contractor; 4. Monitor remedial actions until rectification has been completed.	1. Check and verify source of non-conformity; 2. Discuss remedial actions with ET and Contractor; 3. Advise WKCDA on effectiveness of proposed remedial actions; 4. Check implementation of remedial actions.	1. Notify Contractor; 2. Ensure remedial actions are properly implemented.	1. Amend working method as necessary; 2. Rectify damage and undertake necessary replacement and remedial actions.
Repeated non-conformity	1. Identify source of non-conformity; 2. Report to IEC and WKCDA; 3. Increase monitoring frequency; 4. Discuss remedial actions with IEC, WKCDA and Contractor; 5. Monitor remedial actions until rectification has been completed; 6. If non-conformity rectified, reduce monitoring frequency back to normal.	1. Check and verify source of non-conformity; 2. Check Contractor's working method; 3. Discuss remedial actions with ET and Contractor; 4. Advise WKCDA on effectiveness of proposed remedial actions; 5. Supervise implementation of remedial actions.	1. Notify Contractor; 2. Ensure remedial actions are properly implemented.	1. Amend working method as necessary; 2. Rectify damage and undertake necessary replacement and remedial actions.

12. Environmental Auditing

12.1 Site Inspections

Site inspections provide a direct means to trigger and enforce the specified environmental protection and pollution control measures. They should be undertaken routinely by the ET to inspect the construction activities in order to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. With well defined pollution control and mitigation specifications and a well established site inspection, deficiency and action reporting system, the site inspection is one of the most effective tools to enforce the environmental protection requirements on the construction site.

The ET Leader is responsible for formulating the environmental site inspection, the deficiency and action reporting system, and for carrying out the site inspection works. He should prepare a proposal for site inspection and deficiency and action reporting procedures to the IEC for agreement, and to the ER for approval. The Contractor's proposal for rectification would be made known to the ER and IEC.

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

- the EIA and EM&A recommendations on environmental protection and pollution control mitigation measures;
- the Environmental Permit conditions;
- ongoing results of the EM&A program;
- works progress and programme;
- individual works methodology proposals (which should include proposal on associated pollution control measures);
- contract specifications on environmental protection;
- relevant environmental protection and pollution control laws; and
- previous site inspection results undertaken by the ET and others.

The Contractor should keep the ET Leader updated with all relevant information on the construction contract necessary for him to carry out the site inspections. Inspection results and associated recommendations for improvements to the environmental protection and pollution control works should be submitted to the IEC and the Contractor within 24 hours for reference and for taking immediate action. The Contractor should follow the procedures and time-frame stipulated in the environmental site inspection, and the deficiency and action reporting system formulated by the ET Leader, to report on any remedial measures subsequent to the site inspections.

The ET should also carry out ad hoc site inspections if significant environmental problems are identified. Inspections may also be required subsequent to receipt of an environmental complaint, or as part of the investigation work.

12.2 Compliance with Legal and Contractual Requirements

There are contractual environmental protection and pollution control requirements as well as environmental protection and pollution control laws in Hong Kong with which construction activities must comply.

In order that the works are in compliance with the contractual requirements, relevant sections (e.g. sections related to environmental measures) of works method statements submitted by the Contractor to the ER for approval should be sent to the ET Leader for vetting to see whether sufficient environmental protection and pollution control measures have been included.

The ET Leader should also keep himself informed of the progress and programme of the works to check that relevant environmental laws have not been violated, and that any foreseeable potential for violation can be prevented.

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

After reviewing the documentation, the ET Leader should advise the Contractor of any noncompliance with contractual and legislative requirements on environmental protection and pollution control for them to take follow-up actions, including any potential violation of requirements.

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

12.3 Environmental Complaints

Complaints should be referred to the ET for action. The ET should undertake the following procedures upon receipt of any valid complaint:

- The Contractor to log complaint and date of receipt onto the complaint database and inform the ER, ET and IEC immediately;
- The Contractor to investigate 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, stations and parameters, if necessary;
- The Contractor to identify mitigation measures in consultation with the IEC, ET and ER if a complaint is valid and due to the construction works of the Project;
- The Contractor to implement the remedial measures as required by the ER and to agree with the ET and IEC any additional monitoring frequency, stations and parameters, where necessary, for checking the effectiveness of the mitigation measures;
- The ER, ET and IEC to review the effectiveness of the Contractor's remedial measures and the updated situation;
- 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;

- 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;
- 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.

Handling of environmental complaints should follow the environmental complaint flow diagram and reporting channel as presented in **Figure 12.1**.

During the complaint investigation work, the Contractor and ER should cooperate with the ET in providing all necessary information and assistance for completion of the investigation. If mitigation measures are identified in the investigation, the Contractor should promptly carry out the mitigation works. The ER should ensure that the measures have been carried out by the Contractor.

13. Reporting

13.1 Introduction

The reporting requirements of EM&A are based upon a paper-documented approach. However, the same information can be provided in an electronic medium upon agreeing the format with the IEC, the ER and EPD (for construction phase), and with the Environmental Consultant, WKCDA and EPD (for operation phase). This would enable a transition from a paper / historic and reactive approach to an electronic / real time proactive approach.

For construction phase of EM&A, types of reports that the ET Leader should prepare and submit include baseline monitoring report, monthly EM&A report, quarterly EM&A summary report and final EM&A review report. In accordance with Annex 21 of the EIAO-TM, a copy of the monthly, quarterly summary and final review EM&A reports should be submitted to the Director of Environmental Protection. The exact details of the frequency, distribution and time frame for submission should be agreed with the IEC, the ER and EPD prior to commencement of works

13.2 Baseline Monitoring Report

The ET Leader should prepare and submit a Baseline Environmental Monitoring Report within 10 working days of completion of the baseline monitoring. Copies of the Baseline Environmental Monitoring Report should be submitted to the Contractor, the IEC, the ER, WKCDA and EPD. The ET Leader should liaise with the relevant parties on the exact number of copies they require. The report format and baseline monitoring data format should be agreed with the IEC, the ER and EPD prior to submission.

The baseline monitoring report should 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) an updated construction programme with milestones of environmental protection / mitigation activities annotated

(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
- parameters monitored
- monitoring locations (and depth, where relevant)
- monitoring date, time, frequency and duration
- 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/monitoring
- weather conditions during the period/monitoring
- other factors which might affect results

(vi) determination of the Action and Limit Levels for each monitoring parameter and statistical analysis of the baseline data, the analysis should conclude if there is any significant difference between control and impact stations for the parameters monitored

(vii) revisions for inclusion in the EM&A Manual

(viii) comments and conclusions

13.3 Monthly EM&A Reports

The results and findings of all EM&A work carried out during the month should be recorded in the monthly EM&A reports prepared by the ET Leader. The EM&A report should be prepared and submitted within 10 working days after the end of each reporting month. Each monthly EM&A report should be submitted to the following parties: the Contractor, the IEC, the ER, WKCDA and the EPD. Before submission of the first EM&A report, the ET Leader should 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 leader should 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.

13.3.1 First Monthly EM&A Report

The first monthly EM&A report should include at least but not be limited to the following:

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

- breaches of Action and Limit levels
- complaint log
- notifications of any summons and status of prosecutions
- changes made that affect the EM&A
- future key issues

(ii) basic project information:

- project organisation including key personnel contact names and telephone numbers
- scope of works of the Project
- construction programme
- works undertaken during the month with illustrations (such as location of works etc)
- 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)

(iii) 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
- environmental requirements in contract documents

(iv) environmental status:

- advice on status of compliance with environmental permit including the status of submissions under the environmental permit

(v) implementation status:

- implementation status of environmental protection and pollution control / mitigation measures, as recommended in the EIA Report

(vi) monitoring results (in both hard and diskette copies) together with the following information:

- monitoring methodology
- name of laboratory and types of equipment used and calibration details
- parameters monitored
- monitoring locations
- monitoring date, time, frequency, and duration
- weather conditions during the period/monitoring
- graphical plots of the monitored parameters in the month annotated against
- the major activities being carried out on site during the period
- weather conditions that may affect the monitoring results
- any other factors which might affect the monitoring results
- QA/QC results and detection limits

(vii) analysis of monitoring results, non-compliance, complaints, and notifications of summons and status of prosecutions:

- analysis and interpretation of monitoring results in the month
- any non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels)
- changes made that affect the EM&A during the month
- 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

- notification of summons and status of 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
- reasons for and the implications of non-compliance, complaints, summons and prosecutions including review of pollution sources and working procedures
- actions taken in the event of non-compliance and deficiency, and follow-up actions related to earlier non-compliance

(viii) others

- an account of the future key issues as reviewed from the works programme and work method statements
- comment on the solid and liquid waste management status during the month including waste generation and disposal records
- outstanding issues and deficiencies
- comments on effectiveness of the environmental management systems, practices, procedures and mitigation measures), recommendations (for example, any improvement in the EM&A programme) and conclusions

(ix) appendix

- monitoring schedule for the present and next reporting period
- cumulative statistics on complaints, notifications of summons and successful prosecutions
- outstanding issues and deficiencies

13.3.2 Subsequent Monthly EM&A Reports

Subsequent monthly EM&A reports should include the following:

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

- breaches of Action and Limit levels
- complaint log
- notifications of any summons and status of prosecutions
- changes made that affect the EM&A
- future key issues

(ii) environmental status:

- advice on status of compliance with environmental permit including the status of submissions under the environmental permit

(iii) implementation status:

- implementation status of environmental protection and pollution control / mitigation measures, as recommended in the EIA Report

(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
- weather conditions during the period/monitoring
- graphical plots of the monitored parameters in the month annotated against:
  - the major activities being carried out on site during the period
  - weather conditions that may affect the monitoring results
  - any other factors which might affect the monitoring results
  - QA/QC results and detection limits

(v) analysis of monitoring results, non-compliance, complaints, and notifications of summons and status of prosecutions:

- analysis and interpretation of monitoring results in the month
- any non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels)
- changes made that affect the EM&A during the month
- 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
- notification of summons and status of 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
- reasons for and the implications of non-compliance, complaints, summons and prosecutions including review of pollution sources and working procedures
- actions taken in the event of non-compliance and deficiency, and follow-up actions related to earlier non-compliance

(vi) others

- an account of the future key issues as reviewed from the works programme and work method statements
- comment on the solid and liquid waste management status during the month including waste generation and disposal records
- outstanding issues and deficiencies

- comments on effectiveness of the environmental management systems, practices, procedures and mitigation measures), recommendations (for example, any improvement in the EM&A programme) and conclusions

(vii) appendix

- monitoring schedule for the present and next reporting period
- cumulative statistics on complaints, notifications of summons and successful prosecutions
- outstanding issues and deficiencies

Some information concerning the EM&A works, such as the EM&A requirements would remain unchanged throughout the EM&A programme. In the subsequent Monthly EM&A Reports, the First Monthly EM&A Report can be referred instead of repeating the description of the unchanged information.

13.4 Quarterly EM&A Reports

A quarterly EM&A report should be produced and should contain at least the following information. In addition, the first quarterly summary report should also confirm if the monitoring work is proving effective and that it is generating data with the necessary statistical power to categorically identify or confirm the absence of impact attributable to the works.

(i) up to half a page executive summary

(ii) basic project information including a synopsis of the project organisation and programme, and a synopsis of works undertaken during the quarter

(iii) a brief summary of EM&A requirements including:

- monitoring parameters
- environmental quality performance limits (Action and Limit levels)
- environmental mitigation measures, as recommended in the project EIA Final Report

(iv) drawings showing the project area, environmental sensitive receivers and the locations of the monitoring and control stations

(v) implementation status of environmental protection and pollution control / mitigation measures, as recommended in the EIA Report

(vi) graphical plots of the monitored parameters over the past four months (the last month of the previous quarter and the present quarter) for representative monitoring stations annotated against:

- the major activities being carried out on site during the period
- weather conditions during the period
- any other factors which might affect the monitoring results

(vii) advice on the solid and liquid waste management status during the quarter including waste generation and disposal records

(viii) a summary of non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels)

(ix) a brief review of the reasons for and the implications of any non-compliance, including a review of pollution sources and working procedures

(x) a summary description of actions taken in the event of non-compliance and any follow-up procedures related to any earlier non-compliance

(xi) a summary of all complaints received (written or verbal) for each media, liaison and consultation undertaken, actions and follow-up procedures taken

(xii) comments on the effectiveness and efficiency of the mitigation measures; recommendations on any improvement in the EM&A programme and conclusions for the quarter

(xiii) proponents' contacts and any hotline telephone number for the public to make enquiries.

13.5 Final EM&A Review Report

The EM&A program could be terminated upon completion of those construction activities that have the potential to cause significant environmental impacts, and / or the completion of operational traffic noise monitoring.

The proposed termination by the Contractor should only be implemented after the proposal has been endorsed by the IEC, the ER and WKCDA followed by final approval from the Director of Environmental Protection.

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

(i) an executive summary

(ii) basic project information including a synopsis of the project organisation and programme, contacts of key management, and a synopsis of work undertaken during the entire construction period

(iii) a brief summary of EM&A requirements including:

- monitoring parameters
- environmental quality performance limits (Action and Limit levels)
- environmental mitigation measures, as recommended in the project EIA study final report

(iv) drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations

(v) advice on the implementation status of environmental and pollution control / mitigation measures, as recommended in the project EIA study final report, summarised in the updated implementation status pro forma

(vi) graphical plots of the monitored parameters over the construction period for representative monitoring stations, including the post-project monitoring annotated against:

- the major activities being carried out on site during the period
- weather conditions during the period
- any other factors which might affect the monitoring results
- the baseline condition

(vii) compare the EM&A data with the EIA predictions

(viii) effectiveness of the solid and liquid waste management

(ix) a summary of non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels)

(x) a brief account of the reasons the non-compliance including a review of pollution sources and working procedures

(xi) a summary of the actions taken against the non-compliance

(xii) a summary of all complaints received (written or verbal) for each media, liaison and consultation undertaken, actions and follow-up procedures taken

(xiii) a review of the monitoring methodology adopted and with the benefit of hindsight, comment on its effectiveness (including cost effectiveness)

(xiv) a summary of notifications of summons and successful prosecutions for breaches of the current environmental protection/pollution control legislations, locations and nature of the breaches, investigation, follow-up actions taken and results

(xv) a review of the practicality and effectiveness of the EM&A programme (e.g. effectiveness and efficiency of the mitigation measures), and recommendation on any improvement in the EM&A programme

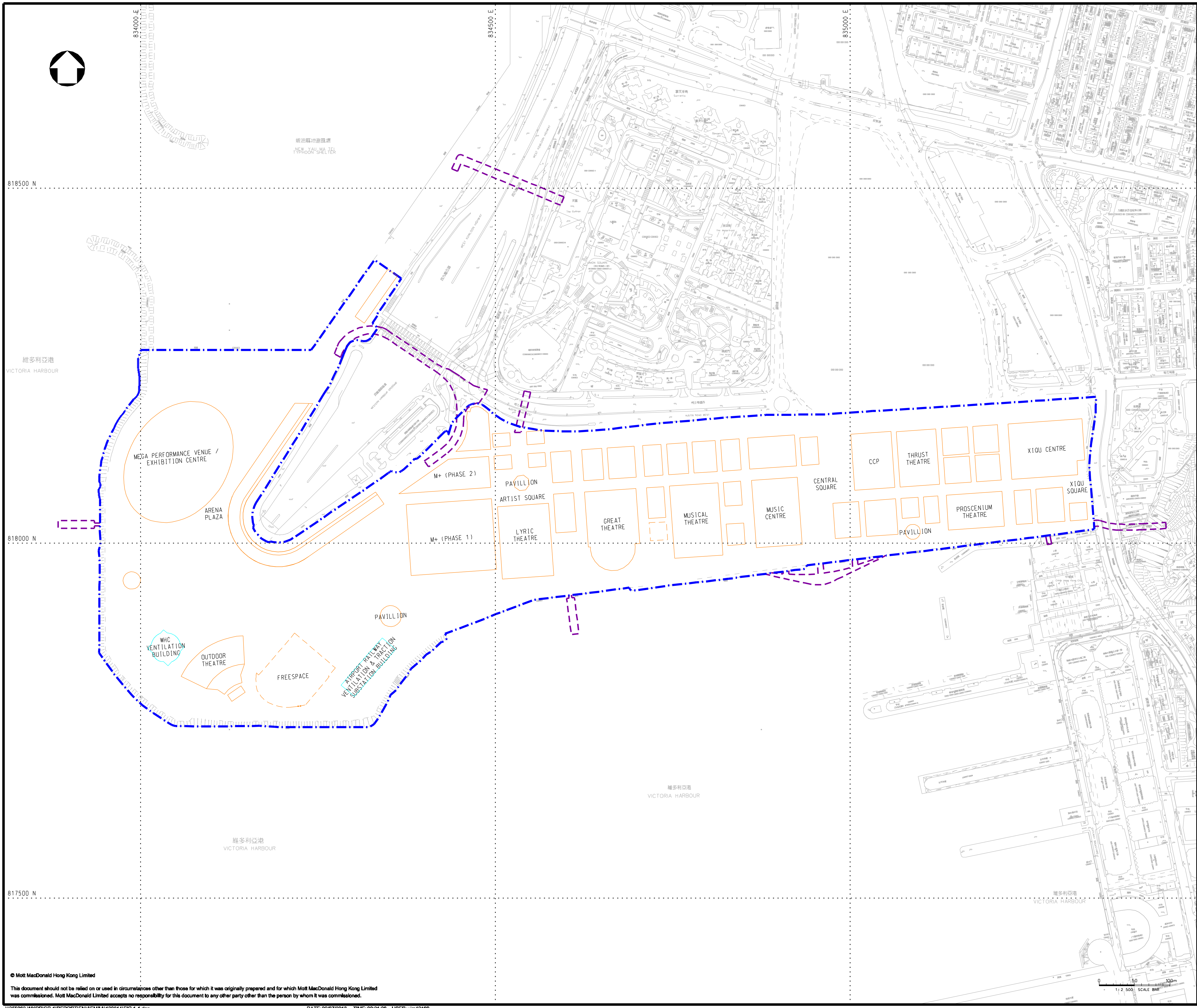
(xvi) a conclusion to state the return of ambient and / or the predicted scenario as per EIA findings

13.6 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 EM&A reporting documents. However, any such document should be retained by the ET Leader / Monitoring Team and be ready for inspection upon request. All relevant information should be clearly and systematically recorded in the document. Monitoring data should also be recorded in digital format, and the software copy must be available upon request. Data format should be agreed with the IEC, the ER, WKCDA and EPD. All documents and data should be kept for at least one year following completion of the construction contract and one year after the completion of operation phase monitoring for construction phase EM&A and operational phase EM&A respectively.

13.7 Interim Notifications of Environmental Quality Limit Exceedances

For construction phase EM&A, with reference to the Event and Action Plan, when the environmental quality performance limits are exceeded, the ET Leader should immediately notify the IEC, the ER, WKCDA and EPD, as appropriate and should keep them informed of the results of the investigation, proposed remedial measures, actions taken, updated situation on site, need for further follow-up proposals, etc. A sample template for the interim notifications is shown in **Appendix F**. The ET Leader may modify the interim notification form for this EM&A programme, the format of which should be approved by the ER and agreed by the IEC.



LEGEND:

- PROJECT BOUNDARY
- EXTERNAL CONNECTIONS (INDICATIVE SUBJECT TO FUTURE DESIGN & ARRANGEMENT)
- PROPOSED FOOTPRINT BOUNDARY
- EXISTING FACILITIES

Rev	Date	Drawn	Description	Ch'k'd	App'd
P3	JUN 13	MING	GENERAL REVISION	AM	AFK
P2	MAY 13	MING	GENERAL REVISION	EY	AFK
P1	APR 13	MING	FIRST ISSUE	DC	AFK

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Project

PROJECT CONSULTANCY STUDY FOR WEST KOWLOON CULTURAL DISTRICT DEVELOPMENT PLAN

Title

PROJECT LAYOUT

Designed	DC	Eng check	EC
Drawn	MING	Coordination	EC
Dwg check	DC	Approved	AFK

Scale at A1: 1:2500 | Status: PRE | Rev: P3

Drawing Number: FIGURE 1.1

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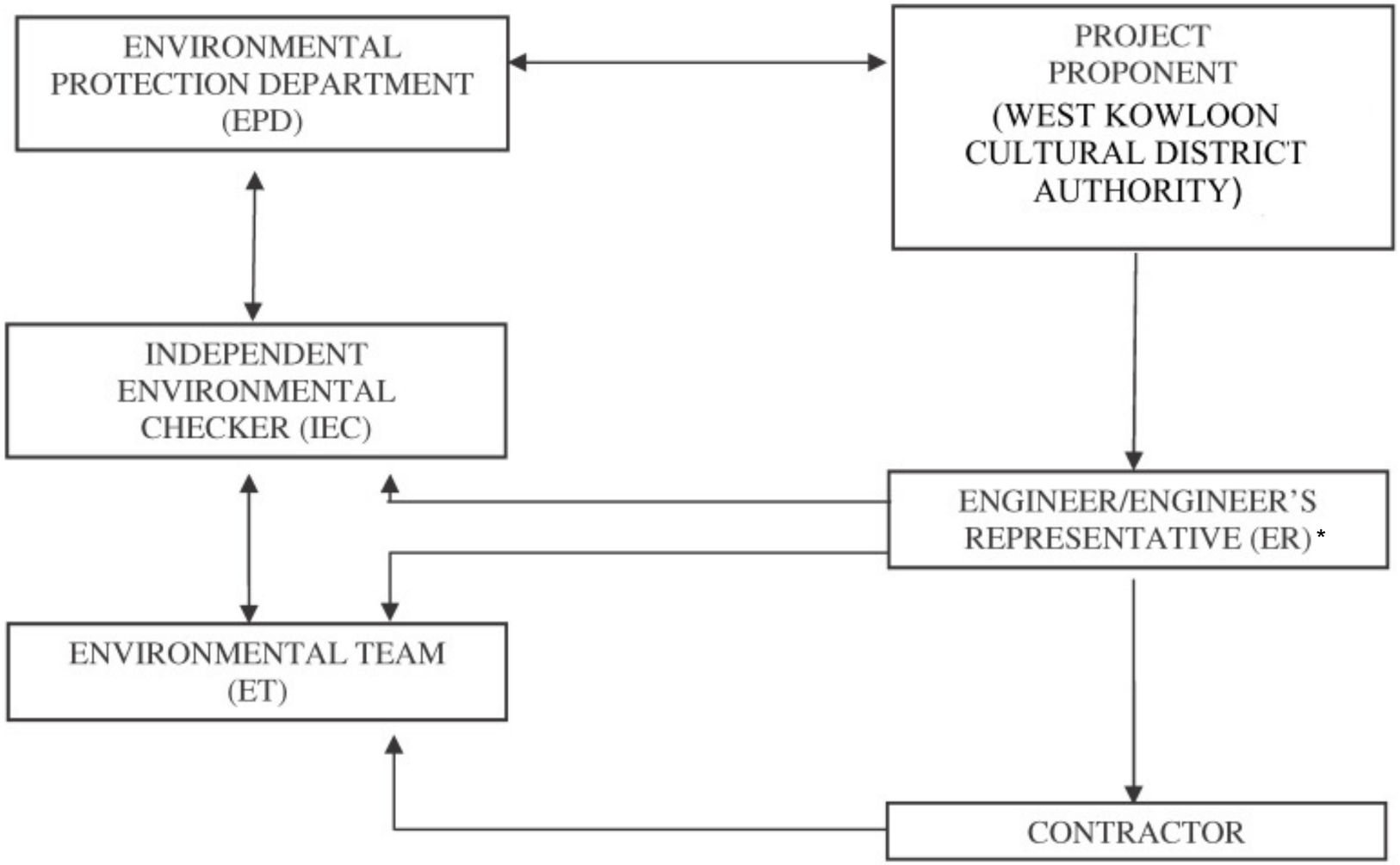

Remarks:
* WKCDA does not have an overall Engineer / Engineer's Representative for the whole project. Different construction projects within WKCD may have different arrangement such as appointment of a project management consultant.

Rev	Date	Drawn	Description	Chk'd	Appr'd
P1	AUG 12	ADA	FIRST ISSUE	AM	AFK

Client

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Project

PROJECT CONSULTANCY STUDY FOR WEST KOWLOON CULTURAL DISTRICT DEVELOPMENT PLAN

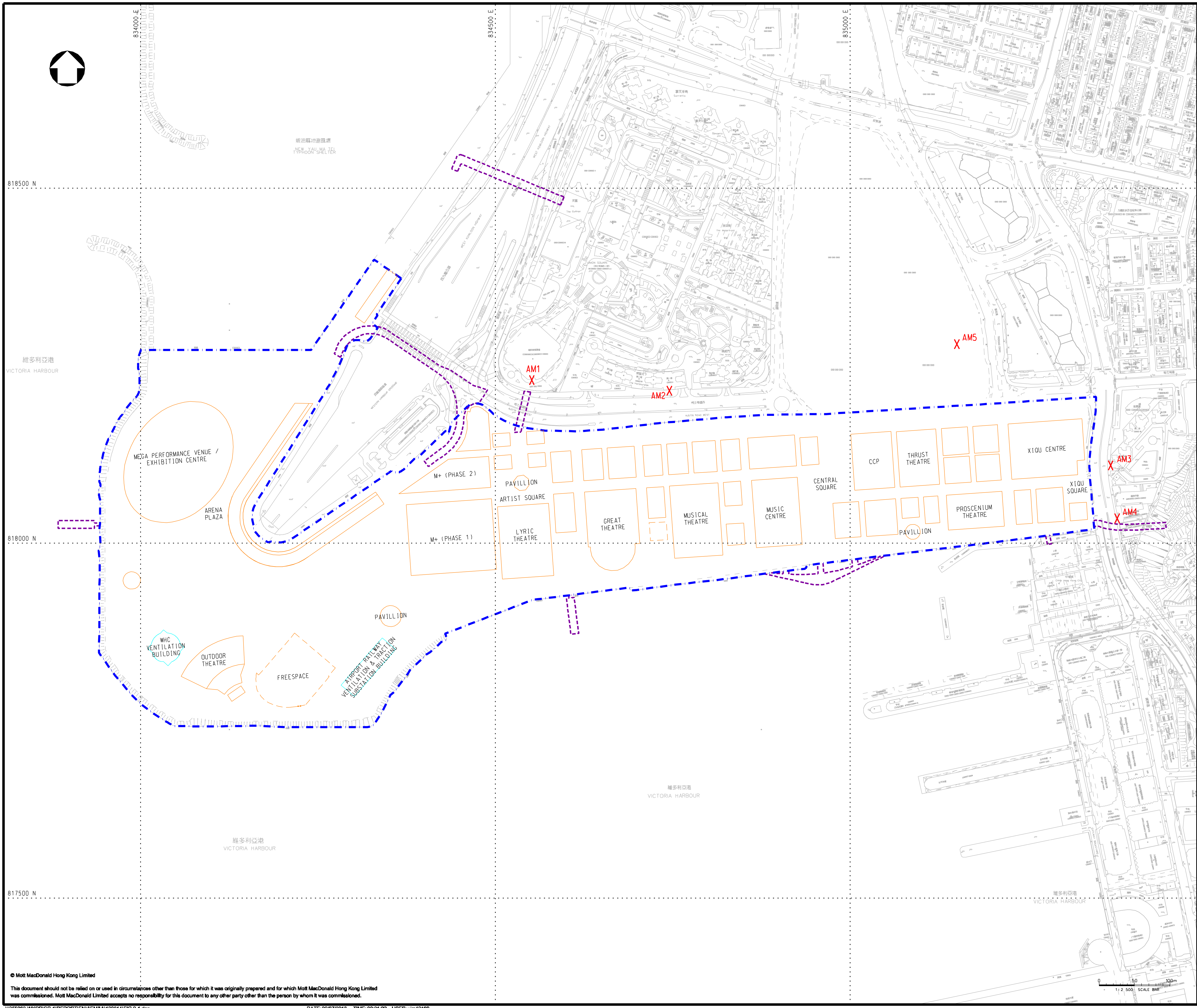
Title

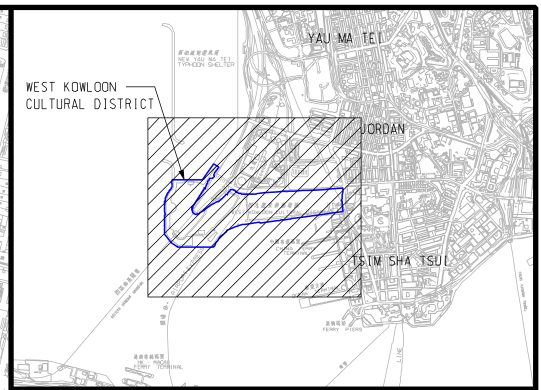
PROJECT ORGANISATION CHART

Designed	MMH		Eng check	EC	
Drawn	ADA		Coordination	EC	
Dwg check	AM		Approved	AFK	
Scale at A1	-	Status	PRE	Rev	P1

Drawing Number

FIGURE 1.2





KEY PLAN

LEGEND:

- PROJECT BOUNDARY
- EXTERNAL CONNECTIONS (INDICATIVE SUBJECT TO FUTURE DESIGN & ARRANGEMENT)
- PROPOSED FOOTPRINT BOUNDARY
- EXISTING FACILITIES
- X AM1 CONSTRUCTION AIR MONITORING STATIONS

Rev	Date	Drawn	Description	Ch'k'd	App'd
P4	JUN 13	MING	GENERAL REVISION	AM	AFK
P3	MAY 13	MING	GENERAL REVISION	EY	AFK
P2	MAR 13	MING	GENERAL REVISION	AM	AFK
P1	AUG 12	MING	FIRST ISSUE	AM	AFK

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Project

PROJECT CONSULTANCY STUDY FOR WEST KOWLOON CULTURAL DISTRICT DEVELOPMENT PLAN

Title

PROPOSED LOCATIONS OF CONSTRUCTION AIR MONITORING STATIONS

Designed	HC	Eng check	ST
Drawn	MING	Coordination	EC
Dwg check	HC	Approved	AFK
Scale at A1: 1:2500	Status: PRE	Rev: P4	

Drawing Number

FIGURE 2.1

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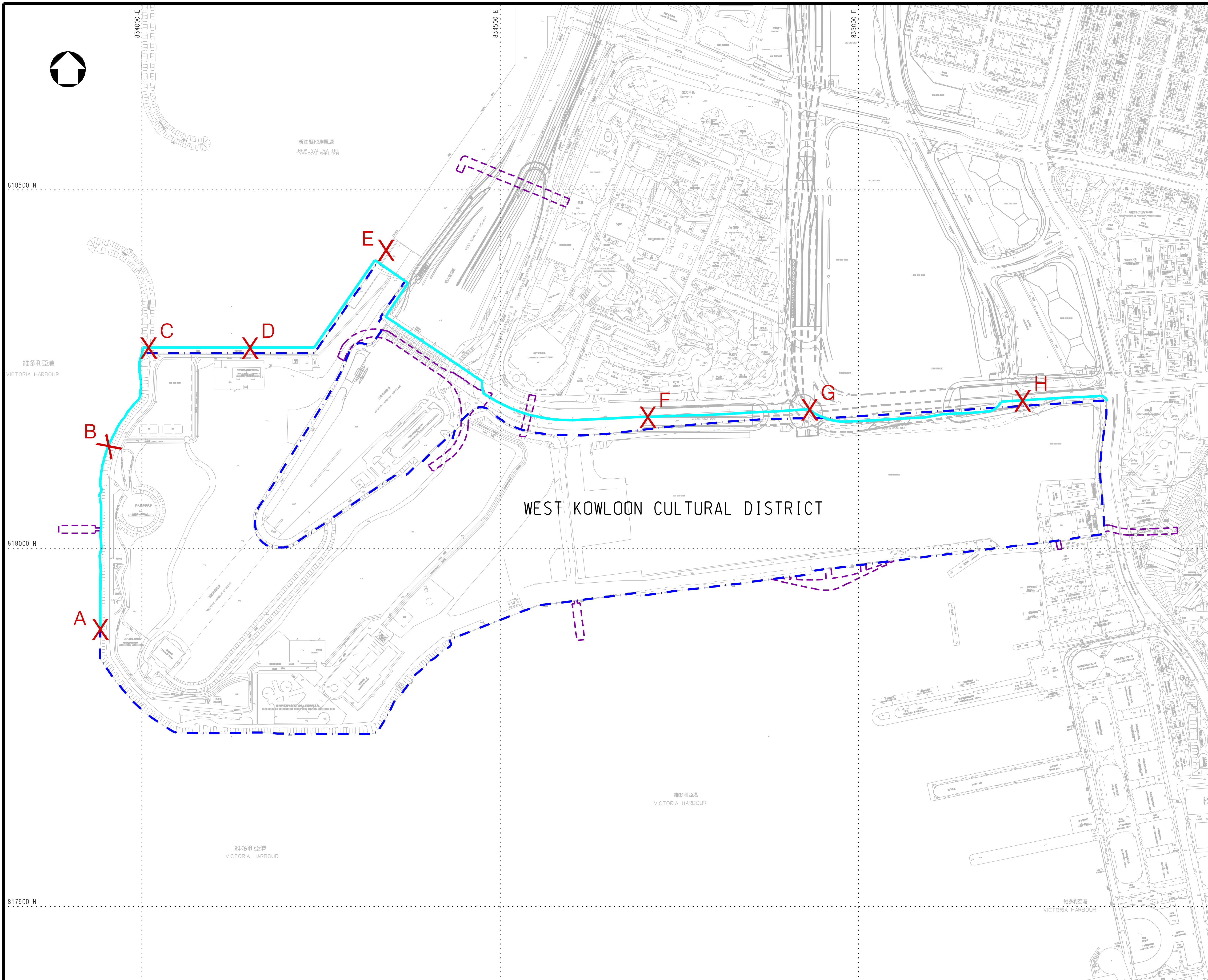

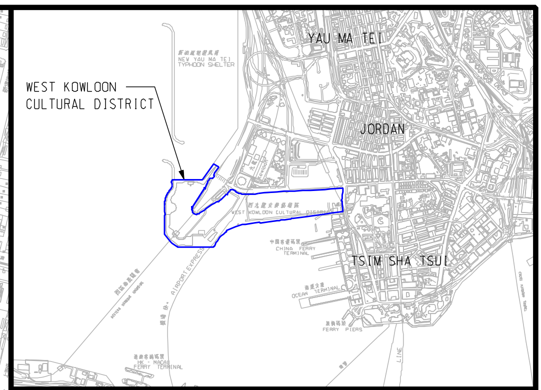

KEY PLAN

LEGEND:

- PROJECT BOUNDARY
- EXTERNAL CONNECTIONS (INDICATIVE SUBJECT TO FUTURE DESIGN & ARRANGEMENT)
- ODOUR PATROL ROUTE
- X ODOUR PATROL POINT

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	APR 13	MING	FIRST ISSUE	AM	AFK

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Project

PROJECT CONSULTANCY STUDY FOR WEST KOWLOON CULTURAL DISTRICT DEVELOPMENT PLAN

Title

PROPOSED LOCATIONS OF ODOUR PATROL ROUTE

Designed	AM	Eng check	EC
Drawn	MING	Coordination	EC
Dwg check	AM	Approved	AFK
Scale at A1: 1:2500	Status: PRE	Rev: P1	

Drawing Number

FIGURE 2.2

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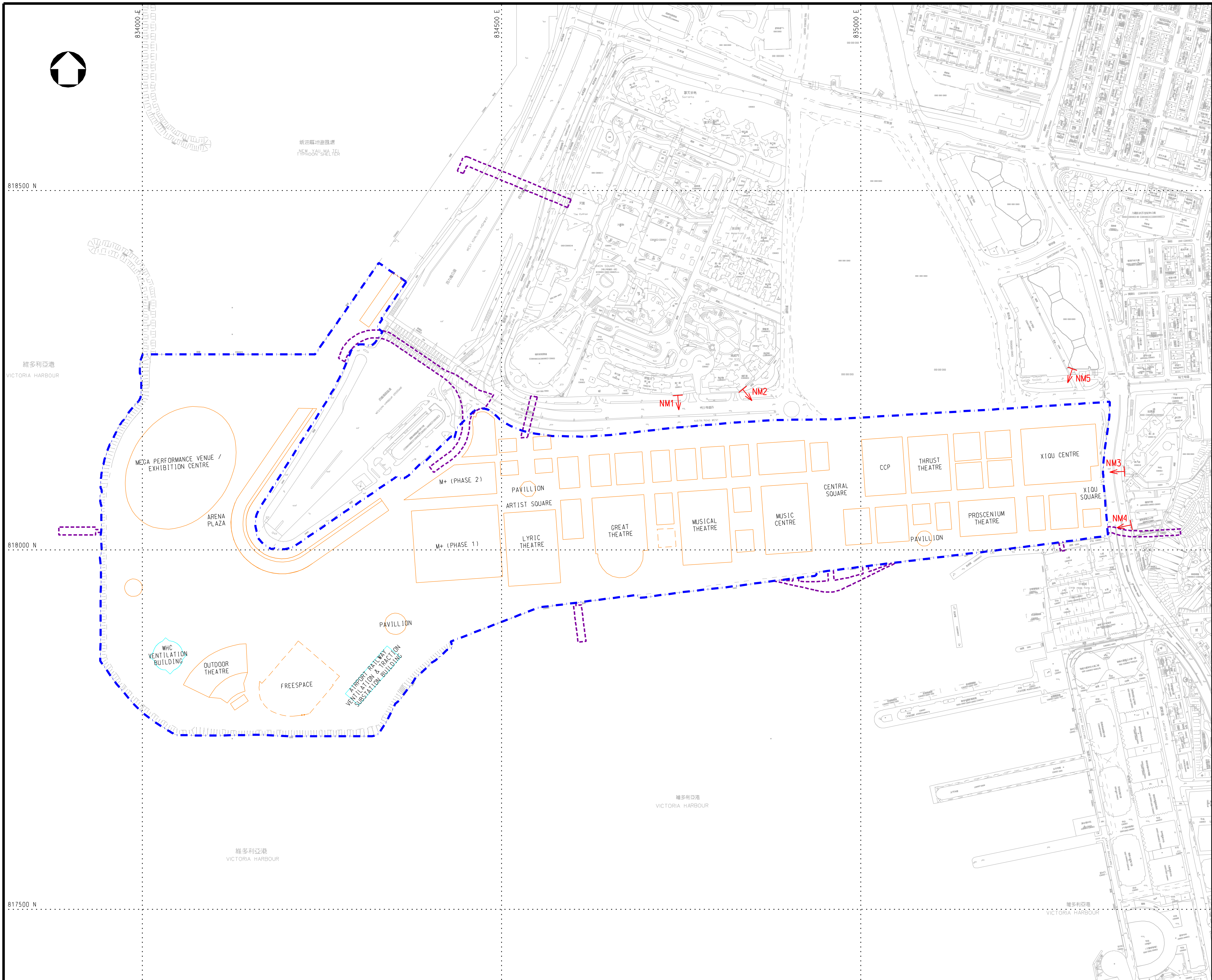

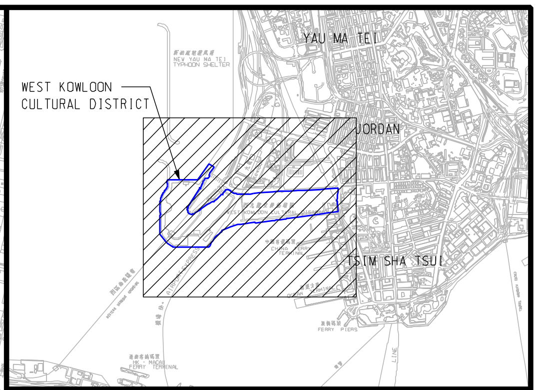

KEY PLAN

LEGEND:

- PROJECT BOUNDARY
- EXTERNAL CONNECTIONS (INDICATIVE SUBJECT TO FUTURE DESIGN & ARRANGEMENT)
- PROPOSED FOOTPRINT BOUNDARY
- EXISTING FACILITIES
- NM1 CONSTRUCTION NOISE MONITORING STATIONS

Rev	Date	Drawn	Description	Ch'k'd	App'd
P4	JUN 13	MING	GENERAL REVISION	AM	AFK
P3	MAY 13	MING	GENERAL REVISION	EY	AFK
P2	MAR 13	MING	GENERAL REVISION	AM	AFK
P1	AUG 12	MING	FIRST ISSUE	AM	AFK

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Project

PROJECT CONSULTANCY STUDY FOR WEST KOWLOON CULTURAL DISTRICT DEVELOPMENT PLAN

Title

PROPOSED LOCATIONS OF CONSTRUCTION NOISE MONITORING STATIONS

Designed	SC	Eng check	ST
Drawn	MING	Coordination	EC
Dwg check	SC	Approved	AFK
Scale at A1 1:2500	Status PRE	Rev P4	

Drawing Number

FIGURE 3.1

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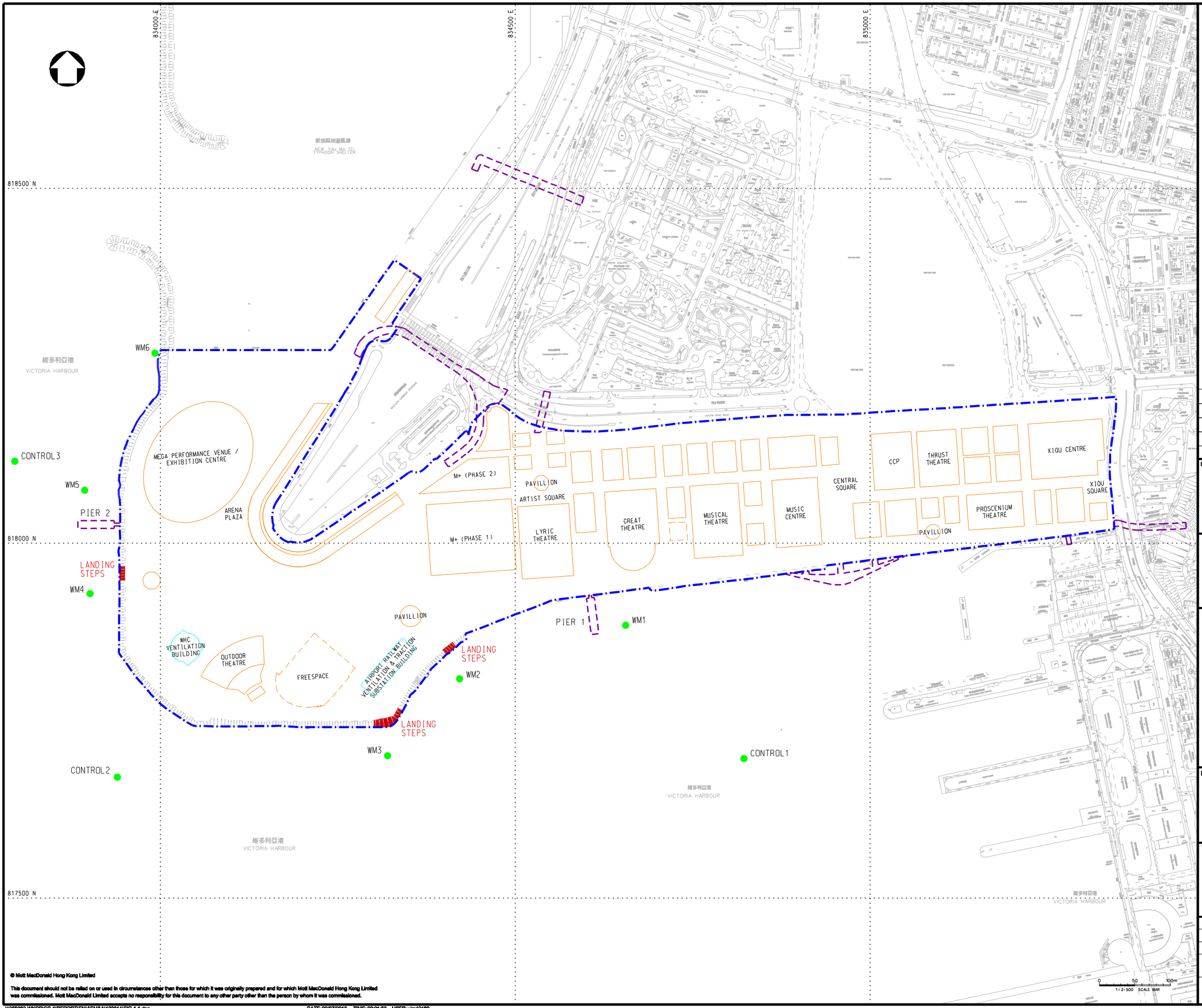

LEGEND:

- PROJECT BOUNDARY
- EXTERNAL CONNECTIONS (INDICATIVE SUBJECT TO FUTURE DESIGN & ARRANGEMENT)
- PROPOSED FOOTPRINT BOUNDARY
- EXISTING FACILITIES

COORDINATES:

	EASTING	NORTHING
WM1	834655.514	817884.206
WM2	834421.642	817808.805
WM3	834320.133	817700.358
WM4	833900.953	817928.753
WM5	833893.468	818074.444
WM6	833992.468	818267.662
CONTROL 1	834822.200	817696.342
CONTROL 2	833939.476	817670.234
CONTROL 3	833794.982	818115.304

Rev	Date	Drawn	Description	Ch'k'd	App'd
P4	JUN 13	MING	GENERAL REVISION	AM	AFK
P3	MAY 13	MING	GENERAL REVISION	EY	AFK
P2	MAR 13	MING	GENERAL REVISION	AM	AFK
P1	AUG 12	MING	FIRST ISSUE	IC	AFK

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Project

PROJECT CONSULTANCY STUDY FOR WEST KOWLOON CULTURAL DISTRICT DEVELOPMENT PLAN

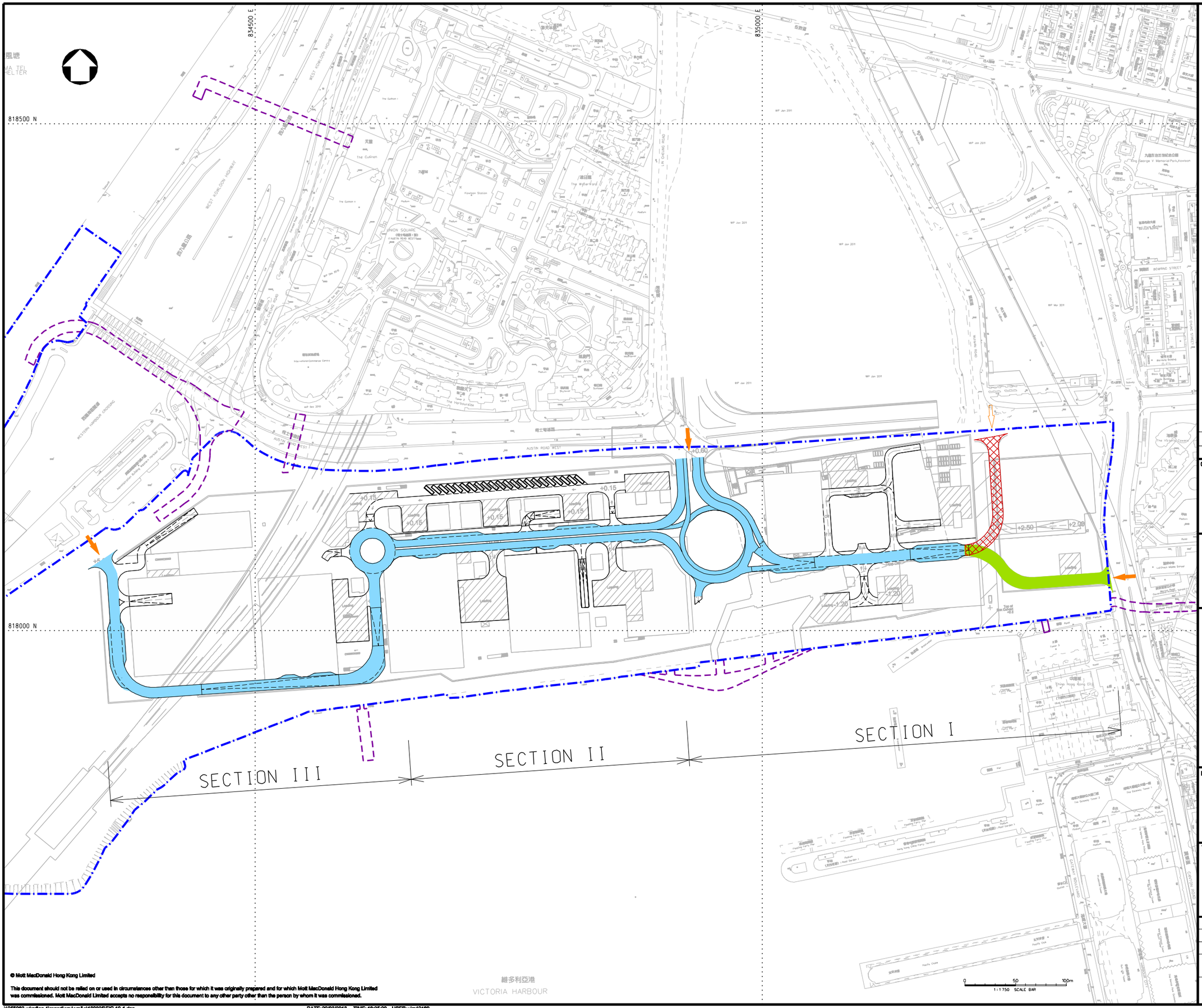
Title

PROPOSED LOCATIONS OF WATER QUALITY MONITORING STATIONS

Designed	AM		Eng check	EC	
Drawn	MING		Coordination	EC	
Dwg check	AM		Approved	AFK	
Scale at A1 1:2500		Status PRE		Rev P4	

Drawing Number

FIGURE 4.1



LEGEND:

- WKCD PROJECT BOUNDARY
- EXTERNAL CONNECTIONS (INDICATIVE SUBJECT TO FUTURE DESIGN & ARRANGEMENT)
- UNDERGROUND ROAD NETWORK
- UNDERGROUND ROAD ALIGNMENT (TENTATIVELY YEAR 2030 AND AFTER)*
- UNDERGROUND ROAD ALIGNMENT (TENTATIVELY BEFORE YEAR 2030)*
- ACCESS POINT
- INTERIM ACCESS POINT

* ASSUMING THE TSIM SHA TSUI FIRE STATION WILL BE RELOCATED FROM THE CURRENT SITE BEFORE 2025

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	MAR 13	MING	FIRST ISSUE	AM	AFK

Client

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Project

PROJECT CONSULTANCY STUDY FOR WEST KOWLOON CULTURAL DISTRICT DEVELOPMENT PLAN

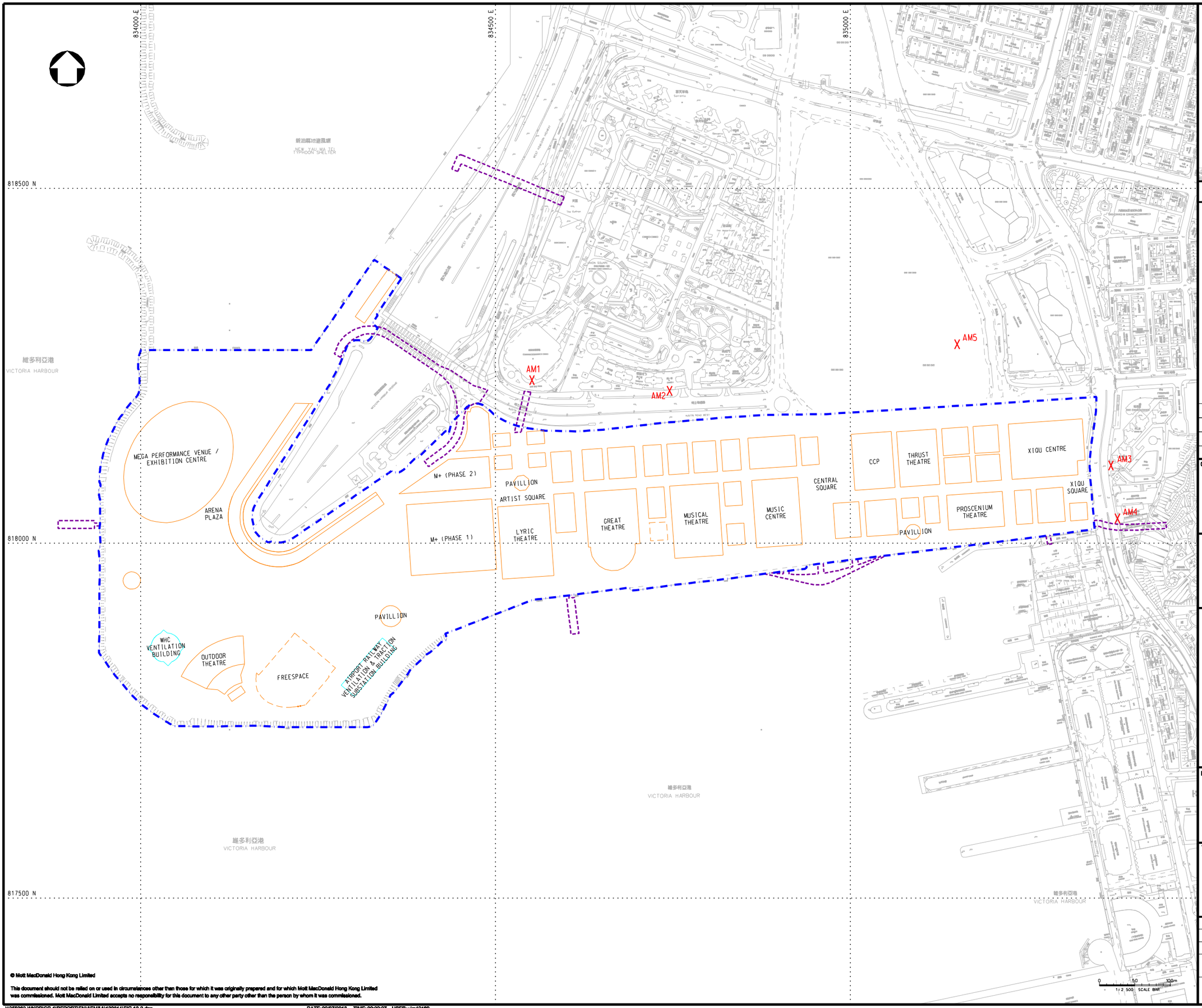
Title

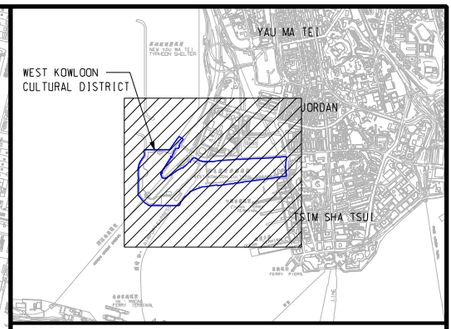
PROJECT LAYOUT FOR UNDERPASS ROADS

Designed	DC		Eng check	EC	
Drawn	MING		Coordination	EC	
Dwg check	DC		Approved	AFK	
Scale at A1 1:1750		Status PRE		Rev P1	

Drawing Number

FIGURE 10.1





KEY PLAN

LEGEND:

- PROJECT BOUNDARY
- EXTERNAL CONNECTIONS (INDICATIVE SUBJECT TO FUTURE DESIGN & ARRANGEMENT)
- PROPOSED FOOTPRINT BOUNDARY
- EXISTING FACILITIES
- AM1 CONSTRUCTION AIR MONITORING STATIONS

Rev	Date	Drawn	Description	Ch'k'd	App'd
P3	JUN 13	MING	GENERAL REVISION	AM	AFK
P2	MAY 13	MING	GENERAL REVISION	EY	AFK
P1	MAR 13	MING	FIRST ISSUE	AM	AFK

Client

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Project

PROJECT CONSULTANCY STUDY FOR WEST KOWLOON CULTURAL DISTRICT DEVELOPMENT PLAN

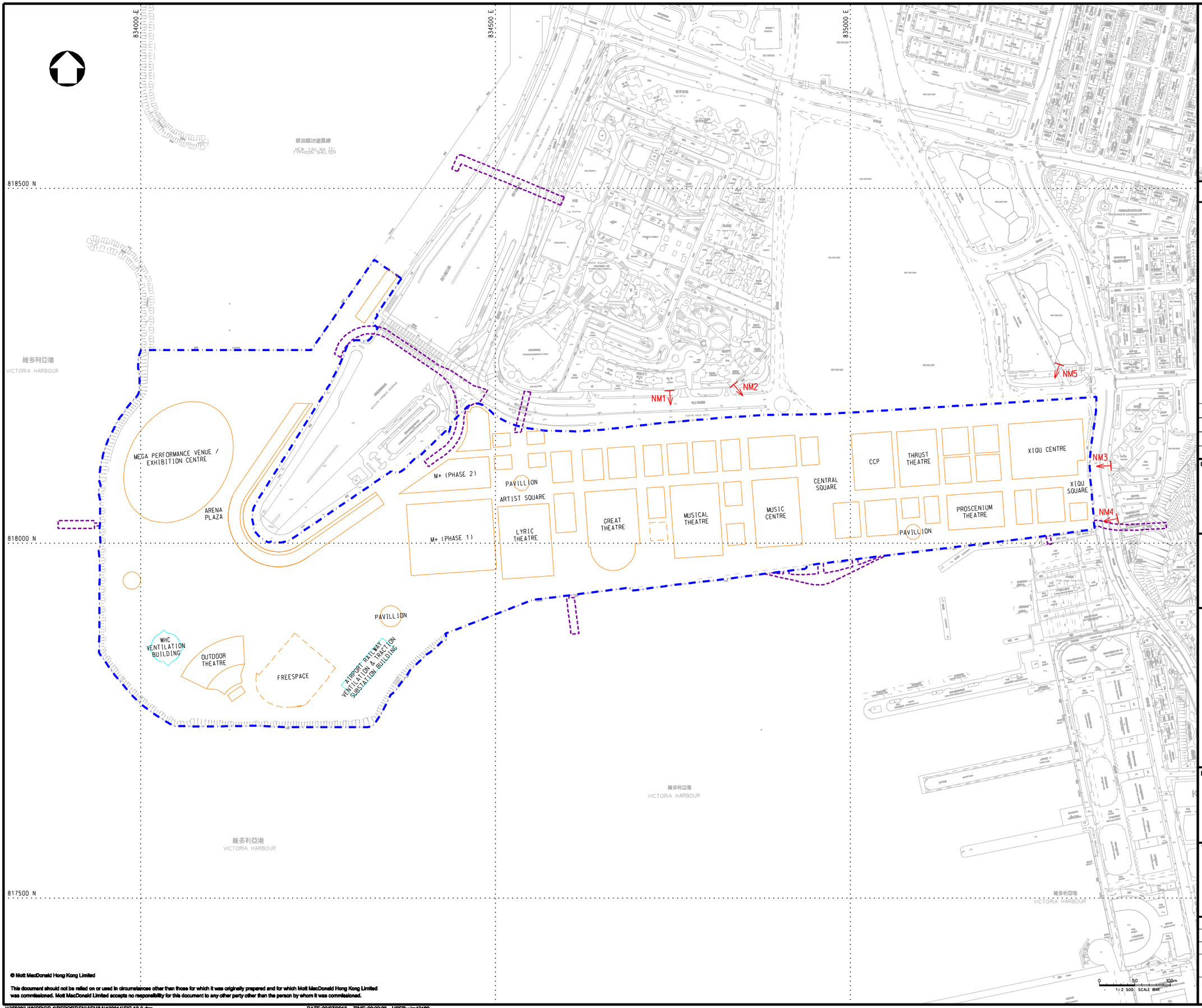
Title

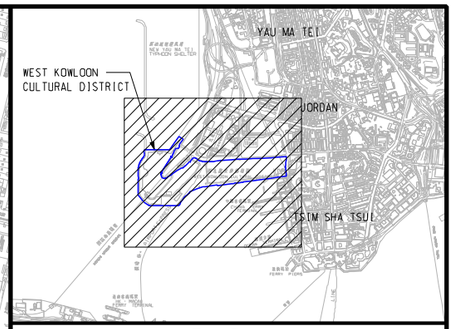
PROPOSED LOCATIONS OF CONSTRUCTION AIR MONITORING STATIONS FOR UNDERPASS

Designed	HC		Eng check	ST	
Drawn	MING		Coordination	EC	
Dwg check	HC		Approved	AFK	
Scale at A1 1:2500		Status PRE		Rev P3	

Drawing Number

FIGURE 10.2





KEY PLAN

LEGEND:

- PROJECT BOUNDARY
- EXTERNAL CONNECTIONS (INDICATIVE SUBJECT TO FUTURE DESIGN & ARRANGEMENT)
- PROPOSED FOOTPRINT BOUNDARY
- EXISTING FACILITIES
- NM1 CONSTRUCTION NOISE MONITORING STATIONS

Rev	Date	Drawn	Description	Ch'k'd	App'd
P3	JUN 13	MING	GENERAL REVISION	AM	AFK
P2	MAY 13	MING	GENERAL REVISION	EY	AFK
P1	MAR 13	MING	FIRST ISSUE	AM	AFK

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Project

PROJECT CONSULTANCY STUDY FOR WEST KOWLOON CULTURAL DISTRICT DEVELOPMENT PLAN

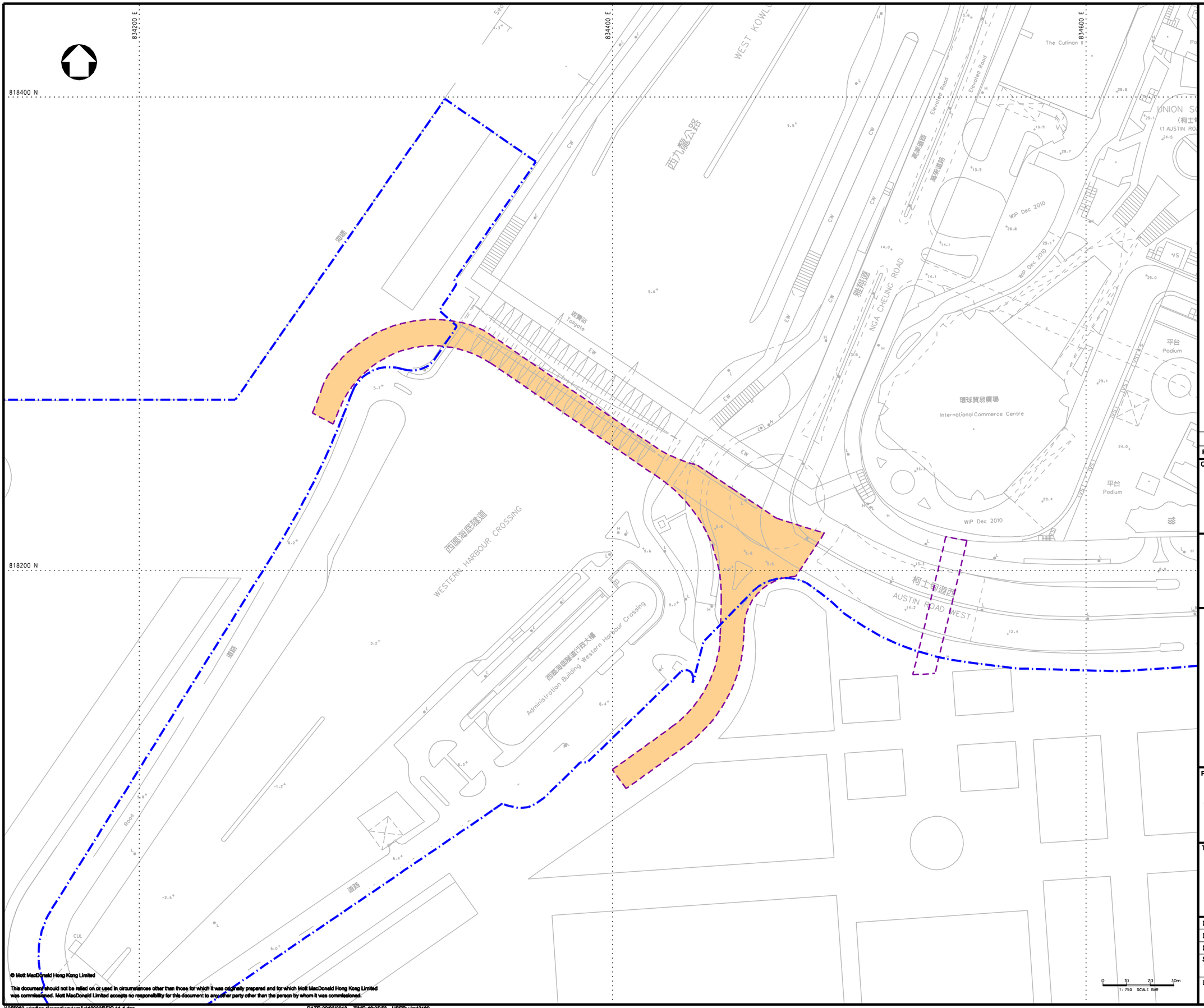
Title

PROPOSED LOCATIONS OF CONSTRUCTION NOISE MONITORING STATIONS FOR UNDERPASS

Designed	SC		Eng check	ST	
Drawn	MING		Coordination	EC	
Dwg check	SC		Approved	AFK	
Scale at A1	1:2500	Status	PRE	Rev	P3

Drawing Number

FIGURE 10.3



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j:\255962-wkcd\cp-1\report\env\em&a\130325\FIG 11-1.dgn DATE: 22/03/2013 TIME: 18:25:53 USER: yim42169

LEGEND:

- WKCD PROJECT BOUNDARY
- EXTERNAL CONNECTIONS (INDICATIVE SUBJECT TO FUTURE DESIGN & ARRANGEMENT)
- FLYOVER

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	MAR 13	MING	FIRST ISSUE	AM	AFK

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PROJECT CONSULTANCY STUDY FOR WEST KOWLOON CULTURAL DISTRICT DEVELOPMENT PLAN

Title

PROJECT LAYOUT FOR FLYOVER

Designed	DC		Eng check	EC
Drawn	MING		Coordination	EC
Dwg check	DC		Approved	AFK

Scale at A1 1:750

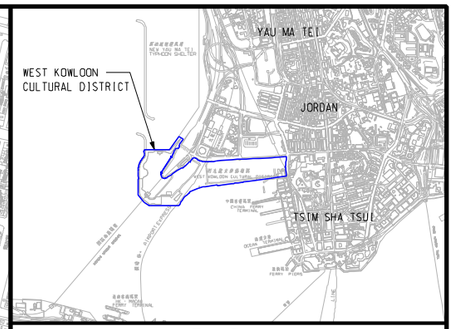
Status PRE

Rev P1

Drawing Number

FIGURE 11.1

834000 E
834500 E
835000 E
818500 N
818000 N
新油麻地避風塘
NEW YAU MA TEI TYPHOON SHELTER
維多利亞港
VICTORIA HARBOUR
P44
AM1
AM2
ARENA
PLAZA
P47
P46
Mega Performance Venue/ Exhibition Centre
P43
P42
P37
P36
P39
M+ (Phase 2)
P38
P34
P31
P41
ARTIST SQUARE
P29
P28
P27
P24
P22
P19
P17
P16
CENTRAL SQUARE
P14
CCP
P12
Thrust Theatre
P09
P05
P01
Xiqu
P06
P07
XIQU SQUARE
P02
P03
P04
P40
M+ (Phase 1)
P35
Lyric Theatre
P32
P30
Great Theatre
P28
P25
P23
Musical Theatre
P20
P21
P18
Music Centre
P15
P13
P11
P10
P8
Proscenium Theatre
P52
P53
P48
Western Harbour Crossing Ventilation Building
P50
Outdoor Theatre
P51
Freespace
P49
Airport Railway Ventilation and Traction Substation Building
0 50 100m
1 : 2 500 SCALE BAR



KEY PLAN

LEGEND:

- PROJECT BOUNDARY
- FLYOVER
- AM1 CONSTRUCTION AIR MONITORING STATION

Rev	Date	Drawn	Description	Ch'k'd	App'd
P3	JUN 13	MING	GENERAL REVISION	AM	AFK
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P1	MAR 13	MING	FIRST ISSUE	AM	AFK

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Project

PROJECT CONSULTANCY STUDY FOR WEST KOWLOON CULTURAL DISTRICT DEVELOPMENT PLAN

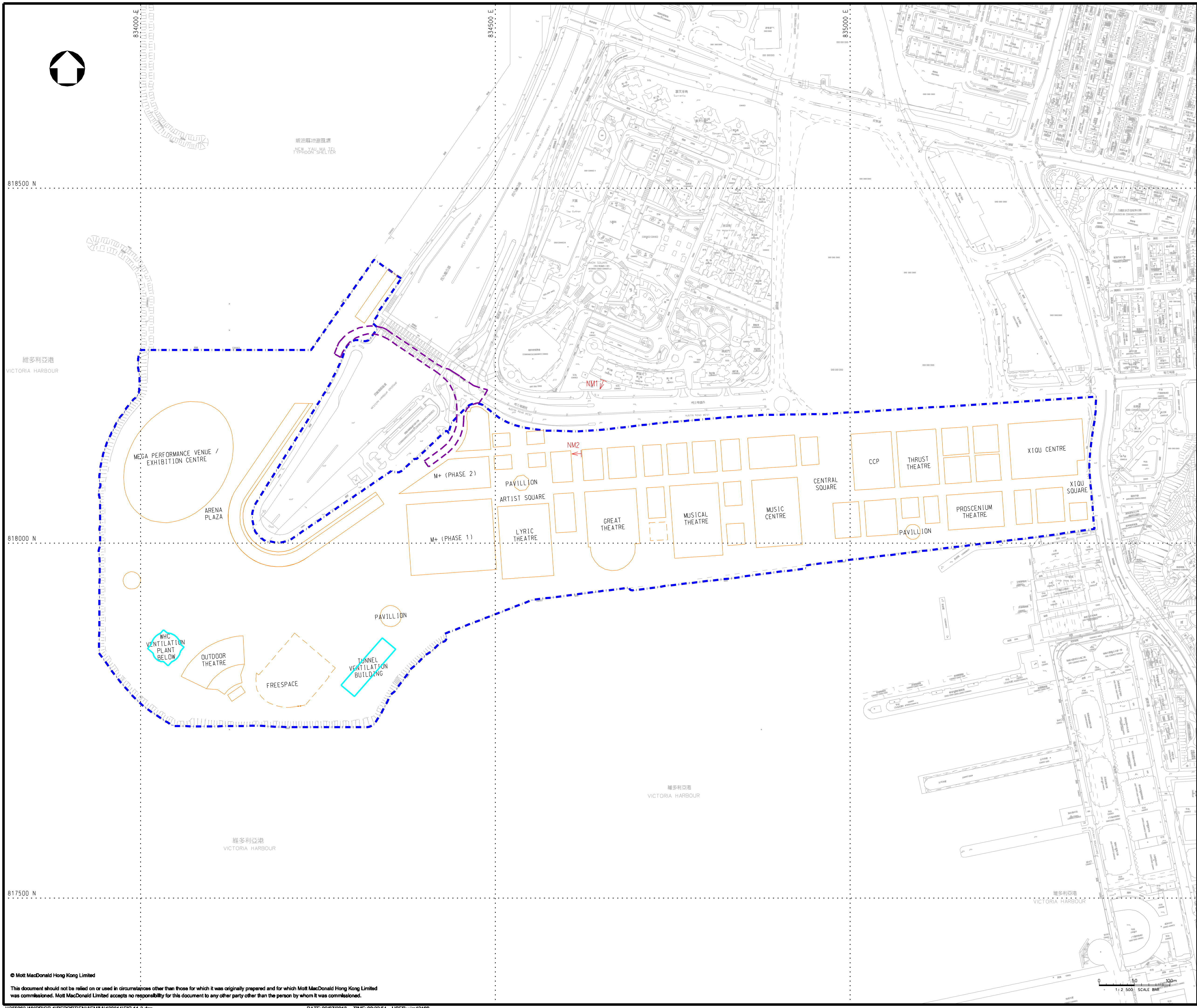
Title

PROPOSED LOCATIONS OF CONSTRUCTION AIR MONITORING STATIONS FOR FLYOVER

Designed	AM		Eng check	EC	
Drawn	MING		Coordination	EC	
Dwg check	AM		Approved	AFK	
Scale at A1 1:2500		Status PRE		Rev P3	

Drawing Number

FIGURE 11.2



LEGEND:

- PROJECT BOUNDARY
- FLYOVER
- PROPOSED FOOTPRINT BOUNDARY
- EXISTING FACILITIES
- NM1 CONSTRUCTION NOISE MONITORING STATION

Rev	Date	Drawn	Description	Ch'k'd	App'd
P3	JUN 13	MING	GENERAL REVISION	AM	AFK
P2	MAY 13	MING	GENERAL REVISION	EY	AFK
P1	MAR 13	MING	FIRST ISSUE	AM	AFK

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PROJECT CONSULTANCY STUDY FOR WEST KOWLOON CULTURAL DISTRICT DEVELOPMENT PLAN

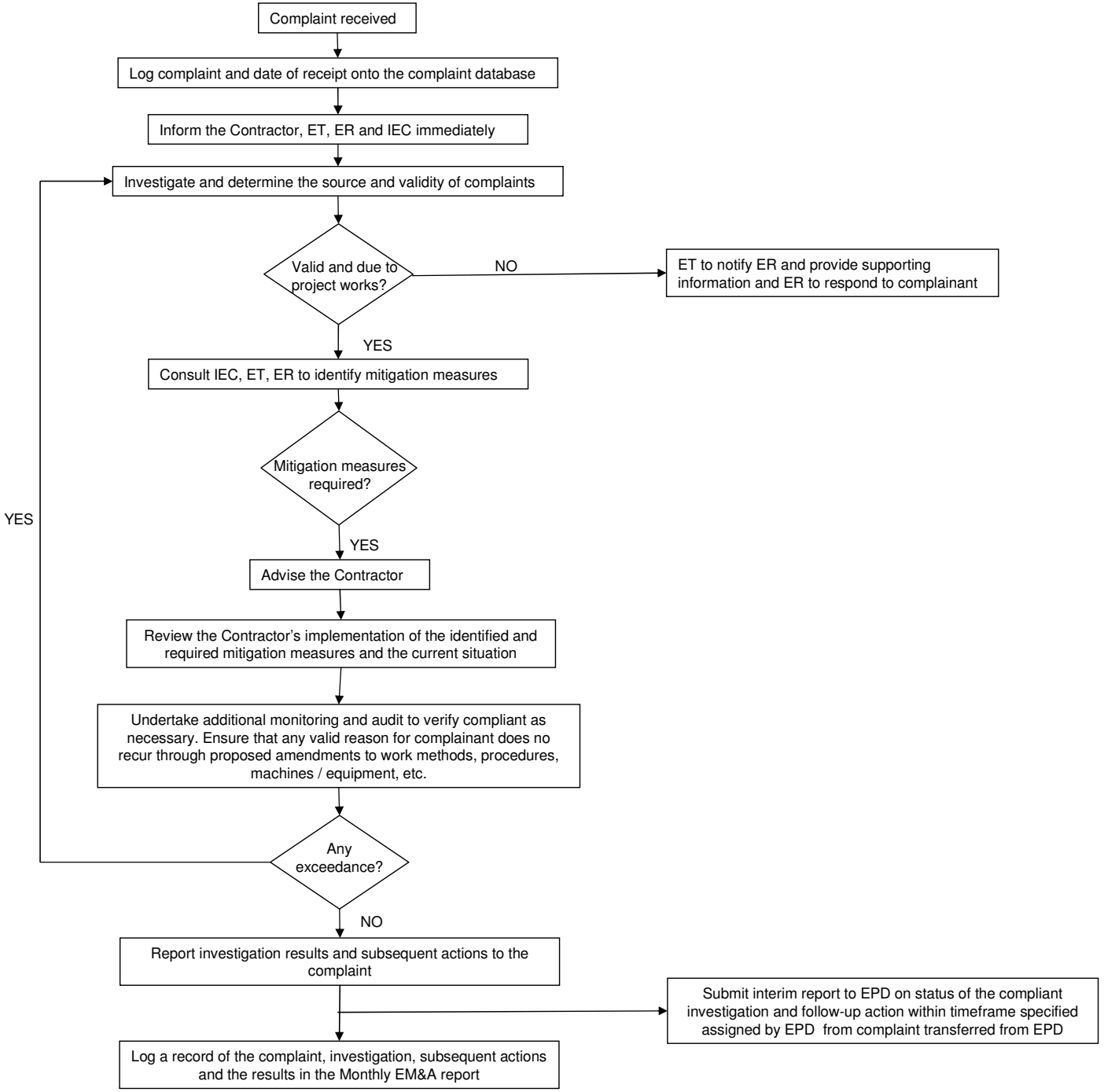
Title

PROPOSED LOCATIONS OF CONSTRUCTION NOISE MONITORING STATIONS

Designed	AM	Eng check	EC
Drawn	MING	Coordination	EC
Dwg check	AM	Approved	AFK
Scale at A1: 1:2500	Status: PRE	Rev: P3	

Drawing Number

FIGURE 11.3



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PROJECT CONSULTANCY STUDY FOR WEST KOWLOON CULTURAL DISTRICT DEVELOPMENT PLAN

Title

FLOW CHART OF COMPLAINT INVESTIGATION PROCEDURES

Designed	AM		Eng check	EC	
Drawn	MING		Coordination	EC	
Dwg check	AM		Approved	AFK	

Scale at A1	Status	Rev
1:2500	PRE	P1

Drawing Number

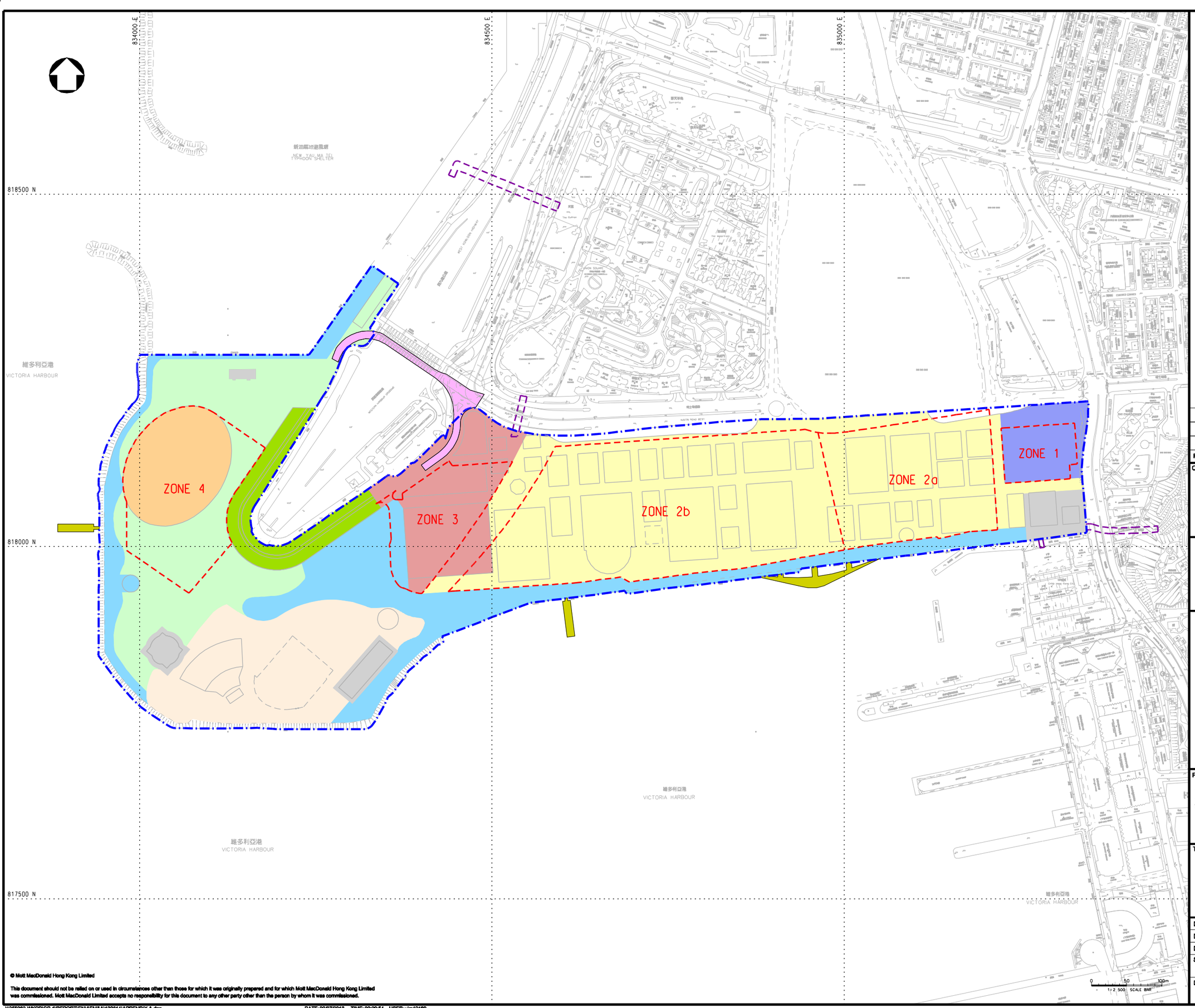
FIGURE 12.1

Appendix 2.4 - Tentative Construction Programme

Zone	Activity	Duration (m)
1		
	Construction of Diaphragm Wall	4
	Bored Piling	3
	Excavation	4
	Basement (Note 1)	5
	Superstructure (Note 2)	18
	Total	31 mth
2		
	Construction of Diaphragm Wall	8
	Bored Piling	9
	Excavation	20
	Basement (Note 1)	33
	Superstructure (Note 2)	62
	Total	84 mth
3		
	Construction of Diaphragm Wall	7
	Bored Piling	8
	Excavation	6
	Basement (Note 1)	11
	Superstructure (Note 2)	24
	Total	48 mth
4		
	Construction of Diaphragm Wall	10
	Bored Piling	10
	Excavation	13
	Basement	11
	Superstructure (Note 2)	35
	Total	53 mth
5 (Hotel)	Site Formation	7
	Foundation Works	7
	Superstructure (Note 2)	22
	Total	36 mth
Great Park		
Zone A	Park Construction	19
Zone B	Park Construction	29
Zone C	Park Construction	24
	Total	72
	Flyover	
	ICC Footbridge	15
	Barging Point	39
	East Concrete Batching Plant (Operation) (Note 3)	36
	East Concrete Batching Plant (Demolition)	6
	West Concrete Batching Plant (Construction)	6
	West Concrete Batching Plant (Operation) (Note 4)	45
	Modification of seawalls / construction of seawater intake & outfalls	12

Note:
1. Basement construction includes underpass roads.
2. Superstructure construction includes concrete works, building service & architectural builders works.
3. Phase 1 Concrete Batching Plant in Environmental Review for Proposed West Kowloon Terminus Concrete Batching Facility will be handed over to WKCDA starting from the year of 2014.
4. Demolition of the West Concrete Batching Plant will within Year 2021 with a duration of 6 monthes.
5. The construction of Anchorage Footbridge will begin after Year 2020.
6. The construction of the possible piers and viewing platform is subject to the requirements of the Protection of the Harbour Ordinacne (PHO) (Cap. 531) and therefore a programme is currently unavailable. Relevant assessments have included the construction of these two components in every year of the construction period until 2021 for worst case scenario.
7. The relocation of TST fire station is assumed before 2025 and have a demolition period of half year. The construction of permanent underpass and relative superstructure development will be after the demolition period and with a duration around 3 years. Kowloon Park Footbridge will be started after all other WKCD construction works complete at 2030 with a duration around 2 years.

Assumption for Excavation:
1. Assume 4 barging points with capacity of 1000m^3/barge/day. (Barge size 50 to 60m in length)
2. Assume normal dump truck capacity 5m^3/run
3. Assume big dump truck capacity 10m^3/run (for internal use only).



LEGEND:

- PROJECT BOUNDARY
- FOOTBRIDGE *
- BASEMENT LEVEL ZONE
- FLYOVER *
- POSSIBLE PIER / VIEWING PLATFORM *

GROUND LEVEL ZONE:-

- ZONE 1
- ZONE 2
- ZONE 3
- ZONE 4
- ZONE 5 (HOTEL)
- ZONE A (THE PARK)
- ZONE B (THE PARK)
- ZONE C (THE PARK)
- EXCLUDED AREAS

REMARK:

* INDICATIVE SUBJECT TO FUTURE DESIGN & ARRANGEMENT

Rev	Date	Drawn	Description	Ch'k'd	App'd
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PROJECT CONSULTANCY STUDY FOR WEST KOWLOON CULTURAL DISTRICT DEVELOPMENT PLAN

Title

CONSTRUCTION ZONES

Designed	DC		Eng check	EC	
Drawn	MING		Coordination	EC	
Dwg check	DC		Approved	AFK	
Scale at A1	1:2500	Status	PRE	Rev	P3

Drawing Number

APPENDIX A

Appendix B. Sample Environmental Monitoring Data Recording Sheets

Data Sheet for 24-hr TSP Monitoring

Monitoring Location		
Details of Location		
Sampler Identification		
Date & Time of Sampling		
Elapsed-time Meter Reading	Start (hour)	
	Stop (hour)	
Total Sampling Time (min.)		
Weather Conditions		Fine / Sunny / Cloudy / Rainy
Site Conditions		
Initial Flow Rate, Qsi	Pi (hpa)	
	Ti (^{o}C)	
	Hi (cfm)	
	Qsi (Std. m^3)	
Final Flow Rate, Qsf	Pf (hpa)	
	Tf (^{o}C)	
	Hf (cfm)	
	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)		
Observations / Remarks		

	Name & Designation	Signature	Date
Field Operator:	_____	_____	_____
Checked by:	_____	_____	_____

Data Sheet for 1-hr TSP Monitoring

Monitoring Location				
Details of Location				
Sampler Identification				
Date of Sampling				
Time of Sampling		1	2	3
Elapsed-time	Start Time			
Meter Reading	End Time			
Total Sampling Time (min.)				
Measured TSP Level (□g/m^3)				
Weather Conditions		Fine / Sunny / Cloudy / Rainy		
Site Conditions				
Observations / Remarks				

	Name & Designation	Signature	Date
Record by:	_____	_____	_____
Checked by:	_____	_____	_____

Odour Patrol Record Sheet

General Information	
Monitoring Station	
Date	
Weather	
Temperature	
Hunmidity	

ID	Location	Time	Odour Intensity		Odour Characteristics	Wind Direction	Wind Speed	Remarks
			OI-1	**OI-2**				

Note:

1. Odour intensity is to be divided into 5 levels which are ranked in the descending order as follows:
   - 0 - Not detected. No odour perceived or an odour so weak that it cannot be easily characterised or described;
   - 1 - Slight Identifiable odour, and slight chance to have odour nuisance;
   - 2 - Moderate Identifiable odour, and moderate chance to have odour nuisance;
   - 3 - Strong Identifiable, likely to have odour nuisance;
   - 4 - Extreme Severe odour, and unacceptable odour level.

2. OI-1 & OI-2: Odour intensity detected by panel member 1 & 2

	Name & Designation	Signature	Date
Record by:	_____	_____	_____
Checked by:	_____	_____	_____

Noise Monitoring Field Record Sheet

Monitoring Location							
Details of Location							
Date of Monitoring							
Measurement Start Time (hh:mm)							
Measurement Time Length (min.)							
Weather Conditions	Fine / Sunny / Cloudy / Rainy						
Wind Speed (m/s)							
Noise Meter Model/Identification							
Calibrator Model/Identification							
Calibration Before Measurement (dB(A))							
Calibration After Measurement (dB(A))							
Measurement Result	5min	5min	5min	5min	5min	5min	30min
L_{90} (dB(A))							
L_{10} (dB(A))							
L_{eq} (dB(A))							
Major Construction Noise Source(s) During Monitoring							
Other Noise Source(s) During Monitoring							
Remarks							

	Name & Designation	Signature	Date
Record by:	_____	_____	_____
Checked by:	_____	_____	_____

Water Quality Monitoring Data Record Sheet

Location			
Date			
Start Time (hh:mm)			
Weather			
Sea Conditions			
Tidal Mode			
Water Depth (m)			
Monitoring Results		1st reading	2nd reading or Duplicate
Salinity			
Temperature	°C		
DO Saturation	(%)		
DO	(mg/l)		
Turbidity			
SS Sample ID			
SS	(mg/l)		
Observed construction activities	<100m from location		
	>100m from location		
Other Observations			

	Name & Designation	Signature	Date
Recorded by :			
Checked by:			

Note: The SS results are to be filled up once they are available from the laboratory.

Appendix C. Implementation Schedule for Environmental Mitigation Measures for WKCD Schedule 3 EIA

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
Air Quality Impact (Construction)									
3.5.1.3	2.1	**General Dust Control Measures** Frequent water spraying for active construction areas (12 times a day or once every one hour), including Heavy construction activities such as construction of buildings or roads, drilling, ground excavation, cut and fill operations (i.e., earth moving)	Within WKCD site / Duration of the construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIA Recommendation and Air Pollution Control (Construction Dust) Regulation
3.7.1.2	2.1	**Best Practice For Dust Control** The relevant best practices for dust control as stipulated in the Air Pollution Control (construction Dust) Regulation should be adopted to further reduce the construction dust impacts from the Project. These best practices include: *Good Site Management* ▪ Good site management is important to help reducing potential air quality impact down to an acceptable level. As a general guide, the Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimise the release of visible dust emission. Any piles of materials accumulated on or around the work areas should be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimising generation of fugitive dust emissions. The material should be handled properly to prevent fugitive dust emission before cleaning. *Disturbed Parts of the Roads* ▪ Each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates	Within WKCD site / Duration of the construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIA Recommendation and Air Pollution Control (Construction Dust) Regulation

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		and kept clear of dusty materials; or ■ Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet. *Exposed Earth* ■ Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies. *Loading, Unloading or Transfer of Dusty Materials* ■ All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet. *Debris Handling* ■ Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides. ■ Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped. *Transport of Dusty Materials* ■ Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards. *Wheel washing* ■ Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. *Use of vehicles* ■ The speed of the trucks within the site should be controlled								

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		to about 10km/hour in order to reduce adverse dust impacts and secure the safe movement around the site. ▪ Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. ▪ Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle. *Site hoarding* ▪ Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit.						
3.7.1.3	2.1	**Best Practicable Means for Cement Works (Concrete Batching Plant)** The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93) should be followed and implemented to further reduce the construction dust impacts of the Project. These best practices include: Exhaust from Dust Arrestment Plant ▪ Wherever possible the final discharge point from particulate matter arrestment plant, where is not necessary to achieve dispersion from residual pollutants, should be at low level to minimise the effect on the local community in the case of abnormal emissions and to facilitate maintenance and inspection	Within WKCD site / Duration of the construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIA recommendation; Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
		Emission Limits ▪ All emissions to air, other than steam or water vapour, shall be colourless and free from persistent mist or smoke Engineering Design/Technical Requirements ▪ As a general guidance, the loading, unloading, handling and storage of fuel, raw materials, products, wastes or by-products should be carried out in a manner so as to prevent the release of visible dust and/or other noxious or offensive emissions							
Air Quality Impact (Operation)									
3.7.2	2.2	**Vehicular and Marine Emissions** No mitigation measure is required.							
3.7.3.1	2.2	**Improvement works for New Yau Ma Tei Typhoon Shelter (NYMTTS) for Odour Mitigation**							
		▪ Implementation of the DSD's project to install new Dry Weather Flow Interceptor (DWFI) for Cherry Street Box Culvert as a high priority.	New Yau Ma Tei Typhoon Shelter / Early 2014 to 2nd half of 2018 (subject to successful bid for funding)	DSD			✓		EIA recommendation
		▪ Improvement of three existing DWFIs upstream of Cherry Street Box Culvert and/or two existing DWFIs upstream of Jordan Road Box Culvert as part of the project titled "Upgrading of West Kowloon and Tsuen Wan Sewerage" as a high priority.	New Yau Ma Tei Typhoon Shelter / 2016 to end 2023 (subject to successful bid for funding)	DSD			✓		EIA recommendation
3.7.3.2	2.2	**Optional Waste facilities** This facility will be located at basement levels. In addition, the odour containment and control measures to be implemented	Within WKCD site / Duration and timing to be determined	WKCDA			✓		EIA recommendation

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		include: ▪ The waste facilities will be totally enclosed. Negative pressure ventilation will be provided within the enclosures to avoid any fugitive odorous emission from the facilities. In addition, any waste storage tanks will be connected to deodorisation facilities directly to eliminate the odour problem. ▪ Air inside the enclosures will be collected by air handling equipment for containing and directing odorous gases to deodorisation facilities. ▪ Deodorisation facilities by chemical, biological or physical methods (e.g. adsorption by activated carbon) with a minimum odour removal efficiency of 95% will be provided to treat potential odorous emissions from the facilities so as to minimise any potential odour impact to the nearby ASRs.							
Noise Impact (Construction)									
4.7.1	3.1	**Good Site Practice** Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during each phase of construction: ▪ only well-maintained plant to be operated on-site and plant should be serviced regularly during the construction works; ▪ machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum; ▪ plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs; ▪ mobile plant should be sited as far away from NSRs as possible; and	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIAO and Noise Control Ordinance

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		▪ material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site construction activities.							
4.7.1	3.1	**Adoption of Quieter PME** The recommended quieter PME adopted in the assessment were taken from the EPD's QPME Inventory and "*Sound Power Levels of Other Commonly Used PME*" are presented in **Table 4.26** in the EIA report. It should be noted that the silenced PME selected for assessment can be found in Hong Kong.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIAO and Noise Control Ordinance
4.7.1	3.1	**Use of Movable Noise Barriers** Movable noise barriers can be very effective in screening noise from particular items of plant when constructing the Project. Noise barriers located along the active works area close to the noise generating component of a PME could produce at least 10 dB(A) screening for stationary plant and 5 dB(A) for mobile plant provided the direct line of sight between the PME and the NSRs is blocked.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIAO and Noise Control Ordinance
4.7.1	3.1	**Use of Noise Enclosure/ Acoustic Shed** The use of noise enclosure or acoustic shed is to cover stationary PME such as air compressor and concrete pump. With the adoption of the noise enclosure, the PME could be completely screened, and noise reduction of 15 dB(A) can be achieved according to the EIAO Guidance Note No.9/2010.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIAO and Noise Control Ordinance
4.7.1	3.1	**Use of Noise Insulating Fabric** Noise insulating fabric can also be adopted for certain PME (e.g. drill rig, pilling machine etc). The fabric should be lapped such that there are no openings or gaps on the joints. According to the approved Tsim Sha Tsui Station Northern Subway EIA report (AEIAR-127/2008), a noise reduction of 10 dB(A) can be achieved for the PME lapped with the noise insulating fabric.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIAO and Noise Control Ordinance
4.7.1	3.1	**Scheduling of Construction Works outside School Examination Periods** During construction phase, the contractor should liaise with the	Within WKCD site / During construction phase / Prior to	Contractor appointed by		✓			EIAO and Noise Control Ordinance

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		educational institutions (including NSRs LCS and CRGPS) to obtain the examination schedule and avoid the noisy construction activities during school examination periods.	commencement of operation	WKCDA					
Noise Impact (Operation)									
4.7.2	3.2	**Road Traffic Noise** At-receiver mitigation measures should be considered in terms of self-protecting building design such as shielding by balcony. The balcony shall be designed with depth more than 1m with solid parapet of about 1.5m high and ceiling lined with absorptive material to face the noise source at Parcels 3, 5, 9, 24, 27, 28 & 29.	Along parts of Austin Road West and Canton Road / During operation phase / Throughout operation phase	Design Architect / Contractor appointed by WKCDA	✓		✓		EIAO
4.7.2	3.2	**Road Traffic Noise** Sound-absorbing materials should be installed on inner walls and ceilings of the underpass at the portals at the junction of Lin Cheung Road and Austin Road West, interim access of Austin Road West and permanent access at Canton Road. The sound-absorbing materials would be extended at least 30m into the underpass at the portals.	Portal at the junction of Lin Cheung Road and Austin Road West, Interim Access at Austin Road West and Permanent access at Canton Road / Before commencement of operation of road project	Contractor appointed by WKCDA / Highways Department	✓	✓	✓		EIAO
4.7.3	3.2	**Fixed Plant Noise** Specification of the maximum allowable sound power levels of the proposed fixed plants during daytime and night-time should be followed. The following noise reduction measures should be considered as far as practicable during operation: ▪ Choose quieter plant such as those which have been effectively silenced; ▪ Include noise levels specification when ordering new plant (including chillier and E/M equipment);	Within WKCD site / During operation phase / Throughout operation phase	Design Architect / Contractor appointed by WKCDA	✓		✓		EIAO and Noise Control Ordinance

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
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		▪ Locate fixed plant/louvre away from any NSRs as far as practicable; ▪ Locate fixed plant in walled plant rooms or in specially designed enclosures; ▪ Locate noisy machines in a basement or a completely separate building; ▪ Install direct noise mitigation measures including silencers, acoustic louvres and acoustic enclosure where necessary; and ▪ Develop and implement a regularly scheduled plant maintenance programme so that equipment is properly operated and serviced in order to maintain a controlled level of noise.							
4.7.5	3.2	**Ground-borne Noise** Given stringent acoustic performance requirement for the world-class venues, at-receiver end noise and vibration control measures such as building isolation and or box-in-box installation would be required by the acoustic and theatre designers of the venues including CCP, Xiqu Centre, Museum M+ (Phases 1 & 2) and Lyric Centre. The exact measures to be adopted are subject to the later detailed structural and foundation designs of the art performance venues.	Within WKCD site / During operation phase / Prior to commencement of operation	Design Architect / Contractor appointed by WKCDA	✓		✓		EIAO
4.7.7	3.2	**Marine Traffic Noise** At-receiver mitigation measures by designing the buildings so as to avoid any sensitive façades with openable window facing the noise source at Parcels 2, 3, 10, 11, 13, 21, 26 and 32 are proposed.	Within WKCD site / During operation phase / Throughout operation phase	Design Architect / Contractor appointed by WKCDA	✓		✓		EIAO

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
Water Quality Impact (Construction)									
5.7.1.1	4.1	**Construction site runoff and drainage** The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended to protect water quality and sensitive uses of the coastal area, and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impacts: ▪ 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, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities. The design of the temporary on-site drainage system should be undertaken by the WKCDA's Contractor prior to the commencement of construction; ▪ Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the WKCDA's Contractor prior to the commencement of construction. ▪ 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 during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each	Within WKCD site / Duration of the construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			ProPECC Note PN 1/94

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		rainstorm to ensure that these facilities are functioning properly at all times. ▪ Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities. ▪ 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 facility should be provided at construction site exit where practicable. Wash-water should have sand and silt settled out and removed regularly 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. ▪ Open stockpiles of construction materials or construction wastes on-site 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 be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and stormwater runoff being directed into foul sewers. ▪ Precautions should be taken at any time of the year when rainstorms are likely. Actions should be taken when a rainstorm is imminent or forecasted and actions to be taken							

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
		during or after rainstorms are summarized in Appendix A2 of ProPECC Note 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. ▪ Bentonite slurries used in piling or slurry walling should be reconditioned and reused wherever practicable. Temporary enclosed storage locations 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 Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.							
5.7.1.2	4.1	**Construction of cooling water discharge/outfalls, landing steps and optional piers/floating "art" pontoon** To minimise any adverse water quality impact during modification of seawalls for construction of cooling water discharges/outfalls and landing steps and installation of marine piles for construction of the optional piers, silt curtains should be deployed to completely enclose the modification of seawalls and marine pile installation works. The Contractor should be responsible for the design, installation and maintenance of the silt curtains to minimize the impacts on water quality. The design and specification of the silt curtains should be submitted by the Contractor to the Engineer for approval.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			WPCO
5.7.1.3	4.1	**Barging facilities and activities** Recommendations for good site practices during operation of the proposed barging point include: ▪ All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; ▪ Loading of barges and hoppers should be controlled to	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			WPCO

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		prevent splashing of material into the surrounding water. Barges or hoppers should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation; ▪ All hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; and ▪ Construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site.							
5.7.1.4	4.1	**Sewage effluent from construction workforce** Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			ProPECC Note PN 1/94
5.7.1.5	4.1	**General construction activities** Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby storm water drain. Stockpiles of cement and other construction materials should be kept covered when not being used. Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby storm water drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			ProPECC Note PN 1/94
Water Quality Impact (Operation)									
5.7.2.1	4.2	**Road and surface runoff**	Within WKCD site / During operation phase /	HyD (for exclusive			✓		ProPECC Note

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
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		For operation of the proposed WKCD development and associated local road network, a surface water drainage system would be provided to collect road and surface runoff. It is recommended that the road drainage should be provided with adequately designed silt trap and oil interceptors, as necessary. The design of the operation stage mitigation measures for the proposed WKCD development and associated local road network should take into account the guidelines published in the *Practice Note for Professional Persons on Drainage Plans Subject to Comment by the Environmental Protection Department* (ProPECC Note PN 5/93).	Throughout operation phase	road drains)					PN 5/93
5.7.2.2	4.2	**Sewage and wastewater effluents from the proposed WKCD development** Domestic sewage generated during operation phase of the proposed WKCD development should be diverted to the foul sewer. Sewage and sewerage impact assessment had identified that the proposed WKCD development would not cause adverse impact to the local sewerage network which should have sufficient capacity to cater for the sewage flow generated from the proposed WKCD development. No mitigation measures and upgrading works to the existing local sewer are necessary for the proposed WKCD development. Recommendations for the design, operation and maintenance for the sewerage system are detailed below in the same table.	Within WKCD site / During operation phase / Throughout operation phase	WKCDA			✓		WPCO
5.7.2.4	4.2	**Emergency effluent bypass from optional sewage pumping station** The following mitigation measures are proposed to be incorporated in the design of the optional sewage pumping station: ▪ A two hour emergency storage capacity should be provided within the optional sewage pump sump accordingly to EPD Environmental Guidance Note for Sewage Pumping Stations	Within WKCD site / During design and operation phases / Throughout operation phase	WKCDA	✓		✓		DSD's Sewerage Manual; EPD Environmental Guidance Note for Sewage Pumping Stations

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
		(NOT a designated project); ▪ Dual power supply or emergency generator with sufficient capacity (100%) should be provided to the optional sewage pump sump to secure electrical power supply; ▪ Standby pumps with sufficient capacity (100%) should be provided to the optional sewage pump sump to ensure smooth operation of the optional sewage pumping station during maintenance of the duty pumps; ▪ An alarm should be installed to signal emergency high water level in the wet well of the optional sewage pumping station; and ▪ Should the optional sewage pumping station is unmanned, a remote monitor system connecting the optional sewage pumping station with the control station through telemetry system should be provided to ensure swift actions to be taken in case of malfunction of the optional sewage pumping station.							
5.7.2.5	4.2	**Improvement works for New Yau Ma Tei Typhoon Shelter (NYMTTS) for Odour Mitigation**							
		▪ Implementation of the DSD's project to install new Dry Weather Flow Interceptor (DWFI) for Cherry Street Box Culvert; and	New Yau Ma Tei Typhoon Shelter / Early 2014 to 2nd half of 2018 (subject to successful bid for funding)	DSD			✓		EIA recommendation
		▪ Improvement of three existing DWFIs upstream of Cherry Street Box Culvert and/or two existing DWFIs upstream of Jordan Road Box Culvert as part of the project titled "Upgrading of West Kowloon and Tsuen Wan Sewerage".	New Yau Ma Tei Typhoon Shelter / 2016 to end 2023 (subject to successful bid for funding)	DSD			✓		EIA recommendation

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
5.7.2.6	4.2	**Water reuse facilities** Regarding collection and treatment of rainwater, individual venue operators should follow Architectural Services Department (ASD) Design Guideline for Rainwater Recycling Installation with typical schematic design of a rainwater recycling installation and recommended recycled rainwater standard with reference to the international standards, such as EPA of USA etc. as detailed in Table 5.12 in the EIA Report during design and operation of the facilities. Chemical treatment and monitoring should be considered for reuse of condensate from air conditioning systems at the detailed design stage. As the demand for reclaimed water is significant, discharge of surplus reclaimed water is not anticipated.	Within WKCD site / During design and operation phases / Throughout operation phase	Individual venue operators; Detailed Design Consultant appointed by WKCDA	✓		✓		ASD Design Guideline for Rainwater Recycling Installation; USEPA Guidelines for water reuse
5.7.2.7		**Thermal / Cooled Water Discharge from District Cooling System** ▪ Monitoring for the spent cooling water discharge from DCWS during operation should follow the requirements as specified in the discharge license to be issued under the WPCO. Details of the water quality monitoring and audit programme and the Event and Action Plan are provided in the stand-alone EM&A Manual.	Within WKCD site / During design and operation phases / Throughout operation phase	Individual venue operators; Detailed Design Consultant appointed by WKCDA	✓		✓		WPCO
Sewerage and Sewage Treatment Implications (Design)									
6.7.1.1	5.1	**General Requirements** The detailed design of the proposed sewerage system should be circulated to DSD, EPD and other relevant parties for comment during planning and detailed design stage to ensure acceptance by relevant parties. Access for plant, equipment and personnel for maintenance of the works should be adequately provided. A	Within WKCD site / During detailed design stage / Prior to commencement of construction	Detailed Design Consultant appointed by WKCDA	✓				DSD's Stormwater Drainage Manual; DSD's Sewerage Manual Part 1 & Part 2; DSD Standard

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		plan showing the maintenance access to the proposed sewers has been provided in Figure 6.5.							Drawings; and HyD's Structures Design Manual for Highways and Railways
6.7.1.2	5.1	**Gravity Sewers** The design of gravity sewers should be according to the guidelines stipulated in Sewerage Manual Part 1. The general requirements are summarized below: ▪ Pipe size: The minimum pipe size of gravity sewer is 225mm in diameter. ▪ Capacity: The gravity sewer should be designed to avoid under surcharge condition. 1m freeboard should be provided if surcharge condition cannot be avoided. ▪ Flow velocity: The flow velocity should be not less than 1m/s under full bore flow for self-cleansing purpose. The maximum velocity should be limited to 3m/s. ▪ Alignment: The alignment of the proposed sewer should be reviewed to avoid conflicting with existing utilities and affecting traffic flow as far as possible. ▪ Hydraulic Design: The detailed hydraulic design should follow the guidelines provided under Section 5.2 of Sewerage Manual Part 1. ▪ Pipe Material: Selection of pipe material shall be based on its suitability for the proposed application. The selection process includes an evaluation of the possible conditions to which the pipes may be exposed in order to specify the appropriate material and installation requirements for the specific application. ▪ Pipe Joints: In order to accommodate differential settlement that may occur between sewers and adjacent	Within WKCD site / During detailed design stage / Prior to commencement of construction	Detailed Design Consultant appointed by WKCDA	✓				DSD's Sewerage Manual Part 1

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
		structures (including manholes), two flexible joints shall be provided in accordance with the latest amendment of General Specification for Civil Engineering Works 2006 Edition Volume 1 Clause 5.71 – Connections to structures in providing the flexible joints to structures. ▪ Pipeline Structural Design: The structural checking and bedding design should in accordance with Section 6 of Sewerage Manual Part 1.							
6.7.1.3	5.1	**Manholes Design** The design of manholes should be in accordance with Section 7 of Sewerage Manual Part 1. ▪ Location: Manholes should be provided at all changes in direction, at intersections and to suit property connections. The maximum spacing between manholes should be as follows: **Diameter of Pipe (mm) — Maximum Intervals (m)** Smaller than 600 — 40 Between 600 – 1050 — 80 Larger than 1050 — 120 ▪ Access Openings/Shafts: Desilting opening should not be smaller than 750mm by 900mm and should be placed in the line of the sewer. The man access opening with minimum size of 675mm x 750mm should be provided at manholes. Man access openings should be placed off the line of the sewer for deep manhole and along the line of the sewer for manholes shallower than 1.2m. ▪ Working Chambers: Working Chambers should be provided to manholes deeper than 1.2m. ▪ Intermediate Platforms: When the invert of a manhole is more than 4.25m from the cover level, intermediate	Within WKCD site / During detailed design stage / Prior to commencement of construction	Detailed Design Consultant appointed by WKCDA	✓				DSD's Sewerage Manual Part 1

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		platforms should be provided at regular intervals. The headroom between platforms should not be less than 2m nor greater than 4m. Hand railing and safety chains should be provided at the edge of platform to protect persons from falling down. The minimum size of platform should is 800mm by 1350mm. ▪ Covers: The manhole cover should be designed strong enough to take the design loading and should not rock when initially placed in position or develop a rock with wear. The design of manhole covers should make reference to DSD standard drawings. ▪ Backdrop Manhole: When the level difference between the inlet pipe and the invert level of manhole is greater than 600mm, backdrop manhole should be used. The design of backdrop manhole should follow guidelines under Section 7.1.9 in Sewerage Manual Part 1. ▪ Step-irons/Cat Ladder: Step-irons should be securely fixed in position and should be equally spaced and staggered about a vertical line at 300mm centres. Cat ladders should be used in manholes deeper than 4.25m or where manholes are frequently entered. Set-irons and ladders should be start at not more than 600mm below the cover level and continue to the platform or benching. Corrosion resistance materials should be used if step-irons and ladders are constantly in a damp atmosphere and prone to corrosion.							
6.7.1.4	5.1	**Sump Pumps Design** The design of sewage sump pumps should follow the requirements stipulated in the Sewerage Manual Part 2. ▪ The number of pumps to be installed depends on the sump capacity. Standby pumps should be provided to ensure the operation can still be maintained during maintenance or	Within WKCD site / During detailed design stage / Prior to commencement of construction	Detailed Design Consultant appointed by WKCDA	✓				DSD's Sewerage Manual Part 2

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		mechanical failure. ▪ The selected electrical equipment shall be suitable to operate under high humidity, high temperature and presence of corrosive gases. ▪ Appropriate mitigation measures to control noise and odour problems should be designed under detailed design stage. The typical methods for noise and odour control could refer to the Seweage Manual Part 2. ▪ In order to control the septicity of sewage due to operation of sewage pumping facilities, the retention time of sewage should be minimized. Pumps with different small rate should be considered for reducing the time of retention of sewage. Direct injection of oxygen could also be used to control septicity. The mitigation methods should be considered under detailed design stage. ▪ Fresh water should be provided for the operation and maintenance staff for hygienic reasons.							
6.7.1.5	5.1	**Rising Mains Design** The design of rising main should follow the requirement stipulated in the Sewerage Manual Part 2. Twin rising mains should be provided as far as possible because of the following reasons: ▪ To accommodate a wide range of flow conditions such that the velocity in the mains can be kept within acceptable limits; ▪ To provide continued operation when one of the mains is damaged; and ▪ To facilities future inspection and maintenance while the normal sewage flow can be maintained. The maximum velocity at peak flow should not exceed 3m/s. The	Within WKCD site / During detailed design stage / Prior to commencement of construction	Detailed Design Consultant appointed by WKCDA	✓				DSD's Sewerage Manual Part 2

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		desirable range of velocity should be 1m/s to 2m/s with due consideration given to the various combinations of number of duty pumps in operation. Air relief valves, check valves, isolating valves and discharge sumps shall be provided in accordance to the Sewerage Manual Part 2. Septicity control methods for rising mains, such as oxygen injection and reducing retention time of sewage, should be designed under detailed design stage.							
6.7.1.6	5.1	**Thrust Blocks for Rising Mains** Thrust blocks should be provided to rising mains to prevent pipes from being moved by forces exerted within the pipe by the flow of water hitting bends, tapers, and closed or partially closed valves. The size of a thrust block is dependent upon the deflection of the flow and the head of water inside the pipe. Design of thrust block should refer to DSD Sewerage Manual Part 2.	Within WKCD site / During detailed design stage / Prior to commencement of construction	Detailed Design Consultant appointed by WKCDA	✓				DSD's Sewerage Manual Part 2
Sewerage and Sewage Treatment Implications (Operation)									
6.7.1.7	5.2	**Inspection and General Maintenance Operations** All gravity sewers and rising mains shall be tested in accordance with relevant General Specification sections as appropriate in the presence and to the satisfaction of the staff of DSD upon completion of the installation. Records of satisfactory testing on the completed works shall be submitted to DSD after the testing. CCTV survey records, as-built drawings and hydraulic and structural design calculations should be submitted to DSD for records.	Within WKCD site / From several days to several weeks / Upon completion of installation	WKCDA			✓		CEDD's General Specification for Civil Engineering Works
Waste Management Implications (Construction)									
7.5.1.1	6.1	**Good Site Practices** Recommendations for good site practices during the	WKCD construction site / Throughout construction	Contractor appointed by		✓			Waste Disposal Ordinance; Waste

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
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		construction activities include: ▪ Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site ▪ Training of site personnel in proper waste management and chemical handling procedures ▪ Provision of sufficient waste disposal points and regular collection of waste ▪ Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by either covering trucks or by transporting wastes in enclosed containers ▪ Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction to public roads ▪ Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting the inert or non-inert C&D materials is not anticipated	stage / Until completion of all construction activities	WKCDA					Disposal (Chemical Wastes) (General) Regulation; and Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site
7.5.1.2	6.1	**Waste Reduction Measures** Recommendations to achieve waste reduction include: ▪ Sort inert C&D material to recover any recyclable portions such as metals ▪ Segregation and storage of different types of waste in different containers or skips to enhance reuse or recycling of materials and their proper disposal ▪ Encourage collection of recyclable waste such as waste paper and aluminium cans by providing separate labelled bins to enable such waste to be segregated from other general refuse generated by the work force ▪ Proper site practices to minimise the potential for damage or	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by WKCDA		✓			Waste Disposal Ordinance

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		contamination of inert C&D materials ▪ Plan the use of construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste							
7.5.1.3	6.1	**Inert and Non-inert C&D Materials** In order to minimise impacts resulting from collection and transportation of inert C&D material for off-site disposal, the excavated materials should be reused on-site as fill material as far as practicable. In addition, inert C&D material generated from excavation works could be reused as fill materials in local projects that require public fill for reclamation. ▪ The surplus inert C&D material will be disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong. ▪ Liaison with the CEDD Public Fill Committee (PFC) on the allocation of space for disposal of the inert C&D materials at PFRF is underway. No construction work is allowed to proceed until all issues on management of inert C&D materials have been resolved and all relevant arrangements have been endorsed by the relevant authorities including PFC and EPD. ▪ The C&D materials generated from general site clearance should be sorted on site to segregate any inert materials for reuse or disposal of at PFRFs whereas the non-inert materials will be disposed of at the designated landfill site. ▪ In order to monitor the disposal of inert and non-inert C&D materials at respectively PFRFs and the designated landfill site, and to control fly-tipping, it is recommended that the Contractor should follow the Technical Circular (Works) No.6/2010 for Trip Ticket System for Disposal of Construction & Demolition Materials issued by Development Bureau. In addition, it is also recommended that the	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by WKCDA		✓			Waste Disposal Ordinance ; Technical Circular (Works) No.6/2010 for Trip Ticket System for Disposal of Construction & Demolition Materials; and Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		Contractor should prepare and implement a Waste Management Plan detailing their various waste arising and waste management practices in accordance with the relevant requirements of the Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site.							
7.5.1.4	6.1	**Chemical Waste** If chemical wastes are produced at the construction site, the Contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the "Code of Practice on the Packaging Labelling and Storage of Chemical Wastes". Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor should use a licensed collector to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. Potential environmental impacts arising from the handling activities (including storage, collection, transportation and disposal of chemical waste) are expected to be minimal with the implementation of appropriate mitigation measures as recommended.	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by WKCDA		✓			Code of Practice on the Packaging Labelling and Storage of Chemical Wastes; Waste Disposal (Chemical Waste) (General) Regulation
7.5.1.5	6.1	**General Refuse** General refuse should be stored in enclosed bins or compaction units separated from inert C&D materials. A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from inert C&D materials. Preferably an enclosed and covered area should be	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by WKCDA		✓			Waste Disposal Ordinance and Public Health and Municipal Services Ordinance - Public Cleansing and

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		provided to reduce the occurrence of 'wind blown' light material.							Prevention of Nuisances Regulation
Waste Management Implications (Operation)									
7.5.2.1	6.2	**General Refuse** General refuse should be collected on daily basis and delivered to the refuse collection point accordingly. A reputable waste collector should be employed to remove general refuse regularly to avoid odour nuisance or pest/vermin problem. Sufficient recycling containers are recommended to be provided at suitable locations of the WKCD site to encourage recycling of such waste as aluminium cans, plastics and waste paper.	WKCD site / On a regular basis / Throughout operation stage	Private Developer (for land sale lots); Relevant Government Departments e.g. FEHD / LCSD (for Government / public facilities) WKCDA (for WKCDA facilities)			✓		Waste Disposal Ordinance and Public Health and Municipal Services Ordinance - Public Cleansing and Prevention of Nuisances Regulation
7.5.2.2	6.2	**Chemical Waste** If chemical wastes are expected to be produced during the operation phase, the Project Proponent should register with the EPD as a chemical waste producer and follow the guidelines stated in the “Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes”. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. Licensed collector should be deployed to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	WKCD site / On a regular basis / Throughout operation stage	Private Developer (for land sale lots); Relevant Government Departments e.g. FEHD / LCSD (for Government / public facilities) WKCDA (for WKCDA facilities)			✓		Code of Practice on the Packaging Labelling and Storage of Chemical Wastes; Waste Disposal (Chemical Waste) (General) Regulation

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
Land Contamination (Construction)									
8.6	7.1	The potential for land contamination issues at the TST Fire Station due to its future relocation will be confirmed by site investigation after land acquisition. Where necessary, mitigation measures for minimising potential exposure to contaminated materials (if any) or remediation measures will be identified. If contaminated land is identified (e.g., during decommissioning of fuel oil storage tanks) after the commencement of works, mitigation measures are proposed in order to minimise the potentially adverse effects on the health and safety of construction workers and impacts arising from the disposal of potentially contaminated materials. The following measures are proposed for excavation and transportation of contaminated material: ▪ To minimize the chance for construction workers to come into contact with any contaminated materials, bulk earth-moving excavation equipment should be employed; ▪ Contact with contaminated materials can be minimised by wearing appropriate clothing and personal protective equipment such as gloves and masks (especially when interacting directly with contaminated material), provision of washing facilities and prohibition of smoking and eating on site; ▪ Stockpiling of contaminated excavated materials on site should be avoided as far as possible; ▪ The use of contaminated soil for landscaping purpose should be avoided unless pre-treatment was carried out; ▪ Vehicles containing any contaminated excavated materials should be suitably covered to reduce dust emissions and/or release of contaminated wastewater; ▪ Truck bodies and tailgates should be sealed to stop any	Site of the existing Tsim Sha Tsui Fire Station / During excavation activities / Prior to construction of WKCD facilities	Contractor appointed by WKCDA		✓			Waste Disposal Ordinance; and Waste Disposal (Chemical Waste) (General) Regulation

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
		discharge; ▪ Only licensed waste haulers should be used to collect and transport contaminated material to treatment/disposal site and should be equipped with tracking system to avoid fly tipping; ▪ Speed control for trucks carrying contaminated materials should be exercised; ▪ Observe all relevant regulations in relation to waste handling, such as Waste Disposal Ordinance (Cap 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap 354) and obtain all necessary permits where required; and ▪ Maintain records of waste generation and disposal quantities and disposal arrangements.							
Land Contamination (Operation)									
		No mitigation measure is required.							
Ecological Impact (Construction)									
		No mitigation measure is required.							
Ecological Impact (Operation)									
		No mitigation measure is required.							
Landscape and Visual Impact (Construction)									
Table 10.18 (CM1)	Table 9.1 (CM1)	Trees should be retained in situ on site as far as possible. Should tree removal be unavoidable due to construction impacts, trees will be transplanted or felled with reference to the stated criteria in the Tree Removal Applications to be submitted to relevant government departments for approval in accordance to ETWB TCW No. 29/2004 and 3/2006.	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by WKCDA	✓	✓			ETWB TCW No. 29/2004 and 3/2006
Table 10.18	Table 9.1	Compensatory tree planting shall be incorporated to the proposed project and maximize the new tree, shrubs and other vegetation planting to compensate tree felled and vegetation	WKCD Park and public areas / After completion of site formation / Prior to	Contractor appointed by	✓	✓			ETWB TCW No. 3/2006

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
(CM2)	(CM2)	removed. Also, implementation of compensatory planting should be of a ratio not less than 1:1 in terms of quality and quantity within the site.	operation stage	WKCDA					
Table 10.18 (CM3)	Table 9.1 (CM3)	Buffer trees for screening purposes to soften the hard architectural and engineering structures and facilities.	Alongside superstructures within WKCD / After completion of superstructure construction / Prior to operation stage	Contractor appointed by WKCDA	✓	✓			EIAO-TM
Table 10.18 (CM4)	Table 9.1 (CM4)	Softscape treatments such as vertical green wall panel /planting of climbing and/or weeping plants, etc, to maximize the green coverage and soften the hard architectural and engineering structures and facilities.	Alongside superstructures within WKCD / After completion of road and street construction / Prior to operation stage	Detailed Design Consultant / Contractor appointed by WKCDA	✓	✓			EIAO-TM
Table 10.18 (CM5)	Table 9.1 (CM5)	Roof greening by means of intensive and extensive green roof to maximize the green coverage and improve aesthetic appeal and visual quality of the building/structure.	WKCD structures / After completion of superstructure construction / Prior to operation stage	Detailed Design Consultant / Contractor appointed by WKCDA	✓	✓			EIAO-TM
Table 10.18 (CM6)	Table 9.1 (CM6)	Sensitive streetscape design should be incorporated along all new roads and streets.	Alongside roads and streets within WKCD / After completion of structure construction / Prior to operation stage	Detailed Design Consultant / Contractor appointed by WKCDA	✓	✓			EIAO-TM
Table 10.18 (CM7)	Table 9.1 (CM7)	Structure, ornamental planting shall be provided along amenity strips to enhance the landscape quality.	Alongside superstructures within WKCD/ After completion of superstructure construction / Prior to operation stage	Contractor appointed by WKCDA	✓	✓			EIAO-TM

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
Table 10.18 (CM8)	Table 9.1 (CM8)	Landscape design shall be incorporated to architectural and engineering structures in order to provide aesthetically pleasing designs.	WKCD structures / After completion of structure construction / Prior to operation stage	Detailed Design Consultant / Contractor appointed by WKCDA	✓	✓			EIAO-TM
Table 10.18 (CM9)	Table 9.1 (CM9)	Minimize the structure of marine facilities to built on the seabed and foreshore in order to minimize the affected extent to the waterbody	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Detailed Design Consultant / Contractor appointed by WKCDA	✓	✓			EIAO-TM
Table 10.22 (MCP1)	Table 9.2 (MCP1)	Use of decorative screen hoarding/boards	WKCD construction sites / Throughout construction stage / Prior to operation stage	Contractor appointed by WKCDA		✓			ETWB TCW No. 3/2006
Table 10.22 (MCP2)	Table 9.2 (MCP2)	Early introduction of landscape treatments	WKCD construction sites / Towards the end of construction stage / Prior to operation stage	Contractor appointed by WKCDA		✓			EIAO-TM
Table 10.22 (MCP3)	Table 9.2 (MCP3)	Adoption of light colour for the temporary ventilation shafts for the basement during the transition period.	WKCD basement construction sites / After completion of ventilation shaft superstructure / Prior to operation stage	Design Architect / Contractor appointed by WKCDA	✓	✓			EIAO-TM
Table 10.22 (MCP4)	Table 9.2 (MCP4)	Control of night time lighting	WKCD construction sites / During night time / Throughout construction stage	Contractor appointed by WKCDA		✓			EIAO-TM
Table 10.22 (MCP5)	Table 9.2 (MCP5)	Use of greenery such as grass cover for the temporary open areas will help achieve the visual balance and soften the hard edges of the structures.	WKCD temporary open areas / Throughout construction stage / Prior to operation stage	Contractor appointed by WKCDA		✓			EIAO-TM

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
Landscape and Visual Impact (Operation)									
Table 10.19 (OM1)	Table 9.3 (OM1)	Provide proper planting maintenance on the new planting areas to enhance the aesthetic design degree	WKCD open areas / Throughout operation phase / As-needed basis	Private Developer (for land sale lots); LCSD (for roadside planting) WKCDA (for all other WKCD areas)			✓		EIAO-TM
Table 10.19 (OM2)	Table 9.3 (OM2)	Provision of open space in various forms and at different levels on or above ground, including park, waterfront promenade, piazzas and terrace garden and associated green connections for public enjoyment.	WKCD open areas / Throughout operation phase / As-needed basis	Private Developer (for land sale lots); LCSD (for roadside planting) WKCDA (for all other WKCD areas)	✓		✓		EIAO-TM
Table 10.23 (GDF1)	Table 9.4 (GDF1)	**Control of Development Heights and Massing and Distinctive Architectural Design)** With well designed low to medium-rise buildings, the proposed WKCD development is anticipated to be highly compatible with the surroundings.	WKCD buildings / During design stage / Throughout operation phase	Design Architect / Contractor appointed by WKCDA	✓		✓		EIAO-TM
Table 10.23 (GDF2)	Table 9.4 (GDF2)	**Creation of View Corridor** The buildings on the WKCD are designed to allow visual permeability from the WKT to Victoria Harbour, which is achieved by alignment of the buildings on the WKCD site.	WKCD buildings / During design stage / Throughout operation phase	Design Architect appointed by WKCDA	✓		✓		EIAO-TM
Table 10.23 (GDF3)	Table 9.4 (GDF3)	**Preservation of Open Vista from the Heritage Sites** An open vista and green corridor from the heritage sites consisting of the declared monuments of St. Andrew's Church, former Kowloon British School (now Antiques and Monuments Office) and Hong Kong Observatory through Kowloon Park, and along the WKCD waterfront promenade towards the Victoria	WKCD open areas / During design stage / Throughout operation phase	Design Consultant appointed by WKCDA / WKCDA	✓		✓		EIAO-TM

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		Harbour is preserved.							
Table 10.23 (GDF4)	Table 9.4 (GDF4)	**Provision of Open Space** The open space will be provided in various forms at grade in the WKCD, including piazzas, a landscaped waterfront promenade and various green spaces.	WKCD open areas / During design stage / Throughout operation phase	Design Architect / Contractor appointed by WKCDA	✓		✓		EIAO-TM
Table 10.23 (GDF5)	Table 9.4 (GDF5)	**Provision of Terrace Gardens** The unique designed terrace gardens are considered as a good design feature to lessen the visual impacts and provide new visual resources when viewed from the VSRs at higher levels.	WKCD open areas / During design stage / Throughout operation phase	Private Developer (for land sale lots); WKCDA (for WKCD facilities)	✓		✓		EIAO-TM
Table 10.23 (MOP1)	Table 9.4 (MOP1)	Undulating berms and the trees planted in the surroundings of the existing WHC and MTR ventilation buildings.	Around existing ventilation buildings within WKCD / During construction of WKCD Park / Throughout operation phase	Contractor appointed by WKCDA			✓		EIAO-TM
Table 10.23 (MOP2)	Table 9.4 (MOP2)	Clusters of shade planting and appropriate landscaping are designed to provide a relaxing waterfront environment, soften the water edge and helps mitigate the visual impacts associated with the existing WHC and MTR ventilation buildings.	WKCD waterfront / During design stage / Throughout operation phase	Landscape Architect / Contractor appointed by WKCDA	✓		✓		EIAO-TM
Table 10.23 (MOP3)	Table 9.4 (MOP3)	The unique designed roof top gardens and green roof are considered as mitigation measures to lessen the visual impacts and provide new visual resources when viewed from the VSRs at higher levels.	WKCD open areas / During design stage / Throughout operation phase	Private Developer (for land sale lots); WKCDA (for WKCD facilities)	✓		✓		EIAO-TM
Table 10.23 (MOP4)	Table 9.4 (MOP4)	Buffer trees for screening purposes or other softscape treatments such as vertical green wall / climbers / green roof / vertical greening shall be incorporated to soften the hard architectural and engineering structures and facilities.	Alongside superstructures within WKCD / After completion of superstructure construction / Throughout operation	Private Developer (for land sale lots); WKCDA (for WKCD facilities)			✓		EIAO-TM

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
			stage						
Table 10.23 (MOP5)	Table 9.4 (MOP5)	Use of natural colour tones (e.g. green colour) for wind turbines located along the waterfont, to make them visually more compatible with the surroundings.	WKCD waterfront / During design stage / Throughout operation phase	Design Architect / Contractor appointed by WKCDA	✓		✓		EIAO-TM
Table 10.23 (MOP 6)	Table 9.4 (MOP 6)	Appropriate positioning and angling of the solar panels to avoid significant visual impacts on the VSRs located at upper levels in close proximity.	WKCD building rooftops / During daytime / Throughout operation stage	Private Developer (for land sale lots); WKCDA (for WKCD facilities)	✓		✓		EIAO-TM
Table 10.23 (MOP 7)	Table 9.4 (MOP 7)	Aesthetic design of roads and streetscapes	Along WKCD roads and streets / During design stage / Throughout operation phase	Design Architect / Contractor appointed by WKCDA	✓		✓		EIAO-TM
Table 10.23 (MOP 8)	Table 9.4 (MOP 8)	Human scale design for the WKT Plaza and the Intersection of Canton Road and Austin Road West	WKT Plaza intersection with WKCD / During design stage / Throughout operation phase	Design Architect / Contractor appointed by WKCDA / MTRC	✓		✓		EIAO-TM
Table 10.23 (MOP 9)	Table 9.4 (MOP 9)	Night time lighting control measures such as the use of sensors and timers could help reduce usage after hours.	WKCD building exterior and open areas / During night time / Throughout operation stage	Private Developer (for land sale lots); WKCDA (for WKCD facilities)			✓		EIAO-TM

Appendix D. Implementation Schedule for Environmental Mitigation Measures on Underpass Road Serving the Planned WKCD

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
Air Quality Impact (Construction)									
14.3.6.1	10.3.1	**General Dust Control Measures** Frequent water spraying for active construction areas (12 times a day or once every one hour), including Heavy construction activities such as construction of buildings or roads, drilling, ground excavation, cut and fill operations (i.e., earth moving)	Within WKCD site / Duration of the construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIA Recommendation and Air Pollution Control (Construction Dust) Regulation
14.3.6.1	10.3.1	**Best Practice For Dust Control** The relevant best practices for dust control as stipulated in the Air Pollution Control (construction Dust) Regulation should be adopted to further reduce the construction dust impacts from the Project. These best practices include: *Good Site Management* ▪ Good site management is important to help reducing potential air quality impact down to an acceptable level. As a general guide, the Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimise the release of visible dust emission. Any piles of materials accumulated on or around the work areas should be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimising generation of fugitive dust emissions. The material should be handled properly to prevent fugitive dust emission before cleaning. *Disturbed Parts of the Roads* ▪ Each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates	Within WKCD site / Duration of the construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIA Recommendation and Air Pollution Control (Construction Dust) Regulation

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		and kept clear of dusty materials; or ■ Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet. *Exposed Earth* ■ Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies. *Loading, Unloading or Transfer of Dusty Materials* ■ All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet. *Debris Handling* ■ Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides. ■ Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped. *Transport of Dusty Materials* ■ Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards. *Wheel washing* ■ Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. *Use of vehicles* ■ The speed of the trucks within the site should be controlled								

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		to about 10km/hour in order to reduce adverse dust impacts and secure the safe movement around the site. ▪ Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. ▪ Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle. *Site hoarding* ▪ Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit.						
14.3.6.1	10.3.1	**Best Practicable Means for Cement Works (Concrete Batching Plant)** The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93) should be followed and implemented to further reduce the construction dust impacts of the Project. These best practices include: Exhaust from Dust Arrestment Plant ▪ Wherever possible the final discharge point from particulate matter arrestment plant, where is not necessary to achieve dispersion from residual pollutants, should be at low level to minimise the effect on the local community in the case of abnormal emissions and to facilitate maintenance and inspection	Within WKCD site / Duration of the construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIA recommendation; Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		Emission Limits ▪ All emissions to air, other than steam or water vapour, shall be colourless and free from persistent mist or smoke Engineering Design/Technical Requirements ▪ As a general guidance, the loading, unloading, handling and storage of fuel, raw materials, products, wastes or by-products should be carried out in a manner so as to prevent the release of visible dust and/or other noxious or offensive emissions							
Air Quality Impact (Operation)									
		No mitigation measure is required.							
Noise Impact (Construction)									
14.4.7.1	10.4.1	**Good Site Practice** Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during each phase of construction: ▪ only well-maintained plant to be operated on-site and plant should be serviced regularly during the construction works; ▪ machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum; ▪ plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs; ▪ mobile plant should be sited as far away from NSRs as possible; and ▪ material stockpiles and other structures to be effectively	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIAO and Noise Control Ordinance

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		utilised, where practicable, to screen noise from on-site construction activities.							
14.4.7.1	10.4.1	**Adoption of Quieter PME** The recommended quieter PME adopted in the assessment were taken from EPD's QPME Inventory and "*Sound Power Levels of Other Commonly Used PME*". It should be noted that the silenced PME can be found in Hong Kong.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIAO and Noise Control Ordinance
14.4.7.1	10.4.1	**Use of Movable Noise Barriers** Movable noise barriers can be very effective in screening noise from particular items of plant when constructing the Project. Noise barriers located along the active works area close to the noise generating component of a PME could produce at least 10 dB(A) screening for stationary plant and 5 dB(A) for mobile plant provided the direct line of sight between the PME and the NSRs is blocked.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIAO and Noise Control Ordinance
14.4.7.1	10.4.1	**Use of Noise Enclosure/ Acoustic Shed** The use of noise enclosure or acoustic shed is to cover stationary PME such as air compressor and concrete pump. With the adoption of the noise enclosure, the PME could be completely screened, and noise reduction of 15 dB(A) can be achieved according to the EIAO Guidance Note No.9/2010.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIAO and Noise Control Ordinance
14.4.7.1	10.4.1	**Use of Noise Insulating Fabric** Noise insulating fabric can also be adopted for certain PME (e.g. drill rig, pilling machine etc). The fabric should be lapped such that there are no openings or gaps on the joints. According to the approved Tsim Sha Tsui Station Northern Subway EIA report (AEIAR-127/2008), a noise reduction of 10 dB(A) can be achieved for the PME lapped with the noise insulating fabric.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIAO and Noise Control Ordinance
14.4.7.1	10.4.1	**Scheduling of Construction Works outside School Examination Periods** During construction phase, the contractor should liaise with the educational institutions (including NSRs LCS and CRGPS) to obtain the examination schedule and avoid the noisy	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIAO and Noise Control Ordinance

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		construction activities during school examination periods.							
Noise Impact (Operation)									
14.4.7.2	10.4.2	**Road Traffic Noise** Sound-absorbing materials should be installed on inner walls and ceilings of the underpass at the portals at the junction of Lin Cheung Road and Austin Road West, interim access of Austin Road West and permanent access at Canton Road. The sound-absorbing materials would be extended at least 30m into the underpass at the portals.	Portal at the junction of Lin Cheung Road and Austin Road West, Interim Access at Austin Road West and Permanent access at Canton Road / Before commencement of operation of road project	Contractor appointed by WKCDA / Highways Department	✓	✓	✓		EIAO
14.4.7.2	10.4.2	**Fixed Plant Noise** Specification of the maximum allowable sound power levels of the proposed fixed plants during daytime and night-time should be followed. The following noise reduction measures shall be considered as far as practicable during operation: ▪ Choose quieter plant such as those which have been effectively silenced; ▪ Include noise levels specification when ordering new plant (including chillier and E/M equipment); ▪ Locate fixed plant/louvre away from any NSRs as far as practicable; ▪ Locate fixed plant in walled plant rooms or in specially designed enclosures; ▪ Locate noisy machines in a basement or a completely separate building; ▪ Install direct noise mitigation measures including silencers, acoustic louvres and acoustic enclosure where necessary; and	Within WKCD site / During operation phase / Throughout operation phase	Design Architect / Contractor appointed by WKCDA	✓		✓		EIAO and Noise Control Ordinance

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		▪ Develop and implement a regularly scheduled plant maintenance programme so that equipment is properly operated and serviced in order to maintain a controlled level of noise.							
Water Quality Impact (Construction)									
14.5.5.1	10.5.1	**Construction site runoff and drainage** The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended to protect water quality and sensitive uses of the coastal area, and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impacts: ▪ 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, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities. The design of the temporary on-site drainage system should be undertaken by the WKCDA's Contractor prior to the commencement of construction; ▪ Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the WKCDA's Contractor prior to the commencement of construction. ▪ All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to	Within WKCD site / Duration of the construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			ProPECC Note PN 1/94

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. ▪ Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities. ▪ 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 facility should be provided at construction site exit where practicable. Wash-water should have sand and silt settled out and removed regularly 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. ▪ Open stockpiles of construction materials or construction wastes on-site 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 be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and stormwater runoff being directed into foul sewers.							

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		▪ Precautions should be taken at any time of the year when rainstorms are likely. Actions should be taken when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC Note 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. ▪ Bentonite slurries used in piling or slurry walling should be reconditioned and reused wherever practicable. Temporary enclosed storage locations 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 Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.							
14.5.5.1	10.5.1	**Barging facilities and activities** Recommendations for good site practices during operation of the proposed barging point include: ▪ All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; ▪ Loading of barges and hoppers should be controlled to prevent splashing of material into the surrounding water. Barges or hoppers should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation; ▪ All hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; and ▪ Construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			WPCO

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
14.5.5.1	10.5.1	**Sewage effluent from construction workforce** Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor		✓			ProPECC Note PN 1/94
14.5.5.1	10.5.1	**General construction activities** Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby storm water drain. Stockpiles of cement and other construction materials should be kept covered when not being used. Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby storm water drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			ProPECC Note PN 1/94
Water Quality Impact (Operation)									
14.5.5.2	10.5.2	**Road and surface runoff** For operation of the proposed WKCD development and associated local road network, a surface water drainage system would be provided to collect road and surface runoff. It is recommended that the road drainage should be provided with adequately designed silt trap and oil interceptors, as necessary. The design of the operation stage mitigation measures for the proposed WKCD development and associated local road network should take into account the guidelines published in the Practice Note for Professional Persons on Drainage Plans Subject to Comment by the *Environmental Protection*	Within WKCD site / During operation phase / Throughout operation phase	To be agreed between DSD and WKCDA prior to commencement of operation			✓		ProPECC Note PN 5/93, *Highways Department Guidance Notes RD/GN/035*

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
		Department (ProPECC Note PN 5/93) and *Highways Department Guidance Notes RD/GN/035 – Road Pavement Drainage Design*.							
Sewerage and Sewage Treatment Implications (Design)									
		No mitigation measure is required.							
Sewerage and Sewage Treatment Implications (Operation)									
		No mitigation measure is required.							
Waste Management Implications (Construction)									
14.7.4.1	10.7.1	**Good Site Practices** Recommendations for good site practices during the construction activities include: ▪ Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site ▪ Training of site personnel in proper waste management and chemical handling procedures ▪ Provision of sufficient waste disposal points and regular collection of waste ▪ Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by either covering trucks or by transporting wastes in enclosed containers ▪ Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction to public roads ▪ Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting the inert or non-inert C&D materials is not anticipated	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by WKCDA		✓			Waste Disposal Ordinance; Waste Disposal (Chemical Wastes) (General) Regulation; and Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
14.7.4.1		**Waste Reduction Measures** Recommendations to achieve waste reduction include: ▪ Sort inert C&D material to recover any recyclable portions such as metals ▪ Segregation and storage of different types of waste in different containers or skips to enhance reuse or recycling of materials and their proper disposal ▪ Encourage collection of recyclable waste such as waste paper and aluminium cans by providing separate labelled bins to enable such waste to be segregated from other general refuse generated by the work force ▪ Proper site practices to minimise the potential for damage or contamination of inert C&D materials ▪ Plan the use of construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by WKCDA		✓			Waste Disposal Ordinance
14.7.4.1	10.7.1	**Inert and Non-inert C&D Materials** In order to minimise impacts resulting from collection and transportation of inert C&D material for off-site disposal, the excavated materials should be reused on-site as fill material as far as practicable. In addition, inert C&D material generated from excavation works could be reused as fill materials in local projects that require public fill for reclamation. ▪ The surplus inert C&D material will be disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong. ▪ Liaison with the CEDD Public Fill Committee (PFC) on the allocation of space for disposal of the inert C&D materials at PFRF is underway. No construction work is allowed to proceed until all issues on management of inert C&D	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by WKCDA		✓			Waste Disposal Ordinance ; Technical Circular (Works) No.6/2010 for Trip Ticket System for Disposal of Construction & Demolition Materials; and Technical Circular (Works) No. 19/2005 Environmental Management on

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		materials have been resolved and all relevant arrangements have been endorsed by the relevant authorities including PFC and EPD. ▪ The C&D materials generated from general site clearance should be sorted on site to segregate any inert materials for reuse or disposal of at PFRFs whereas the non-inert materials will be disposed of at the designated landfill site. ▪ In order to monitor the disposal of inert and non-inert C&D materials at respectively PFRFs and the designated landfill site, and to control fly-tipping, it is recommended that the Contractor should follow the Technical Circular (Works) No.6/2010 for Trip Ticket System for Disposal of Construction & Demolition Materials issued by Development Bureau. In addition, it is also recommended that the Contractor should prepare and implement a Waste Management Plan detailing their various waste arising and waste management practices in accordance with the relevant requirements of the Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site.							Construction Site
14.7.4.1	10.7.1	**Chemical Waste** If chemical wastes are produced at the construction site, the Contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the "Code of Practice on the Packaging Labelling and Storage of Chemical Wastes". Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor should use a licensed collector to transport and dispose of the chemical wastes at the	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by WKCDA		✓			Code of Practice on the Packaging Labelling and Storage of Chemical Wastes; Waste Disposal (Chemical Waste) (General) Regulation

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. Potential environmental impacts arising from the handling activities (including storage, collection, transportation and disposal of chemical waste) are expected to be minimal with the implementation of appropriate mitigation measures as recommended.							
14.7.4.1	10.7.1	**General Refuse** General refuse should be stored in enclosed bins or compaction units separated from inert C&D material. A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from inert C&D material. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by WKCDA		✓			Waste Disposal Ordinance and Public Health and Municipal Services Ordinance - Public Cleansing and Prevention of Nuisances Regulation
Waste Management Implications (Operation)									
		No mitigation measure is required.							
Land Contamination (Construction)									
14.8.5	10.8.1	The potential for land contamination issues at the TST Fire Station due to its future relocation will be confirmed by site investigation after land acquisition. Where necessary, mitigation measures for minimising potential exposure to contaminated materials (if any) or remediation measures will be identified. If contaminated land is identified (e.g., during decommissioning of fuel oil storage tanks) after the commencement of works, mitigation measures are proposed in order to minimise the potentially adverse effects on the health and safety of construction workers and impacts arising from the disposal of potentially contaminated materials.	Site of the existing Tsim Sha Tsui Fire Station / During excavation activities / Prior to construction of WKCD facilities	Contractor appointed by WKCDA		✓			Waste Disposal Ordinance; and Waste Disposal (Chemical Waste) (General) Regulation

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		The following measures are proposed for excavation and transportation of contaminated material: ■ To minimize the chance for construction workers to come into contact with any contaminated materials, bulk earth-moving excavation equipment should be employed; ■ Contact with contaminated materials can be minimised by wearing appropriate clothing and personal protective equipment such as gloves and masks (especially when interacting directly with contaminated material), provision of washing facilities and prohibition of smoking and eating on site; ■ Stockpiling of contaminated excavated materials on site should be avoided as far as possible; ■ The use of contaminated soil for landscaping purpose should be avoided unless pre-treatment was carried out; ■ Vehicles containing any contaminated excavated materials should be suitably covered to reduce dust emissions and/or release of contaminated wastewater; ■ Truck bodies and tailgates should be sealed to stop any discharge; ■ Only licensed waste haulers should be used to collect and transport contaminated material to treatment/disposal site and should be equipped with tracking system to avoid fly tipping; ■ Speed control for trucks carrying contaminated materials should be exercised; ■ Observe all relevant regulations in relation to waste handling, such as Waste Disposal Ordinance (Cap 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap 354) and obtain all necessary permits where required; and ■ Maintain records of waste generation and disposal quantities							

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
		and disposal arrangements.							
Land Contamination (Operation)									
		No mitigation measure is required.							
Ecological Impact (Construction)									
		No mitigation measure is required.							
Ecological Impact (Operation)									
		No mitigation measure is required.							
Landscape and Visual Impact (Construction)									
Table 14.10.17 (CM1)	Table 10.8 (CM1)	Trees should be retained in situ on site as far as possible. Should tree removal be unavoidable due to construction impacts, trees will be transplanted or felled with reference to the stated criteria in the Tree Removal Applications to be submitted to relevant government departments for approval in accordance to ETWB TCW No. 29/2004 and 3/2006.	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by WKCDA	✓	✓			ETWB TCW No. 29/2004 and 3/2006
Table 14.10.17 (CM2)	Table 10.8 (CM2)	Compensatory tree planting shall be incorporated to the proposed project and maximize the new tree, shrubs and other vegetation planting to compensate tree felled and vegetation removed. Also, implementation of compensatory planting should be of a ratio not less than 1:1 in terms of quality and quantity within the site.	WKCD Park and public areas / After completion of site formation / Prior to operation stage	Contractor appointed by WKCDA	✓	✓			ETWB TCW No. 3/2006
Table 14.10.17 (CM3)	Table 10.8 (CM3)	Buffer trees for screening purposes to soften the hard architectural and engineering structures and facilities.	Alongside superstructures within WKCD / After completion of superstructure construction / Prior to operation stage	Contractor appointed by WKCDA	✓	✓			EIAO-TM
Table 14.10.17	Table 10.8 (CM4)	Softscape treatments such as vertical green wall panel /planting of climbing and/or weeping plants, etc, to maximize the green coverage and soften the hard architectural and engineering	Alongside superstructures within WKCD / After completion	Design Consultant / Contractor appointed by	✓	✓			EIAO-TM

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
(CM4)		structures and facilities.	of superstructure construction / Prior to operation stage	WKCDA					
Table 14.10.17 (CM5)	Table 10.8 (CM5)	Roof greening by means of intensive and extensive green roof to maximize the green coverage and improve aesthetic appeal and visual quality of the building/structure.	Alongside superstructures within WKCD / After completion of superstructure construction / Prior to operation stage	Design Consultant / Contractor appointed by WKCDA	✓	✓			EIAO-TM
Table 14.10.17 (CM6)	Table 10.8 (CM6)	Sensitive streetscape design should be incorporated along all new roads and streets.	Alongside superstructures within WKCD / After completion of superstructure construction / Prior to operation stage	Design Consultant / Contractor appointed by WKCDA	✓	✓			EIAO-TM
Table 14.10.17 (CM7)	Table 10.8 (CM7)	Structure, ornamental planting shall be provided along amenity strips to enhance the landscape quality.	Alongside superstructures within WKCD / After completion of superstructure construction / Prior to operation stage	Contractor appointed by WKCDA	✓	✓			EIAO-TM
Table 14.10.17 (CM8)	Table 10.8 (CM8)	Landscape design shall be incorporated to architectural and engineering structures in order to provide aesthetically pleasing designs.	Alongside superstructures within WKCD / After completion of superstructure construction / Prior to operation stage	Design Consultant / Contractor appointed by WKCDA	✓	✓			EIAO-TM
Table 14.10.21 (MMC1)	Table 10.9 (MMC1)	Use of decorative screen hoarding/boards	WKCD construction sites / Throughout construction stage / Prior to operation stage	Contractor appointed by WKCDA		✓			ETWB TCW No. 3/2006

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
Table 14.10.21 (MMC2)	Table 10.9 (MMC2)	During the transition period, the temporary ventilation shafts for the basement associated with the underpass road will adopt light colour	WKCD basement construction sites / After completion of ventilation shaft superstructure / Prior to operation stage	Design Architect / Contractor appointed by WKCDA	✓	✓			EIAO-TM
Table 14.10.21 (MMC3)	Table 10.9 (MMC3)	The early introduction of landscape treatments	WKCD construction sites / Towards the end of construction stage / Prior to operation stage	Contractor appointed by WKCDA		✓			EIAO-TM
Table 14.10.21 (MMC4)	Table 10.9 (MMC4)	The temporary landscape areas will help achieve the visual balance and reduce the visual impacts derived by the construction activities within the site	Temporary landscape areas / Throughout construction stage / Prior to operation stage	Contractor appointed by WKCDA		✓			EIAO-TM
Table 14.10.21 (MMC5)	Table 10.9 (MMC5)	Control of night time lighting such as avoidance of lighting from spilling onto nearby residential developments.	WKCD construction sites / During night time / Throughout construction stage	Contractor appointed by WKCDA		✓			EIAO-TM
Landscape and Visual Impact (Operation)									
Table 14.10.18 (OM1)	Table 10.10 (OM1)	Provide proper planting maintenance on the new planting areas to enhance the aesthetic design degree	WKCD open areas / Throughout operation phase / As-needed basis	Contractor appointed by WKCDA			✓		EIAO-TM
Table 14.10.18 (OM2)	Table 10.10 (OM2)	Provision of open space in various forms and at different levels on or above ground, including park, waterfront promenade, piazzas and terrace garden and associated green connections for public enjoyment.	WKCD open areas / Throughout operation phase / As-needed basis	Design Consultant / Contractor appointed by WKCDA	✓		✓		EIAO-TM
Table 14.10.2	Table 10.11	Adoption of light colour for the temporary ventilation shafts associated with the underpass road during operation phase	WKCD buildings / During design stage / Prior to	Design Architect / Contractor	✓		✓		EIAO-TM

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
2 (MMO1)	(MMO1)	(day 1)	operation stage (year 10)	appointed by WKCDA					
Table 14.10.22 (MMO2)	Table 10.11 (MMO2)	The temporary landscape areas will help achieve the visual balance and reduce the visual impacts derived by the construction activities within the WKCD site during operation phase (Day 1)	Temporary landscaped areas / Throughout construction stage / Prior to operation stage (year 10)	Design Architect / Contractor appointed by WKCDA	✓		✓		EIAO-TM
Table 14.10.22 (MMO3)	Table 10.11 (MMO3)	Use of planter and other softscape treatments during operation phase (Day 1)	WKCD construction sites / Throughout construction stage / Prior to operation stage	Design Architect / Contractor appointed by WKCDA			✓		EIAO-TM
Table 14.10.22 (MMO4)	Table 10.11 (MMO4)	Use of decorative screen hoarding/boards. during operation phase (day 1)	WKCD construction sites / Throughout construction stage / Prior to operation stage	Contractor appointed by WKCDA			✓		EIAO-TM
Table 14.10.22 (MMO5)	Table 10.11 (MMO5)	Aesthetic design of roads and roadside planting during operation phase (year 10)	Areas close to the entrance of the underground road	Contractor appointed by WKCDA			✓		EIAO-TM
Table 14.10.22 (MMO6)	Table 10.11 (MMO6)	Control of night time lighting such as avoidance of lighting from spilling onto nearby residential developments during operation phase (day 1 and year 10)	WKCD building exterior and open areas / During night time / Throughout operation stage	Contractor appointed by WKCDA			✓		EIAO-TM

Appendix E. Implementation Schedule for Environmental Mitigation Measures on Austin Road Flyover Serving the Planned WKCD

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
Air Quality Impact (Construction)									
15.3.6.1	11.3.1	**General Dust Control Measures** Frequent water spraying for active construction areas (12 times a day or once every one hour), including Heavy construction activities such as construction of buildings or roads, drilling, ground excavation, cut and fill operations (i.e., earth moving)	Within WKCD site / Duration of the construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIA Recommendation and Air Pollution Control (Construction Dust) Regulation
15.3.6.1	11.3.1	**Best Practice For Dust Control** The relevant best practices for dust control as stipulated in the Air Pollution Control (construction Dust) Regulation should be adopted to further reduce the construction dust impacts from the Project. These best practices include: *Good Site Management* ▪ Good site management is important to help reducing potential air quality impact down to an acceptable level. As a general guide, the Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimise the release of visible dust emission. Any piles of materials accumulated on or around the work areas should be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimising generation of fugitive dust emissions. The material should be handled properly to prevent fugitive dust emission before cleaning. *Disturbed Parts of the Roads* ▪ Each and every main temporary access should be paved with concrete, bituminous hardcore materials or metal plates	Within WKCD site / Duration of the construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIA Recommendation and Air Pollution Control (Construction Dust) Regulation

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
		and kept clear of dusty materials; or ▪ Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet. *Exposed Earth* ▪ Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies. *Loading, Unloading or Transfer of Dusty Materials* ▪ All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet. *Debris Handling* ▪ Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides. ▪ Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped. *Transport of Dusty Materials* ▪ Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards. *Wheel washing* ▪ Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. *Use of vehicles* ▪ The speed of the trucks within the site should be controlled							

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
		to about 10km/hour in order to reduce adverse dust impacts and secure the safe movement around the site. ■ Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. ■ Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle. *Site hoarding* ■ Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit.						
15.3.6.1	11.3.1	**Best Practicable Means for Cement Works (Concrete Batching Plant)** The relevant best practices for dust control as stipulated in the Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93) should be followed and implemented to further reduce the construction dust impacts of the Project. These best practices include: Exhaust from Dust Arrestment Plant ■ Wherever possible the final discharge point from particulate matter arrestment plant, where is not necessary to achieve dispersion from residual pollutants, should be at low level to minimise the effect on the local community in the case of abnormal emissions and to facilitate maintenance and inspection Emission Limits	Within WKCD site / Duration of the construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIA recommendation; Guidance Note on the Best Practicable Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
		▪ All emissions to air, other than steam or water vapour, shall be colourless and free from persistent mist or smoke Engineering Design/Technical Requirements ▪ As a general guidance, the loading, unloading, handling and storage of fuel, raw materials, products, wastes or by-products should be carried out in a manner so as to prevent the release of visible dust and/or other noxious or offensive emissions							
Air Quality Impact (Operation)									
		No mitigation measure is required.							
Noise Impact (Construction)									
15.4.6	11.4.1	**Good Site Practice** Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during each phase of construction: ▪ only well-maintained plant to be operated on-site and plant should be serviced regularly during the construction works; ▪ machines and plant that may be in intermittent use to be shut down between work periods or should be throttled down to a minimum; ▪ plant known to emit noise strongly in one direction, should, where possible, be orientated to direct noise away from the NSRs; ▪ mobile plant should be sited as far away from NSRs as possible; and ▪ material stockpiles and other structures to be effectively utilised, where practicable, to screen noise from on-site construction activities.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIAO and Noise Control Ordinance

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
15.4.6	11.4.1	**Adoption of Quieter PME** The recommended quieter PME adopted in the assessment were taken from EPD's QPME Inventory and "*Sound Power Levels of Other Commonly Used PME*". It should be noted that the silenced PME can be found in Hong Kong.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIAO and Noise Control Ordinance
15.4.6	11.4.1	**Use of Movable Noise Barriers** Movable noise barriers can be very effective in screening noise from particular items of plant when constructing the Project. Noise barriers located along the active works area close to the noise generating component of a PME could produce at least 10 dB(A) screening for stationary plant and 5 dB(A) for mobile plant provided the direct line of sight between the PME and the NSRs is blocked.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIAO and Noise Control Ordinance
15.4.6	11.4.1	**Use of Noise Enclosure/ Acoustic Shed** The use of noise enclosure or acoustic shed is to cover stationary PME such as air compressor and concrete pump. With the adoption of the noise enclosure, the PME could be completely screened, and noise reduction of 15 dB(A) can be achieved according to the EIAO Guidance Note No.9/2010.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIAO and Noise Control Ordinance
15.4.6	11.4.1	**Use of Noise Insulating Fabric** Noise insulating fabric can also be adopted for certain PME (e.g. drill rig, pilling machine etc). The Fabric should be lapped such that there are no openings or gaps on the joints. According to the approved Tsim Sha Tsui Station Northern Subway EIA Report (AEIAR-127/2008), a noise reduction of 10 dB(A) can be achieved for the PME lapped with the noise insulating fabric.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			EIAO and Noise Control Ordinance
Noise Impact (Operation)									
		No mitigation measure is required.							
Water Quality Impact (Construction)									
15.5.5.1	11.5.1	**Construction site runoff and drainage** The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff	Within WKCD site / Duration of the construction phase /	Contractor appointed by WKCDA		✓			ProPECC Note PN 1/94

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
		and the chance of erosion. The following measures are recommended to protect water quality and sensitive uses of the coastal area, and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impacts: ▪ 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, earth bunds or sand bag barriers should be provided on site to direct storm water to silt removal facilities. The design of the temporary on-site drainage system should be undertaken by the WKCDA's Contractor prior to the commencement of construction; ▪ Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the WKCDA's Contractor prior to the commencement of construction. ▪ 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 during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. ▪ Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from	Prior to commencement of operation						

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
		foundation excavations should be discharged into storm drains via silt removal facilities. ▪ 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 facility should be provided at construction site exit where practicable. Wash-water should have sand and silt settled out and removed regularly 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. ▪ Open stockpiles of construction materials or construction wastes on-site 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 be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and stormwater runoff being directed into foul sewers. ▪ Precautions should be taken at any time of the year when rainstorms are likely. Actions should be taken when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC Note 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. ▪ Bentonite slurries used in piling or slurry walling should be reconditioned and reused wherever practicable. Temporary enclosed storage locations should be provided on-site for							

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
		any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.							
15.5.5.1	11.5.1	**Sewage effluent from construction workforce** Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			ProPECC Note PN 1/94
15.5.5.1	11.5.1	**General construction activities** Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby storm water drain. Stockpiles of cement and other construction materials should be kept covered when not being used. Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby storm water drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event.	Within WKCD site / During construction phase / Prior to commencement of operation	Contractor appointed by WKCDA		✓			ProPECC Note PN 1/94
Water Quality Impact (Operation)									
15.5.5.2	11.5.2	**Road and surface runoff** For operation of the proposed WKCD development and associated local road network, a surface water drainage system would be provided to collect road and surface runoff. It is recommended that the road drainage should be provided with adequately designed silt trap and oil interceptors, as necessary. The design of the operation stage mitigation measures for the proposed WKCD development and associated local road	Within WKCD site / During operation phase / Throughout operation phase	To be agreed between DSD and WKCDA prior to commencement of operation			✓		ProPECC Note PN 5/93, *Highways Department Guidance Notes RD/GN/035*

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
		network should take into account the guidelines published in the Practice Note for Professional Persons on Drainage Plans Subject to Comment by the Environmental Protection Department (ProPECC Note PN 5/93) and *Highways Department Guidance Notes RD/GN/035 – Road Pavement Drainage Design*.							
Sewerage and Sewage Treatment Implications (Design)									
		No mitigation measure is required.							
Sewerage and Sewage Treatment Implications (Operation)									
		No mitigation measure is required.							
Waste Management Implications (Construction)									
15.7.4.1	11.7.1	**Good Site Practices** Recommendations for good site practices during the construction activities include: ▪ Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site ▪ Training of site personnel in proper waste management and chemical handling procedures ▪ Provision of sufficient waste disposal points and regular collection of waste ▪ Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by either covering trucks or by transporting wastes in enclosed containers ▪ Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction to public roads ▪ Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting the inert	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by WKCDA		✓			Waste Disposal Ordinance; Waste Disposal (Chemical Wastes) (General) Regulation; and Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
		or non-inert C&D materials is not anticipated							
15.7.4.1	11.7.1	**Waste Reduction Measures** Recommendations to achieve waste reduction include: ▪ Sort inert C&D material to recover any recyclable portions such as metals ▪ Segregation and storage of different types of waste in different containers or skips to enhance reuse or recycling of materials and their proper disposal ▪ Encourage collection of recyclable waste such as waste paper and aluminium cans by providing separate labelled bins to enable such waste to be segregated from other general refuse generated by the work force ▪ Proper site practices to minimise the potential for damage or contamination of inert C&D materials ▪ Plan the use of construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by WKCDA		✓			Waste Disposal Ordinance
15.7.4.1	11.7.1	**Inert and Non-inert C&D Materials** In order to minimise impacts resulting from collection and transportation of inert C&D material for off-site disposal, the excavated materials should be reused on-site as fill material as far as practicable. In addition, inert C&D materials generated from excavation works could be reused as fill materials in local projects that require public fill for reclamation. ▪ The surplus inert C&D materials, if any, will be disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong. ▪ Liaison with the CEDD Public Fill Committee (PFC) on the allocation of space for disposal of the inert C&D materials at PFRF will be initiated. No construction work is allowed to proceed until all issues on management of inert C&D	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by WKCDA		✓			Waste Disposal Ordinance ; Technical Circular (Works) No.6/2010 for Trip Ticket System for Disposal of Construction & Demolition Materials; and Technical Circular (Works) No. 19/2005 Environmental Management on

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
		materials have been resolved and all relevant arrangements have been endorsed by the relevant authorities including PFC and EPD. ▪ The C&D materials generated from general site clearance should be sorted on site to segregate any inert materials for reuse or disposal of at PFRFs whereas the non-inert materials will be disposed of at the designated landfill site. ▪ In order to monitor the disposal of inert and non-inert C&D materials at respectively PFRFs and the designated landfill site, and to control fly-tipping, it is recommended that the Contractor should follow the Technical Circular (Works) No.6/2010 for Trip Ticket System for Disposal of Construction & Demolition Materials issued by Development Bureau. In addition, it is also recommended that the Contractor should prepare and implement a Waste Management Plan detailing their various waste arising and waste management practices in accordance with the relevant requirements of the Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site.							Construction Site
15.7.4.1	11.7.1	**Chemical Waste** If chemical wastes are produced at the construction site, the Contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the "Code of Practice on the Packaging Labelling and Storage of Chemical Wastes". Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor should use a licensed collector to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by WKCDA		✓			Code of Practice on the Packaging Labelling and Storage of Chemical Wastes; Waste Disposal (Chemical Waste) (General) Regulation

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
		recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation. Potential environmental impacts arising from the handling activities (including storage, collection, transportation and disposal of chemical waste) are expected to be minimal with the implementation of appropriate mitigation measures as recommended.							
15.7.4.1	11.7.1	**General Refuse** General refuse should be stored in enclosed bins or compaction units separated from inert C&D material. A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from inert C&D material. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.	WKCD construction site / Throughout construction stage / Until completion of all construction activities	Contractor appointed by WKCDA		✓			Waste Disposal Ordinance and Public Health and Municipal Services Ordinance - Public Cleansing and Prevention of Nuisances Regulation
Waste Management Implications (Operation)									
		No mitigation measure is required.							
Land Contamination (Construction)									
		No mitigation measure is required.							
Land Contamination (Operation)									
		No mitigation measure is required.							
Ecological Impact (Construction)									
		No mitigation measure is required.							
Ecological Impact (Operation)									
		No mitigation measure is required.							
Landscape and Visual Impact (Construction)									
Table	Table	Trees should be retained in situ on site as far as possible.	WKCD construction site /	Contractor	✓	✓			ETWB TCW No.

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
15.10.15 (CM1)	11.8 (CM1)	Should tree removal be unavoidable due to construction impacts, trees will be transplanted or felled with reference to the stated criteria in the Tree Removal Applications to be submitted to relevant government departments for approval in accordance to ETWB TCW No. 29/2004 and 3/2006.	Throughout construction stage / Until completion of all construction activities	appointed by WKCDA					29/2004 and 3/2006
Table 15.10.15 (CM2)	Table 11.8 (CM2)	Compensatory tree planting shall be incorporated to the proposed project and maximize the new tree, shrubs and other vegetation planting to compensate tree felled and vegetation removed. Also, implementation of compensatory planting should be of a ratio not less than 1:1 in terms of quality and quantity within the site.	WKCD Park and public areas / After completion of site formation / Prior to operation stage	Contractor appointed by WKCDA	✓	✓			ETWB TCW No. 3/2006
Table 15.10.15 (CM3)	Table 11.8 (CM3)	Buffer trees for screening purposes to soften the hard architectural and engineering structures and facilities.	Alongside superstructures within WKCD / After completion of superstructure construction / Prior to operation stage	Contractor appointed by WKCDA	✓	✓			EIAO-TM
Table 15.10.15 (CM4)	Table 11.8 (CM4)	Softscape treatments such as vertical green wall panel /planting of climbing and/or weeping plants, etc, to maximize the green coverage and soften the hard architectural and engineering structures and facilities.	Alongside superstructures within WKCD / After completion of superstructure construction / Prior to operation stage	Design Consultant / Contractor appointed by WKCDA	✓	✓			EIAO-TM
Table 15.10.15 (CM7)	Table 11.8 (CM7)	Structure, ornamental planting shall be provided along amenity strips to enhance the landscape quality.	WKCD construction sites / During excavation and site formation / Throughout construction stage	Contractor appointed by WKCDA	✓	✓			EIAO-TM
Table 15.10.15 (CM8)	Table 11.8 (CM8)	Landscape design shall be incorporated to architectural and engineering structures in order to provide aesthetically pleasing designs.	WKCD construction sites / During excavation and site formation / Throughout construction	Design Consultant / Contractor appointed by WKCDA	✓	✓			EIAO-TM

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1]				Relevant Legislation & Guidelines
					Des	Con	Op	Dec	
			stage						
Table 15.10.19 (MMCP 1)	Table 11.9 (MMCP 1)	Use of decorative screen hoarding/boards	WKCD construction sites / Throughout construction stage / Prior to operation stage	Contractor appointed by WKCDA		✓			ETWB TCW No. 3/2006
Table 15.10.19 (MMCP 2)	Table 11.9 (MMCP 2)	Control of night time lighting such as avoidance of lighting from spilling onto nearby developments.	WKCD construction sites / During night time / Throughout construction stage	Contractor appointed by WKCDA		✓			EIAO-TM
Landscape and Visual Impact (Operation)									
Table 15.10.16 (OM1)	Table 11.10 (OM1)	Provide proper planting establishment works, including watering, pruning, weeding, pest control, replacement of dead plant, etc, on the new planting areas to enhance the aesthetic design degree	WKCD open areas / Throughout operation phase / As-needed basis	Landscape Contractor appointed by WKCDA			✓		EIAO-TM
Table 15.10.16 (OM2)	Table 11.10 (OM2)	Provision of open space in various forms and at different levels on or above ground, including park, waterfront promenade, piazzas and terrace garden and associated green connections for public enjoyment.	WKCD open areas / Throughout operation phase / As-needed basis	Detailed Design Consultant / Contractor appointed by WKCDA			✓		EIAO-TM
Table 15.10.20 (MMOP 1)	Table 11.11 (MMOP 1)	Integrated design of the flyover with the existing flyover located to the west of the Elements	Project site of flyover/ During detailed design stage / Throughout operation phase	Detailed Design Consultant appointed by WKCDA	✓		✓		EIAO-TM
Table 15.10.20 (MMOP	Table 11.11 (MMOP 2)	Softscape treatments such as climber shall be incorporated to soften the hard engineering structures.	Alongside superstructures within WKCD / After completion of superstructure	Landscape Contractor appointed by WKCDA			✓		EIAO-TM

EIA Ref.	EM&A Ref.	Environmental Protection Measures	Location / Duration of measures / Timing of completion of measures	Implementation Agent	Implementation Stage[1] Des	Con	Op	Dec	Relevant Legislation & Guidelines
2)			construction / Throughout operation stage						
Table 15.10.20 (MMOP 3)	Table 11.11 (MMOP 3)	Compensatory planting in close proximity of the flyover structure	In close proximity of the project site/ After completion of superstructure construction / Throughout operation stage	Landscape Contractor appointed by WKCDA			✓		EIAO-TM
Table 15.10.20 (MMOP 4)	Table 11.11 (MMOP 4)	Control of night time lighting such as careful considerations for the locations and the angle of the lighting.	WKCD building exterior and open areas / During night time / Throughout operation stage	Contractor appointed by WKCDA			✓		EIAO-TM

[1] Des = Design; Con = Construction; Op = Operation; Dec = Decommission

Appendix F. Sample Template for the Interim Notifications

Sample template for the 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: