

New Wang Tong River Bridge

Environmental Monitoring and Audit Manual

(v.2.0)

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Joint Venture



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1. INTRODUCTION

1.1 Background

- 1.1.1 Silver Mine Bay is a popular bathing beach in Mui Wo that attracted 4,550 visitors on a peak day and over 69,000 visitors utilized the beach in 2012.
- 1.1.2 In order to relieve the overcrowding problem and the road safety concern of Wang Tong Bridge (hereafter called "Old Bridge"), two bridges (pedestrian bridge and cycle bridge) are proposed to replace the Old Bridge. The new pedestrian bridge and the new cycle bridge (hereafter called "New Bridges") are also designed to align with the future amenity development on the northern side of the Old Bridge.
- 1.1.3 The Project mainly comprises the following works:
 - i. Construction of a new cycle bridge next to the existing bridge
 - ii. Demolition of the existing bridge
 - iii. Construction of a new pedestrian bridge on the same site of the existing bridge
- 1.1.4 Based on the current design, both the new pedestrian bridge and cycle bridge will be supported by the abutment and pier that stand above high water mark of Wang Tong River. Location and layout of the New Bridges are shown in **Figure 1.1**.
- 1.1.5 The Project consists of the following designated projects under Part I, Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO):
 - Item C.12 (a)...a dredging operation which is less than 500m from the nearest boundary of an existing...(iii) bathing beach...
- 1.1.6 A project profile (PP-478/2013) has been submitted to Environmental Protection Department on 28 January 2013 and a study brief (ESB- 256/2013) has been issued to HyD in March 2013.
- 1.1.7 As a detailed environmental impact assessment (EIA) is required under the Environmental Impact Assessment Ordinance (EIAO), HyD appointed **the Joint Venture of Maurice Lee and Associates Ltd. and Cinotech Consultants Ltd.** (hereinafter called the JV) to perform the EIA study.

1.2 Project Programme

1.2.1 The construction work for this Project is expected to be commenced in mid 2017 and completed in mid 2019.

1.3 Purpose of this Environmental Monitoring and Audit (EM&A) Manual

- 1.3.1 The purpose of this EM&A Manual (hereafter called the "Manual") is to guide the establishment of an EM&A programme to assure compliance with the standards and predictions in the EIA study involving the construction and operation of the New Bridges. Environmental performance will be regularly monitored and audited for evaluating the effectiveness of the recommended mitigation measures. If necessary, needs for additional mitigation measure(s) and/or remedial action(s) will also be investigated.
- 1.3.2 This EM&A Manual is prepared based on the findings and recommendations in the EIA, and with reference to the requirements stipulated in Annex 21 Technical Memorandum under the Environmental Impact Assessment Ordinance (EIAO-TM):
 - (i) To propose EM&A programme to monitor the environmental performance of the project
 - (ii) To check the implementation status of mitigation measures to minimize construction and operational impacts on the environment
 - (iii) To identify the need for additional mitigation measures
 - (iv) To advise the responsibilities of different parties involved in the project and communication flow among them
 - (v) To detail monitoring requirements (locations, environmental parameters, frequency, duration) before and during the construction period and in the operational period
 - (vi) To propose monitoring equipment required and quality assurance
 - (vii) To determine action and limit levels of each environmental parameter based on the legislative criteria and standards for compliance checking
 - (viii) To set up event and action plans for remedial actions if exceedance of compliance is identified
 - (ix) To devise procedures for handling complaint/consultation
 - (x) To detail reporting requirement

1.4 Structure of EM&A Manual

- 1.4.1 This EM&A Manual comprises the following Chapters:
 - Ch.1 Introduction
 - Ch. 2 Project Organization
 - Ch. 3 Air Quality Impact

- Ch. 4 Noise Impact
- Ch. 5 Water Quality Impact
- Ch. 6 Ecological Impact
- Ch. 7 Waste Management
- Ch. 8 Landscape and Visual Impact
- Ch. 9 Site Environmental Audit
- Ch. 10 Reporting
- Ch. 11 Conclusion

2. PROJECT ORGANIZATION

2.1 Introduction

2.1.1 The implementation of the recommended EM&A programme requires participation of relevant parties in a correlative and collaborative manner. The project organization and lines of communication with respect to the recommended EM&A works are shown in **Figure 2.1**. The roles and responsibilities of the key EM&A programme participants involved are described in the following sections.

2.2 Project Proponent

2.2.1 The Project Proponent (Highways Department) shall employ Independent Environmental Checker (IEC) to audit and check the EM&A works of the Environmental Team (ET).

2.3 The Contractor

- 2.3.1 The Contractor implies all construction contractors and sub-contractors working on the project site. He should:
 - (i) Engage the ET to carry out EM&A work
 - (ii) Notify the ET construction activities that may have environmental concern
 - (iii) Participate in the site inspection carried out by the ET and to rectify any environmental deficiency identified
 - (iv) Propose and implement necessary measures to mitigate any exceedance in Action/Limit Level recorded in accordance to the Event/Action Plans
 - (v) Investigate complaints according to the agreed procedures

2.4 Engineer's Representatives (ER)

- 2.4.1 The ER shall be responsible to oversee the construction work of all contractors to ensure that the contract specification can be met. He should:
 - (i) Supervise the Contractor's activities to ensure that they comply with the requirement in the EIA, EM&A Manual, Environmental Permit (EP) and the contract specifications
 - (ii) Follow the agreed procedures in the Event/Action Plan in case of any exceedance and instruct the Contractor to carry out remedial actions
 - (iii) Investigate complaints according to the agreed procedures and instruct the

Contractor to follow up

(iv) Assist the ET in implementation of EM&A programme when required

2.5 Independent Environmental Checker (IEC)

- 2.5.1 The IEC shall be appointed by Highways Department to audit and verify the EM&A works of the ET and to oversee the environmental performance of the project site. He shall not have any association with the Contractor, ER or ET.
 - (i) Review and verify EM&A Reports and submissions for EP prepared by the ET and advise for improvement
 - (ii) Audit and confirm the validity and accuracy of monitoring activities and results. He may carry out random sample check and audit on monitoring data and sampling procedures, etc
 - (iii) Review the implementation status and effectiveness of mitigation measures onsite and ensure that they are carried out properly
 - (iv) Conduct monthly and random site inspection.
 - (v) Investigate complaints according to the agreed procedures
 - (vi) Review the proposal of mitigation measures by the Contractor in an event of exceedance according to the Event/Action Plan

2.6 Environmental Team (ET)

- 2.6.1 The ET shall be led by the ET Leader to carry out EM&A programme and to check the Contractor's compliance with the environmental protection requirements in the EIA, EM&A Manual and EP. He should:
 - (i) Set up monitoring station to carry out monitoring, statistical analysis and compliance checking against legislative standard and guidelines
 - (ii) Repeat field measurement in case of exceedance and propose mitigation measures for improvement
 - (iii) Conduct weekly site inspection to audit the Contractor's site practice on pollution prevention and the effectiveness and adequacy of mitigation measures
 - (iv) Advise the Contractor rectification work required when environmental deficiency is identified
 - (v) Prepare monthly and quarterly EM&A report to summarise environmental performance and to anticipate future key issues
 - (vi) Review and comment on work schedule and methodology as necessary

- (vii) Support the Contractor for submissions required under the EP
- (viii) Investigate complaints and propose corrective measures according to the agreed procedures
- (ix) Liaise with the IEC on environmental performance
- 2.6.2 The ET Leader shall keep a contemporaneous logbook for recording each and every instance or circumstance or change of circumstances that may affect the compliance with the recommendations of the EIA report. This logbook shall be kept readily available for inspection by the IEC, and Director of Environmental Protection (DEP) or his authorised officers.

3. AIR QUALITY IMPACT

3.1 Introduction

- 3.1.1 Major air quality impact in construction phase would arise from demolition of Old Bridge, excavation and concreting for construction of New Bridges. With implementation of dust suppression measures, it is anticipated that the dust impact would be minimal. Regular air quality monitoring should be conducted at representative ASRs to ensure that relevant air quality standard can be met.
- 3.1.2 In the operational phase, the bridges will serve as walkway and cycle track. No air pollution will be generated from these activities and therefore no operational phase air quality monitoring is required.
- 3.1.3 This section outlines the requirements, methodology, equipment and locations for monitoring air quality impacts during the demolition of the Old Bridge and construction of the New Bridges in the construction phase.

3.2 Monitoring Parameters

3.2.1 The ET shall evaluate the construction air quality impact by conducting 1-hour and 24-hour Total Suspended Particulates (TSP) measurements.

3.3 Monitoring Equipment

- 3.3.1 1-hour and 24-hour TSP levels will be measured in accordance to the standard high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix A.
- 3.3.2 Other than using high volume sampler, 1-hour TSP levels can be measured alternatively by direct reading from portable dust meters upon approval from ER. The meters should be capable of producing comparable results as that by the high volume sampling method, to indicate short event impacts.

3.4 Monitoring Requirements

High Volume Sampler

- 3.4.1 The ET shall provide sufficient number of high volume samplers (HVSs) for measurement at different ASRs during each monitoring. The HVSs shall comply with the following specifications for carrying out the 1-hour and 24-hour TSP monitoring:
 - (a) 0.6 1.7 m³ per minute adjustable flow range;

- (b) equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operation;
- installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours (c) operation;
- capable of providing a minimum exposed area of 406 cm²; (d)
- flow control accuracy: +/- 2.5% deviation over 24-hour sampling period; (e)
- (f) equipped with a shelter to protect the filter and sampler;
- incorporated with an electronic mass flow rate controller or other equivalent (g) devices;
- (h) equipped with a flow recorder for continuous monitoring;
- (i) provided with a peaked roof inlet;
- (j) incorporated with a manometer;
- (k) able to hold and seal the filter paper to the sampler housing at horizontal position;
- (1) equipped with easily changeable filter; and
- (m) capable of operating continuously for a 24-hour period.
- 3.4.2 Clearly labelled calibration kit and filter papers shall also be provided. The HVSs should be equipped with an electronic mass flow controller and be calibrated against a traceable standard at regular intervals.
- 3.4.3 Calibration should be conducted immediately after installing the HVSs, and repeated on bi-monthly basis. The transfer standard shall be traceable to the internationally recognised primary standard and be calibrated annually. The concern parties such as IEC shall properly document the calibration data for future reference. All the data should be converted into standard temperature and pressure condition.
- 3.4.4 The flow-rate of HVSs shall be kept constant throughout the sampling process. Both initial and final flow-rate (with the filter in position) shall be recorded in the data sheet, as shown in **Appendix B**.

Direct Reading Meter

3.4.5 If the ET prefers to adopt direct reading method for 1-hour TSP, he should provide adequate support to the IEC for verifying the capacity of the meter as with the HVSs in obtaining comparable measurements. The meter shall be calibrated at regular intervals in accordance to the specification in the manufacturer's manual. The calibration certificates shall be available to the IEC for checking upon request. The validity and accuracy of the meter shall also be tested against the results by the HVS periodically.

Collection of Wind Data

3.4.6 For recording wind speed and wind direction, the ET shall install wind data monitoring equipment near the dust monitoring locations. The installation location shall be proposed by the ET and agreed with the IEC. The installation and operation of the equipment shall meet the following criteria:

- (a) The wind sensors should be installed 10 m above ground so that they are clear of obstructions or turbulence caused by buildings.
- (b) The wind data should be captured by a data logger. The data shall be downloaded for analysis at least once a month.
- (c) The wind data monitoring equipment should be re-calibrated at least once every six months.
- (d) Wind direction should be divided into 16 sectors of 22.5 degrees each.
- 3.4.7 If agreed by the ER and the IEC, the ET may obtain wind data using alternative method.

 <u>Laboratory Testing</u>
- 3.4.8 Filter paper to be placed in the HVSs should have a size of 8" x 10" and should be clean without any pinhole. Before sampling, it should be labelled, and pre-weighed to 0.1 mg by a calibrated electronic balance after being conditioned in a constant humidity for over 24 hours.
- 3.4.9 After sampling, the filter paper in the HVS will be loaded with dust. The filter paper shall be collected and immediately transferred to a clean, tightly sealed plastic bag for transporting to laboratory. It shall be reconditioned in the constant humidity condition (as before pre-weighing) for over 24 hours before weighing to 0.1 mg by a calibrated electronic balance.
- 3.4.10 All samples should be kept in good condition for 6 months before disposal.
- 3.4.11 The testing laboratory should be HOKLAS accredited. It should be clean and be able to maintain a stable temperature and humidity. Measuring and conditioning instruments should be available for handling the dust samples. It should be able to carry out result analysis, equipment calibration and maintenance.
- 3.4.12 If a site or non-HOKLAS laboratory will be responsible for testing, the laboratory equipment shall be approved by the ER and the procedures shall be witnessed by the IEC. Any measurement performed by the laboratory shall be demonstrated to the satisfaction of the ER and the IEC. The IEC shall regularly audit the performance of the laboratory to ensure the accuracy of testing results. The ET Leader shall provide the ER with one copy of the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix A for his reference.

3.5 Monitoring Location

3.5.1 Two representative Air Quality Monitoring stations (AMSs) are proposed as follows:

Table 3.1 Proposed Dust Monitoring Stations

Monitoring Stations	Location
AMS1	Silvermine Beach Resort
AMS2	1 Tung Wan Tau Road

- 3.5.2 The location of the stations can be found in **Figure 3.1**.
- 3.5.3 The status and locations of dust sensitive receivers may change after this manual is issued. If this happened, the ET Leader shall propose alternative monitoring locations taken into account the following considerations and seek approval from the ER and the IEC:
 - (a) locate at the site boundary or such locations close to the major dust emission source;
 - (b) locate close to the sensitive receivers; and
 - (c) take account the prevailing meteorological conditions.

3.6 Placement of Equipment

- 3.6.1 The ET shall agree with the ER in consultation with the IEC on the position of the HVS for the installation of the monitoring equipment. When positioning the samplers, the following points shall be noted:
 - (a) a horizontal platform with appropriate support to secure the samplers against gusty wind should be provided;
 - (b) no two samplers should be placed less than 2 meters apart;
 - (c) the distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler;
 - (d) a minimum of 2 meters of separation from walls, parapets and penthouses is required for rooftop samplers;
 - (e) a minimum of 2 meters separation from any supporting structure, measured horizontally is required;
 - (f) no furnace or incinerator flue is nearby;
 - (g) airflow around the sampler is unrestricted;
 - (h) the sampler is more than 20 meters from the dripline;
 - (i) wire fence and gate to protect the sampler should not cause any obstruction during monitoring;

- (j) permission must be obtained to set up samplers and to access to monitoring stations; and
- (k) a secured electricity supply is required for samplers to operate.

3.7 Baseline Monitoring

- 3.7.1 Baseline monitoring shall be conducted to determine the existing air quality in terms of 1-hour and 24-hour TSP levels before commencement of construction work. Measurement on 24-hour TSP for 14 consecutive days shall be conducted at all monitoring stations. At least 3 sets of 1-hour TSP data shall also be collected every day during this period, at the predicted time in which greatest impact is expected.
- 3.7.2 During baseline monitoring, there should have no major construction or dust generating activities near the monitoring stations. The ET shall propose a monitoring schedule to the IEC, so that he can conduct onsite audit to ensure the accuracy of the measurement where necessary.
- 3.7.3 Alternative AMS that can give representative baseline data may be proposed for ER and IEC's approval with justifications.
- 3.7.4 In exceptional cases, when insufficient baseline monitoring data or questionable results are obtained, the ET shall liaise with the IEC and ER to agree on an appropriate set of data to be used as a baseline reference and submit to EPD for approval.
- 3.7.5 The baseline monitoring data shall be reviewed once in every three months. When there is seasonal change on ambient conditions, the baseline condition may need to be updated. Repeated measurements shall be conducted when there is no dust generating activity near the AMSs. If a change in ambient condition is recorded, the baseline levels, hence the air quality criteria should be revised accordingly and agreed with the IEC and EPD.

3.8 Impact Monitoring

- 3.8.1 Impact monitoring shall be conducted throughout the construction period at all AMSs. 24-hour TSP shall be sampled at least once in every 6 days, while sampling for 1-hour TSP shall be at least 3 times in every 6 days when the highest dust impact takes place. Similar to baseline monitoring, the ET shall submit a monitoring schedule to the IEC for auditing the accuracy of the monitoring result where necessary.
- 3.8.2 The ET shall clearly define and strictly follow the starting and ending time for 24-hour TSP monitoring for each AMS.
- 3.8.3 If exceedance of air quality criteria is recorded, more frequent measurements shall be done within the specified timeframe in accordance to the Action Plan. The additional monitoring shall be continued until the excessive dust emission or the deterioration in air quality is rectified, and upon agreement with the IEC.

3.9 Air Quality Performance Limit

3.9.1 The Air Quality Objective sets the statutory limit for 1-hour and 24-hour TSP levels, while the baseline monitoring results shall be interpreted to derive the action levels.

Table 3.2 Action and Limit Levels for Air Quality

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

3.10 Event and Action Plan

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

3.11 Mitigation Measures

3.11.1 The EIA proposed a number of mitigation measures to be implemented in construction phase, examples as follows:

Construction Phase

- (a) Hoarding of not less than 2.4 m high shall be erected from ground level to surround the work area except for a site entrance or exit.
- (b) Good housekeeping to minimize dust generation, e.g. by properly handling and storing dusty materials
- (c) Adopt dust control measures, such as dust suppression using water spray on exposed soil, in areas with dusty construction activities and during material handling
- (d) Minimize exposed earth after completion of work in a certain area by hydroseeding, vegetating, soil compacting or paving
- (e) Cover materials on trolleys before leaving the site
- (f) Stockpiling should be avoided. However, if found necessary, the materials should be covered by impervious materials such as tarpaulin

3.11.2 Detailed mitigation measures are listed out in the EMIS in **Appendix A**. Implementation status and the effectiveness of these measures shall be audited through regular site inspection.

4. NOISE IMPACT

4.1 Introduction

- 4.1.1 In the construction phase, the major noise impact will be arisen from the use of powered mechanical equipment. With the proposed mitigation measures, construction noise impact on the representative noise sensitive receiver is predicted to comply with the noise criteria. Regular monitoring of noise level should be carried out at noise monitoring stations near representative sensitive receiver before and throughout construction work to ensure that relevant noise standard can be met.
- 4.1.2 The New Bridges will serve as walkway and cycle bridge as the Old Bridge. No operational phase noise monitoring is required.
- 4.1.3 In this section, the equipment, requirements, monitoring locations, criteria and protocols for the monitoring and audit of noise impacts during the construction of the proposed New Bridges under the Project are presented.

4.2 Monitoring Parameters

- 4.2.1 Construction noise level shall be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). L_{eq 30min} shall be used as the monitoring parameter for the time period between 0700 and 1900 hours on normal weekdays. For all other time periods, L_{eq 5min} shall be employed for comparison with the Noise Control Ordinance (NCO) criteria.
- 4.2.2 As supplementary information for data auditing, statistical results such as L₁₀ and L₉₀ shall also be obtained for reference.

4.3 Monitoring Equipment

- 4.3.1 Sound level meters shall be employed to measure the construction noise level. It should comply with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications in accordance to the Technical Memorandum (TM) issued under the NCO.
- 4.3.2 An acoustic calibrator shall be used to validate the accuracy of the sound level meter before and after each noise measurement. The calibrator can generate a known sound pressure level at a known frequency. The noise record will only be accepted if the calibration level from before and after the noise measurement agrees to within 1.0 dB.
- 4.3.3 Sufficient number of the above equipment shall be provided by the ET, who will also be responsible for installation, operation, maintenance and dismantlement. All equipment and instrumentation shall be clearly labelled.

4.4 Monitoring Requirement

- 4.4.1 Noise measurement shall normally be at a point 1 m from the exterior of the sensitive receiver building façade and be at a position 1.2 m above the ground. If the normal monitoring position cannot be accessed, an alternative position may be chosen, and a correction to the measurements shall be made. For reference, a correction of +3 dB(A) shall be made to the free field measurements. The ET shall agree with the IEC on the monitoring position and the corrections adopted. The agreed position shall be chosen in subsequent baseline and impact monitoring.
- 4.4.2 Noise measurements should be made in accordance with standard acoustical principles and practices in relation to weather conditions.

4.5 Monitoring Location

4.5.1 One representative Noise Monitoring Station (NMS) is proposed near the work site as follows:

Table 4.1 Proposed Construction Noise Monitoring Location

Monitoring Stations	Location
NMS1	1 Tung Wan Tau Road

- 4.5.2 The location of the station can be found in **Figure 3.1**.
- 4.5.3 The status and location of noise sensitive receiver may change after this manual is issued. If this happened, the ET Leader shall propose alternative monitoring location taken into account the following considerations and seek approval from the ER and the IEC:
 - (a) locate close to the major site activities which are likely to have noise impacts;
 - (b) locate close to the most affected existing NSR; and
 - (c) take account the possibility of minimizing disturbance to occupants at the NSR during monitoring.

4.6 Baseline Monitoring

- 4.6.1 Baseline measurement shall be conducted to determine the background noise level before commencement of work. Daily measurement of A-weighted levels L_{eq} , L_{10} and L_{90} shall be conducted for at least two weeks. The sample period shall be 30 minutes between 0700 and 1900.
- 4.6.2 During the baseline monitoring, there should have no major construction or noise generating activities near the monitoring stations. The ET shall propose a monitoring schedule to the IEC so that he can conduct onsite audit to ensure the accuracy of the

- measurement where necessary.
- 4.6.3 Alternative NMS that can give representative baseline data may be proposed for ER and IEC's approval with justifications.
- 4.6.4 In exceptional cases, when insufficient baseline monitoring data or questionable results are obtained, the ET shall liaise with the IEC and ER to agree on an appropriate set of data to be used as a baseline reference and submit to EPD for approval.

4.7 Impact Monitoring

- 4.7.1 For daytime construction work on normal weekdays (0700-1900 Monday to Saturday), one set of 30-min measurement shall be carried out at each NMS every week. Measurement procedures shall be referred to the Noise Control Ordinance-TM. Similar to baseline monitoring, the ET shall submit a monitoring schedule to the IEC beforehand.
- 4.7.2 If noise exceedance is recorded, additional noise monitoring shall be conducted in accordance to the Event Action Plan. Additional monitoring shall only be considered as not necessary if the exceedance is being rectified or proved to be from source other than the project construction work.
- 4.7.3 Sample data sheet can be found in **Appendix B**.

4.8 Noise Performance Limit

4.8.1 The EIAO-TM sets the statutory limit for noise level produced during construction work.

Table 4.2 Action and Limit Levels for Noise

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

4.9 Event and Action Plan

4.9.1 Should non-compliance of the noise criteria occur, actions in accordance with the Action Plan in **Appendix C** shall be carried out.

4.10 Mitigation Measures

- 4.10.1 The EIA proposed a number of mitigation measures to be implemented in construction phase, examples as follows:
 - (a) Adopt good site practice, such as regular maintenance of plant equipment, throttle down unused machines
 - (b) Use Quality Powered Mechanical Equipment (QPME)

- (c) Erect 3m high mobile barriers with skid footing and a small cantilevered upper portion within a few meters of stationary plants and within about 5m of more mobile plant such as hydraulic breaker. The minimum surface density of the movable noise barrier is 7 kg/m², and with special design (e.g. with noise absorbing material) where necessary.
- (d) Orient noisy plant equipment away from NSR
- (e) Should there be concurrent project in the vicinity, continuous discussion between contractors shall be conducted to plan the location and programme of construction work to minimize cumulative impact
- 4.10.2 Detailed mitigation measures are listed out in the EMIS in **Appendix A**. Implementation status and the effectiveness of these measures shall be audited through regular site inspection.

5. WATER QUALITY IMPACT

5.1 Introduction

- 5.1.1 Potential water quality impacts arising from the construction activities are expected due to falling of debris to Wang Tong River, leakage of debris from cofferdam to Wang Tong River, surface runoff, and sewage generated from workforce. These would be minimized by implementing appropriate mitigation measures and good site management practices.
- 5.1.2 Monitoring is proposed in construction phase to keep track of the water quality, in order to identify any unacceptable impact on sensitive receivers. Site audit shall be conducted regularly to ensure that mitigation measures recommended in the EIA Report and this EM&A Manual are implemented properly.
- 5.1.3 No water quality impact is expected from the use of New Bridges as walkway and cycle track in the operational phase. Therefore, no water quality monitoring is required.

5.2 Construction Phase EM&A

Monitoring Requirement

5.2.1 Regular monitoring of water quality should be carried out at water quality monitoring stations (WMSs) downstream to the construction point (impact station) and upstream to the construction site (control stations) before and throughout the construction period.

Monitoring Parameters

- 5.2.2 Suspended solids (SS) and in-situ water quality data (temperature, pH, turbidity, water depth, salinity, dissolved oxygen and percentage of saturation) shall be analysed/measured.
- 5.2.3 Other relevant data, including monitoring location/position, time, tidal stages, weather conditions and any special observation or works in the vicinity that may affect the monitoring results, should also be recorded.
- 5.2.4 To ensure the robustness of in-situ measurement, parameters shall be measured in duplicate. In case the difference between duplicates is larger than 25%, a third set of measurement shall be carried out.
- 5.2.5 A sample data sheet can be found in **Appendix B**.

Monitoring Location

5.2.6 8 water monitoring stations (WMS) are proposed along Wang Tong River and in Silvermine Bay. As the direction of water flow is influenced by stream water discharge and tidal action, each monitoring station will serve as either impact or control station under different tidal periods. Impact stations are located downstream to the construction site to measure any elevation of pollutant levels (e.g. SS level) due to proposed work. Control stations are located upstream of construction site to establish baseline level. The location of the stations can be found in **Figure 5.1**.

Table 5.1 Marine Water Monitoring Locations in Construction Phase

Station	Description		Monitoring Station	Easting	Northing
W1	Wang Tong River	Mid-Flood	Impact	817747	814519
VV 1	(Major tributary)	Mid-Ebb	Control	61//4/	014319
W2	Wang Tong River	Mid-Flood	Impact	817775	814471
W Z	(Major tributary)	Mid-Ebb	Control	617773	0144/1
	Wang Tong River	Mid-Flood	Impact		
W3	(Minor tributary to Tai Wai Yuen)	Mid-Ebb	Control	817803 814537	
	Wang Tong River	Mid-Flood	Impact		
W4	(Minor tributary to Tai Wai Yuen)	Mid-Ebb	Control	817825	814481
	Silvermine Bay	Mid-Flood	Control		
W5	(Near Silvermine Bay Beach)	Mid-Ebb	Impact	817909	814452
	Silvermine Bay	Mid-Flood	Control		
W6	(Near Silvermine Bay Beach)	Mid-Ebb	Impact	818024	814447
W7	Silvermine Bay	Mid-Flood	Control	818061	814277
	(Open Water)	Mid-Ebb	Impact	010001	0144//
W8	Silvermine Bay	Mid-Flood	Control	818224	814444
** 0	(Open Water)	Mid-Ebb	Impact	010224	01 7777

5.2.7 Water samples shall be extracted at 1m below surface, 1m above seabed and at the mid-depth level at where the water depth is at least 6m. However, if the water depth is less than 3m, water samples shall only be collected at the mid-depth level. For stations with depth less than 6m, the mid-depth sample can be omitted.

5.2.8 As the water depth in Wang Tong River can be shallow, sampling work shall be conducted with caution to avoid disturbing the bottom sediment during movement and water extraction.

Monitoring Frequency

- 5.2.9 Baseline Monitoring shall be carried out 3 days per week, at mid-flood and mid-ebb tides (within ± 1.75 hour of the predicted time), for a period of 4 weeks prior to the commencement of construction works. The interval between two sets of monitoring shall not be less than 36 hours. The monitoring period should avoid concurrent marine project in the vicinity.
- 5.2.10 Impact monitoring shall also be conducted at the same frequency throughout the whole construction period. In case exceedance of Action/Limit Level is recorded, the frequency shall be increased as per the Event and Action Plan.

Construction Phase Site Inspection

- 5.2.11 Weekly site audit is recommended to monitor the implementation of the proposed water quality mitigation measures and to check the Contractor's work practice on preventing water pollution during construction phase.
- 5.2.12 Should water pollution is observed (e.g. discharge of silty water into storm drains), the ET should record the environmental deficiency for investigation. The Contractor should be notified and responsible for carrying out rectification work immediately. The ET shall re-inspect the site and review the effectiveness of the remedial measure performed until satisfaction. The Contractor shall implement preventive measure(s) to avoid the same problem.

5.3 Monitoring Equipment

Position System

5.3.1 A calibrated hand held Global Positioning System (GPS) device shall be used during water quality monitoring. The GPS device shall be calibrated at checkpoint (e.g. Quarry Bay Survey Nail at Easting 840683.49 and Northing 816709.55) before taking samples and in-situ measurements. This would ensure that monitoring works are conducted in proposed locations.

Water Depth Detector

5.3.2 A portable, battery-operated echo sounder shall be used for the determination of water depth at each designated monitoring station.

Salinity

5.3.3 A portable salinometer which capable of recording salinity within the range of 0-40 % shall be used for salinity measurements.

Dissolved Oxygen (DO) and Temperature Measuring Equipment

- 5.3.4 The instrument for measuring dissolved oxygen and temperature shall be portable and weatherproof complete with cable, sensor, comprehensive operation manuals and using DC power source. It shall be capable of measuring:
 - A dissolved oxygen level in the range of 0-20 mg/L and 0-200% saturation; and
 - A temperature of 0-45 degree Celsius.
- 5.3.5 It shall have a membrane electrode with automatic temperature compensation complete with a cable.
- 5.3.6 Sufficient stocks of spare electrodes and cables shall be available for replacement where necessary.
- 5.3.7 Salinity compensation shall be built-in in the DO measuring equipment.

Turbidity Measurement Equipment

5.3.8 Nephelometric method shall be used in measuring turbidity in-situ. The instrument shall be portable, weatherproof complete with a cable, sensor, comprehensive operation manuals and DC power source. It shall have a photoelectric sensor capable of measuring turbidity between 0-1000 NTU and complete with a cable with at least 25 m in length. The meter shall be calibrated in order to establish the relationship between NTU units and suspended solids level. Turbidity shall be measured on split water sample collected from the same depths of suspended solid samples.

pН

5.3.9 The instrument shall consist of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It shall be readable to 0.1 pH in a range of pH 0 to 14. Standard buffer solutions of at least pH 7 and pH 10 shall be used for calibrating the instrument before and after use.

Sampler

5.3.10 A water sampler, consisting of a transparent PVC or glass cylinder of a capacity of not less than two litres which can be effectively sealed with cups at both ends shall be used. The water sampler shall 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.

Sample Container and Storage

5.3.11 After sampling, samples shall be transferred and stored in high density polythene bottles with no preservatives added, stored in 4°C without being frozen, and delivered to the laboratory for analysis as soon as possible. Each sample should have sufficient volume for robust analysis.

Calibration of In-situ Instruments

- 5.3.12 All in-situ monitoring instruments shall be checked, calibrated and certified by a laboratory accredited under HOKLAS or other international accreditation scheme before use, and be subsequently re-calibrated at 3 monthly intervals throughout all stages of the water quality monitoring programme. Responses of sensors and electrodes shall be checked with certified standard solutions before each use. Wet bulb calibration for a DO meter shall be carried out before measurement at each monitoring event.
- 5.3.13 For the on-site calibration of field equipment (Multi-parameter Water Quality System), the BS 1427:2009, "Guide to on-site test methods for the analysis of waters" shall be observed.
- 5.3.14 Sufficient stocks of spare parts shall be maintained for replacements when necessary. Backup monitoring equipment shall also be made available so that monitoring can proceed uninterrupted even if some equipment is under maintenance, calibration, etc.

<u>Laboratory Analysis</u>

5.3.15 The testing of suspended solids shall be conducted by a HOKLAS accredited laboratory with comprehensive quality assurance and control procedures in place in order to ensure the quality and the consistency of results. Analytical method and detection limit shall follow APHA 17e 2540 D or equivalent, subject to agreement with EPD.

Table 5.2 Analytical method and detection limit for water samples

Determinant	Detection Limit	Method Reference
Suspended Solids	0.5 mg/L	APHA 17e 2540 D

5.4 Water Quality Performance Limit

5.4.1 The following table listed out the criteria for relevant water quality parameters during construction phase monitoring work.

Table 5.3 Action and Limit Levels

Parameters	Action Level	Limit Level
DO in mg/ L (Surface, Middle & Bottom)	Surface & Middle: 5 percentile of baseline data for surface and middle layers Bottom: 5 percentile of baseline data for bottom layer.	Surface & Middle: 4 mg/L or 1 percentile of baseline data for surface and middle layers. Bottom: 2 mg/L or 1 percentile of baseline data for bottom layer.

Parameters	Action Level	Limit Level
	95 percentile of baseline data	99 percentile of baseline data
SS in mg/ L	or 120% of upstream control	or 130% of upstream control
(depth-averaged)	station's SS at the same tide	station's SS at the same tide of
	of the same day.	the same day.
	95 percentile of baseline data	99 percentile of baseline or
Turbidity in NTU	or 120% of upstream control	130% of upstream control
(depth-averaged)	station's turbidity at the same	station's turbidity at the same
	tide of the same day.	tide of the same day.

5.5 Event and Action Plan

5.5.1 Should non-compliance of the water quality criteria occur, actions in accordance with the Action Plan in **Appendix** C shall be carried out.

5.6 Mitigation Measures

- 5.6.1 Examples of construction phase mitigation measures are shown as follows:
 - (a) Schedule works in water in dry season as far as possible (e.g. demolition of old pier, construction of abutment)
 - (b) Construct abutment of the bridge within cofferdam
 - (c) Demolish existing pier within waterproof casing
 - (d) Construct temporary platform above water to prevent falling of debris during demolition and construction of bridges
 - (e) Well manage construction materials, stockpiles and chemicals for proper storage and usage and to prevent accumulation onsite. Keep them away from the river and sea.
 - (f) Immediately clean up contaminated soil upon chemical and oil leakage
 - (g) Store fuels, chemicals and waste at designated area with locks and bunds
 - (h) Register as chemical waste producer
 - (i) Settle surface runoff in sedimentation tank prior to discharge
 - (j) Cover slope and loose materials with tarpaulin before rainstorm and inspect the area afterwards
 - (k) Cover manhole to prevent silty runoff from entering the foul sewer
- 5.6.2 Detailed mitigation measures are listed out in the EMIS in **Appendix A**. Implementation status and the effectiveness of these measures shall be audited through regular site inspection.

6. WASTE MANAGEMENT

6.1 Introduction

- 6.1.1 This project is expected to generate inert and non-inert construction and demolition (C&D) waste from demolition of Old Bridge, excavation/dredging for pile cap and unused construction materials; marine sediment extracted from minipile; chemical waste from plant maintenance; and general refuse from workers. No adverse waste impact is expected if the mitigation measures are implemented properly. No operational waste is expected.
- 6.1.2 Land use in the vicinity of the Site includes residential, commercial (hotel) and bathing beach. Active agriculture in the past has now subsided. No industrial activity that may cause land contamination was identified. Previous land use as pig farm at the now Silvermine Beach Resort is evaluated to cause low contamination potential at the work site. No unacceptable land contamination impact is expected and no EM&A is proposed.

6.2 EM&A Requirement

- 6.2.1 The Contractor should apply relevant licences/permits for waste disposal under the following regulations and ordinances:
 - (a) Chemical Waste Permits/licenses under the Waste Disposal Ordinance (Cap 354);
 - (b) Public Dumping Licence under the Land (Miscellaneous Provisions) Ordinance (Cap 28);
 - (c) Effluent Discharge Licence under the Water Pollution Control Ordinance.
- 6.2.2 Reference should be made to EPD's booklets on licences/permits. The Contractor shall also document recycling receipts/ disposal record to keep track of waste movement. The ET shall check with the Contractor that these licences/permits have been obtained. He should also review the above documentations regularly to ensure compliance with legislations and specifications.

6.3 Waste Management Plan

6.3.1 The contractor should formulate waste management measures on waste minimization, storage, handling and disposal in a Waste Management Plan as part of Environmental Management Plan in accordance to ETWB TC (W) No.19/2005 for construction phase. Mitigation measures proposed in the EIA Report and the EM&A Manual should be adopted.

6.4 Site Audit

6.4.1 Regular site audit shall be conducted by the ET to check the implementation status and evaluate the effectiveness of the proposed mitigation measures.

6.5 Mitigation Measures

- 6.5.1 The EIA proposed a number of construction phase mitigation measures, examples as follows:
 - (a) Reuse C&D waste onsite and dispose excess uncontaminated ones to public fill
 - (b) Provide sufficient waste collection points for general refuse and regularly maintained to avoid accumulation. Dispose the waste at waste transfer or disposal facilities
 - (c) Provide training to workers on site cleanliness, waste management (waste reduction, reuse and recycle) and chemical handling procedures
 - (d) Excavated marine sediment should be treated by cement solidification and backfilled on land or disposed as public fill as the last resort. Alternatively, the solidified sediment shall be delivered to public fill reception facilities for beneficial reuse as the last resort. No marine dumping will be required.
- 6.5.2 Detailed mitigation measures are listed out in the EMIS in **Appendix A**. Implementation status and the effectiveness of these measures shall be audited through regular site inspection.

7. ECOLOGICAL IMPACT

7.1 Introduction

7.1.1 The proposed Project will cause minor permanent habitat loss of sandy shore above high water mark. Indirect water quality impact which may arise from falling of debris from demolition and construction work, surface runoff or chemical leakage would be minor in construction phase. Use of powered plant equipment may bring minor noise disturbance on wildlife. No ecological impact is expected in the operational phase.

7.2 Mitigation Measures

- 7.2.1 Construction noise and water quality mitigation measures proposed in the previous sections will be applicable to terrestrial and freshwater ecology. In addition, the following mitigation measures shall be carried out:
 - (a) To minimize direct impact on the breeding activity of Black-collared Starling, before site clearance, the work area should be inspected by ecologist to confirm no active bird nest is present. If any active bird nest is identified, suitable size of buffer area should be established until the nest is abandoned.
 - (b) Erection of hoarding, fencing or provision of clear demarcation of work zones to remind workers not to damage area outside the work boundary
- 7.2.2 With proper implementation of mitigation measures, un-acceptable residual impact is not expected. Detailed mitigation measures are listed out in the EMIS in **Appendix A**. Implementation status shall be audited through regular site inspection.

8. LANDSCAPE AND VISUAL IMPACTS

8.1 Introduction

8.1.1 The proposed development will generate some unavoidable residual landscape and visual impacts which are identified and addressed in the LVIA with the aim of avoiding (where practicable) and at the very least, minimising such impacts to within acceptable levels. The main impacts will be the loss of existing trees and the introduction of a new, larger bridge structure to the locality. There are opportunities, during the project's design, construction and operation stages, for incorporating mitigation measures which will contribute to reducing landscape and visual impacts. These include reducing the footprint of the construction phase impacts, existing tree protection and designing and implementing a new bridge which is visually integrated into the existing environment.

8.2 Monitoring of Mitigation Measures during the Construction Phase

- 8.2.1 The Contractor shall employ a professionally qualified Registered Landscape Architect (RLA) to supervise and monitor the implementation of the landscape and visual mitigation measures during the construction and maintenance/establishment periods. This is necessary to ensure that all the recommended landscape and visual mitigation measures under Chapter 8 of the EIA are effectively implemented.
- 8.2.2 Prior to the commencement of construction works, a baseline monitoring report shall be prepared to check, record and re-confirm the status of the Landscape Resources and Landscape Character Areas within the works area. The report shall review the proposed mitigation measures and assess their feasibility with reference to the operational requirements of the detailed project works. Any potential conflicts between proposed mitigation measures and the proposed works shall be resolved at an early stage (prior to construction) and any necessary changes to the mitigation measures shall be incorporated into the detailed design.
- 8.2.3 During the construction phase, the implementation of the mitigation measures shall be monitored including minimisation of the works footprint, erection of appropriate screen hoardings, ensuring that those existing trees earmarked for retention on site or transplanting are protected, that compensatory planting works are correctly implemented and that appropriate building materials and finishes are incorporated. Site inspections by the appointed RLA shall be undertaken at monthly intervals to closely monitor all these aspects of the work. Inspection findings shall be logged in a site monitoring report with any discrepancies or concerns regarding the implementation and effectiveness of mitigation measures highlighted.

8.3 Monitoring of Mitigation Measures during the Operation Phase

- 8.3.1 The compensatory tree planting required to off-set the loss of existing trees should be checked during the 12-month Establishment Period by a professionally qualified Registered Landscape Architect (RLA) engaged by Contractor. The RLA should check the planting on a bi-monthly basis to ensure that it has become established and self-sustainable in order to provide long term landscape and visual mitigation as intended. The trees shall be managed and maintained by HyD until such time the trees are successfully handed over to Leisure and Cultural Services Department (LCSD) for future maintenance, subject to agreement with LCSD in the detailed design stage.
- 8.3.2 Hardworks elements including finishes and paint colours should also be monitored and checked that they are being maintained and are achieving their mitigation function. These should be checked on a quarterly basis by the Contractor during the defects liability period and yearly thereafter by the future maintenance agent (Highways Department). No monitoring and audit under the EM&A programme is required.

8.4 Mitigation Measures

8.4.1 Detailed landscape and visual mitigation measures are listed out in the EMIS in **Appendix A**. The implementation status and the effectiveness of these measures shall be audited through regular site inspection at the frequencies stated above.

9. SITE ENVIRONMENTAL AUDIT

9.1 Introduction

9.1.1 While a number of mitigation measures are proposed in the EIA report, regular site inspection is recommended for direct observation of the implementation progress to ensure that measures are properly implemented. Through a well-established action and reporting system, additional pollution control measures to identified environmental deficiency can be proposed and carried out at early stage. Site inspection is a useful way to enforce the environmental protection requirements onsite during construction.

9.2 Site Inspection

- 9.2.1 The ET Leader will be responsible for the site environmental audit. He will design the environmental site inspection, deficiency and action reporting system and conduct regular site inspection. He should prepare a proposal on the site inspection and reporting methodology to the Contractor for agreement and to the ER for approval.
- 9.2.2 Weekly site inspection shall be performed by the ET within the site where environmental protection measures will be implemented and also offsite where the construction activities may directly or indirectly be impacted upon. The following shall be noted during the inspection:
 - (a) environmental protection and pollution control mitigation measures proposed in the EIA, contract specification, EP and this Manual
 - (b) works progress and programme
 - (c) ongoing results of the EM&A programme
 - (d) individual works methodology proposals (including associated pollution control measures)
 - (e) relevant environmental protection and pollution control laws
 - (f) previous site inspection results
- 9.2.3 The Contractor shall inform the ET on any update of all relevant information on the construction contract necessary for him to carry out the site inspection. After each site inspection, the ET shall submit an inspection report to the Contractor and the ER within 24 hours. It should include inspection result on any identification of environmental deficiency and corresponding mitigation recommendations for taking immediate rectification action. Follow up of identified problem from the previous inspection shall also be included. The Contractor shall report on any rectification actions after the site inspection in accordance to the procedures and timeframe proposed by the ET in the environmental site inspection, deficiency and action reporting system.
- 9.2.4 If significant environmental issue is identified, additional site inspection shall be

performed. This may also be required upon receipt or during investigation of environmental complaint in accordance to the Action Plan for environmental monitoring and audit.

9.3 Compliance with Legal and Contractual Requirements

- 9.3.1 The environmental protection and pollution control laws in Hong Kong and project contract stipulate environmental protection and pollution control requirement for construction activities.
- 9.3.2 As such, the Contractor should submit all work method statements for ER's approval and ET Leader's review on environmental compliance with the contractual requirements. Sufficient environmental protection and pollution control measures shall be demonstrated in the method statement.
- 9.3.3 The ET Leader should also check that the work progress and programme can comply with legal requirement on environmental terms and to prevent violation in the future.
- 9.3.4 The Contractor shall regularly copy relevant documents to the ET for checking, including but not limited to updated Work Progress Reports, updated Works Programme, application letters for different licence/permits under the environmental protection laws, and all valid licences/permits. The site diary shall also be available for inspection upon ET Leader's request.
- 9.3.5 Should any non-compliance with the contractual and legislative requirements is identified after reviewing the documents, the ET should notify the ER and Contractor so that follow-up actions can be taken. He should also inform the ER and Contractor if the current status on licence/permit application and any environmental protection and pollution control preparation works may not meet the works programme or the construction work may lead to potential violation of environmental protection and pollution control requirements in due course.
- 9.3.6 The Contractor shall carry out remedial actions immediately upon receipt of ET's advice. The ER shall check with the Contractor to ensure that appropriate actions has been taken accordingly and can satisfy the environmental protection and pollution control requirement.

9.4 Environmental Complaints

- 9.4.1 Upon receipt of complaint, the ET shall be notified and investigation work shall be undertaken. He shall follow the procedures as listed below:
 - (a) log complaint and date of receipt on to the complaint database
 - (b) investigate the complaint to determine its validity, and to identify if the problem is caused by work activities
 - (c) if the complaint is proved valid and due to works, formulate corresponding mitigation measures with the IEC

- (d) advise the Contractor on any rectification work required
- (e) evaluate the mitigation implementation progress and the updated situation
- (f) if the complaint is transferred from the EPD, submit an interim report on the complaint investigation and remediation progress to the EPD within the time frame assigned by the EPD
- (g) conduct additional monitoring and audit to verify the situation if necessary, and to determine any valid reason that the complaint will not recur
- (h) respond to the complainant by reporting the investigation result and follow-up actions taken (within the time frame set by the EPD if the complaint is made by the EPD)
- (i) record the complaint, investigation, the subsequent actions and results in the monthly EM&A reports
- 9.4.2 The Contractor and ER should provide necessary information and assistance to the ET for completing the investigation work. The Contractor shall implement any identified mitigation measures immediately and the ER shall ensure that the work has been carried out accordingly.

10. REPORTING

10.1 Introduction

10.1.1 The ET shall prepare baseline monitoring report, monthly EM&A reports, quarterly EM&A report and final EM&A report. They shall be submitted to the EPD in paper and electronic formats in timely order.

10.2 Baseline Monitoring Report

- 10.2.1 Baseline monitoring of air quality, noise and water quality are proposed. The baseline monitoring report shall be submitted within 10 workings days after completion of the monitoring work. The recipients include the IEC, Contractor and ER. It should first be verified by the IEC before formal submission to the EPD. The ET shall liaise with the relevant parties on the number of copies required. The report format and monitoring data format shall be agreed with the EPD prior to submission. The baseline monitoring report generally includes but not limited to the following:
 - (a) up to half a page executive summary;
 - (b) brief project background information;
 - (c) drawings showing locations of the baseline monitoring stations;
 - (d) monitoring results (in both hard and soft copies) together with the following information:
 - a. monitoring methodology;
 - b. equipment used and calibration details;
 - c. parameters monitored;
 - d. monitoring locations (and depth);
 - e. monitoring date, time, frequency and duration;
 - f. quality assurance (QA) / quality control (QC) results and detection limits;
 - (e) details of influencing factors, including:
 - a. major activities, if any, being carried out on the site during the period;
 - b. weather conditions during the period; and
 - c. other factors which might affect results;
 - (f) determination of the Action and Limit Levels for each monitoring parameter and statistical analysis of the baseline data;
 - (g) revisions for inclusion in the EM&A Manual; and
 - (h) comments, recommendations and conclusions.

10.3 EM&A Report

- 10.3.1 The ET Leader shall prepare monthly EM&A reports which summarize the result and findings in all EM&A work conducted in accordance to the Manual, such as monitoring and site inspection. It shall be submitted within 10 workings days of the end of each reporting month, with the first report due in the month after construction commences. The recipients include the IEC, Contractor, ER and the EPD. It should first be verified by the IEC before formal submission. The ET shall liaise with the relevant parties on the exact number of copies required and the report format for both paper and electronic format prior to submission of the first EM&A report.
- 10.3.2 As there may be changes in surrounding environment and nature of work in progress, the ET Leader shall review and update the number and location of monitoring stations and parameters to be monitored every 6 months or on as needed basis.

10.4 First EM&A Report

- 10.4.1 The first EM&A report generally includes but not limited to the following:
 - (a) Executive summary (1-2 pages):
 - a. breaches of Action and Limit levels;
 - b. complaint log;
 - c. notifications of any summons and successful prosecutions;
 - d. reporting changes; and
 - e. future key issues.
 - (b) Basic project information:
 - a. project organisation including key personnel contact names and telephone numbers;
 - b. construction programme;
 - c. management structure, and
 - d. works undertaken during the month
 - (c) Environmental status:
 - a. works undertaken during the month with illustrations (such as location of works); and
 - b. 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)
 - (d) A brief summary of EM&A requirements including:
 - a. all monitoring parameters;
 - b. environmental quality performance limits (Action and Limit levels);
 - c. Event and Action Plans:

- d. environmental mitigation measures, as recommended in the project EIA Report; and
- e. environmental requirements in contract documents;
- (e) Implementation status:
 - a. advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the project EIA Report;
- (f) Monitoring results (in both hard and diskette copies) together with the following information:
 - a. monitoring methodology;
 - b. equipment used and calibration details;
 - c. parameters monitored;
 - d. monitoring locations;
 - e. monitoring date, time, frequency, and duration;
 - f. weather conditions during the period;
 - g. major activities being carried out on site during the period;
 - h. any other factors which might affect the monitoring results; and
 - i. QA/QC results and detection limits;
- (g) Report on non-compliance, complaints, and notifications of summons and successful prosecutions:
 - a. record of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
 - b. record of all complaints received (written or verbal) for each media, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
 - c. record of all notification of summons and successful prosecutions for breaches of current environmental protection / pollution control legislation, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary;
 - d. review of the reasons for and the implications of non-compliance, complaints, summons and prosecutions including review of pollution sources and working procedures; and
 - e. description of the actions taken in the event of non-compliance and deficiency reporting and any follow-up procedures related to earlier non-compliance;

(h) Others

- a. an account of the future key issues as reviewed from the works programme and work method statements;
- b. advice on the solid and liquid waste management status; and

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

10.5 Subsequent EM&A Reports

- 10.5.1 Subsequent EM&A report generally includes but not limited to the following:
 - (a) Executive summary (1 2 pages):
 - a. breaches of Action and Limit levels;
 - b. complaints log;
 - c. notifications of any summons and successful prosecutions;
 - d. reporting changes; and
 - e. future key issues.
 - (b) Basic project Information:
 - a. project organization including key personnel contact names and telephone numbers;
 - b. programme;
 - c. management structure; and
 - d. works undertaken during the month.
 - (c) Environmental status:
 - a. works undertaken during the month with illustrations (such as location of works etc.); and
 - b. drawing showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations.
 - (d) Implementation status:
 - a. advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the project EIA;
 - (e) Monitoring results (in both hard and diskette copies) together with the following information:
 - a. monitoring methodology;
 - b. equipment used and calibration details;
 - c. parameters monitored;
 - d. monitoring locations;
 - e. monitoring date, time, frequency, and duration;
 - f. weather conditions during the period;
 - g. major activities being carried out on site during the period;
 - h. any other factors which might affect the monitoring results; and
 - i. QA / QC results and detection limits.

- (f) Report on non-compliance, complaints, and notifications of summons and successful prosecutions:
 - a. record of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
 - b. record of all complaints received (written or verbal) for each media, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
 - c. record of all notification of summons and successful prosecutions for breaches of current environmental protection / pollution control legislation, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary;
 - d. review of the reasons for and the implications of non-compliance, complaints, summons and prosecutions including review of pollution sources and working procedures; and
 - e. description of the actions taken in the event of non-compliance and deficiency reporting and any follow-up procedures related to earlier non-compliance.

(g) Others

- a. an account of the future key issues as reviewed from the works programme and work method statements:
- b. advice on the solid and liquid waste management status; and
- c. comments (for examples, effectiveness and efficiency of the mitigation measures), recommendations (for example, any improvement in the EM&A programme) and conclusions.

(h) Appendix

- a. Action and Limit levels;
- b. graphical plots of trends of monitored parameters at key stations over the past four reporting periods for representative monitoring stations annotated against the following:
 - i. major activities being carried out on site during the period;
 - ii. weather conditions during the period; and
 - iii. any other factors that might affect the monitoring results.
- c. monitoring schedule for the present and next reporting period;
- d. cumulative statistics on complaints, notifications of summons and successful prosecutions; and
- e. outstanding issues and deficiencies.

10.6 Quarterly EM&A Summary Reports

- 10.6.1 The quarterly EM&A summary report shall consist of around 5 pages (3 pages of text and tables and 2 pages of figures). It generally includes but not limited to the following:
 - (a) up to half a page executive summary;

- (b) basic project information:
 - a. a synopsis of the project organisation, programme;
 - b. contacts of key management;
 - c. proponents' contacts and any hotline telephone number for the public to make enquiries; and
 - d. a synopsis of works undertaken during the quarter.
- (c) a brief summary of EM&A requirements:
 - a. monitoring parameters;
 - b. environmental quality performance limits (Action and Limit Levels); and
 - c. environmental mitigation measures, as recommended in the EIA Report;
- (d) environmental status:
 - a. a synopsis of work undertaken during the quarter;
 - b. drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations;
- (e) implementation status:
 - a. advice on the implementation status of environmental protection and pollution control/mitigation measures, as recommended in the EIA report, summarised in the updated implementation schedule;
- (f) graphical plots of the trends of monitored parameters over the past 4 months (the last month of the previous quarter and the present quarter) for representative monitoring stations annotated against;
 - a. the major activities being carried out on site during the period;
 - b. weather conditions during the period; and
 - c. any other factors which might affect the monitoring results;
- (g) advice on the solid and liquid waste management status;
- (h) summary of non-compliance
 - a. a summary of non-compliance (exceedances) of the environmental quality performance limits (Action and Limit Levels);
 - b. a brief review of the reasons for and the implications of non-compliance including review of pollution sources and working procedures;
 - c. a summary description of the actions taken in the event of non-compliance and any follow-up procedures related to earlier non-compliance;
 - d. a summary record of all complaints received (written or verbal) for each media, liaison and consultation undertaken, actions and follow-up procedures taken;
- (i) comments (e.g. effectiveness and efficiency of the mitigation measures), recommendations (e.g. any improvement in the EM&A programme) and conclusions for the quarter; and

10.7 Final EM&A Report

- 10.7.1 A Final EM&A report shall be prepared summarizing the results and findings of the EM&A works throughout the construction period. It should be submitted within 14 working days after project completion. It generally includes but not limited to the following:
 - (a) An executive summary;
 - (b) Drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations;
 - (c) Basic project information:
 - a. a synopsis of the project organisation;
 - b. contacts of key management; and
 - c. a synopsis of work undertaken during the entire construction period.
 - (d) A brief summary of EM&A requirements:
 - a. monitoring parameters;
 - b. environmental quality performance limits (Action and Limit levels); and
 - c. environmental mitigation measures, as recommended in the project EIA Report;
 - d. Event and Action Plans.
 - (e) A summary of the implementation status of environmental protection and pollution control/mitigation measures, as recommended in the project EIA Report, summarised in the updated implementation schedule;
 - (f) Graphical plots of the trends of monitored parameters over the construction period for representative monitoring stations, including the post-project monitoring annotated against:
 - a. the major activities being carried out on site during the period;
 - b. weather conditions during the period; and
 - c. any other factors which might affect the monitoring results.
 - (g) Summary of non-compliance:
 - a. a summary of non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
 - b. a brief review of the reasons for and the implications of non-compliance including review of pollution sources and working procedures as appropriate;
 - c. a summary description of the actions taken in the event of non-compliance;
 - d. a summary record 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;
 - (h) A review of the validity of EIA predictions through comparison with the monitoring data and identification of shortcomings in EIA recommendations;

- (i) A review of the effectiveness and cost-effectiveness of the monitoring methodology
- (j) A review of the effectiveness and efficiency of the mitigation measures and of the performance of the overall EM&A programme;
- (k) Recommendations for improvement;
- (l) Evaluation on the return of environmental condition the baseline or predicted conditions in the EIA Report; and
- (m)Conclusion on the environmental acceptability of the project.

10.8 Data Keeping

10.8.1 The ET shall keep the site documents (such as monitoring field records, site inspection forms etc.) in order and make available for inspection upon request. These documents do not form part of the EM&A report. The monitoring data should also be input into electronic format for checking upon request. All documents and data shall be kept for at least one year after completion of the construction contract.

10.9 Interim Notification of Environmental Quality Limit Exceedances

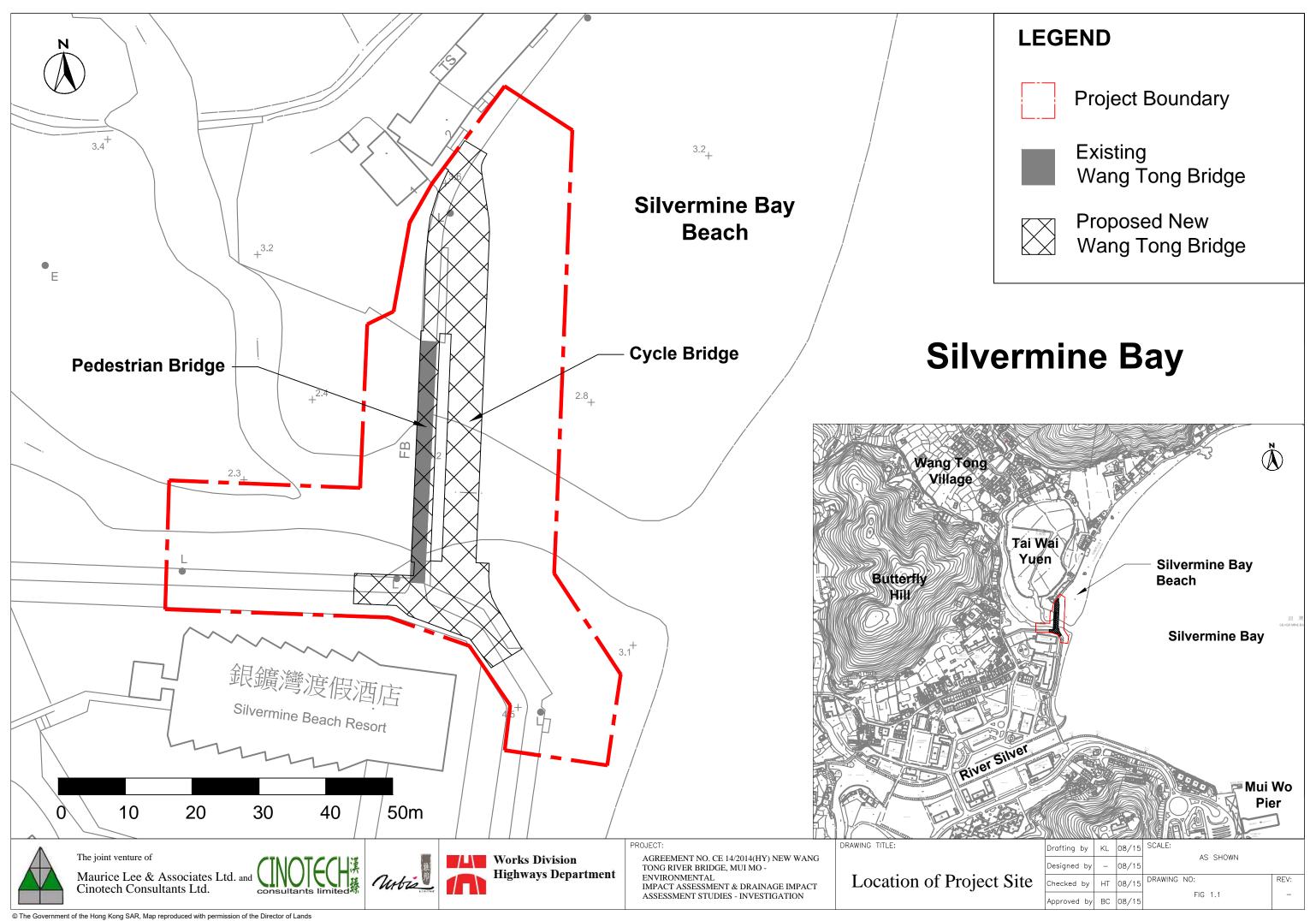
10.9.1 Should any exceedance in environmental quality performance limit be recorded, the ET Leader should immediately inform the IEC, ER, Contractor and EPD as appropriate in accordance to the Event and Action Plan. He should advise to the IEC, ER, Contractor and EPD the investigation result, remediation actions performed, effectiveness of the measures and proposal of further actions required. A sample interim notification template can be found in **Appendix D**.

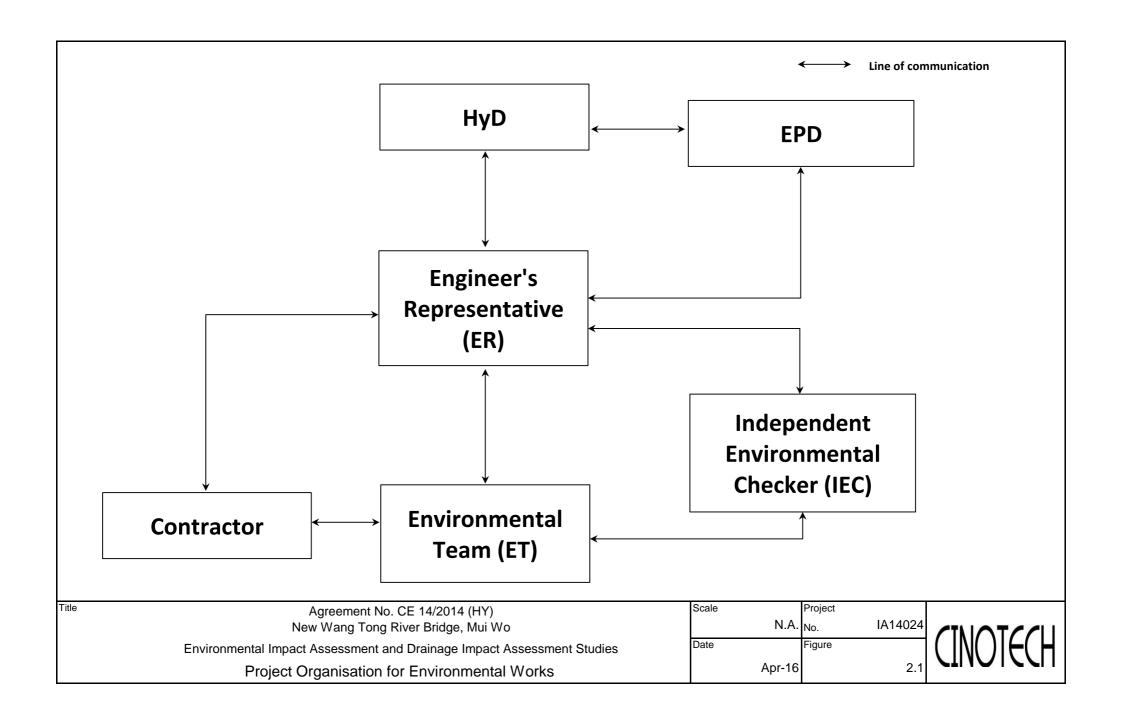
11. CONCLUSION

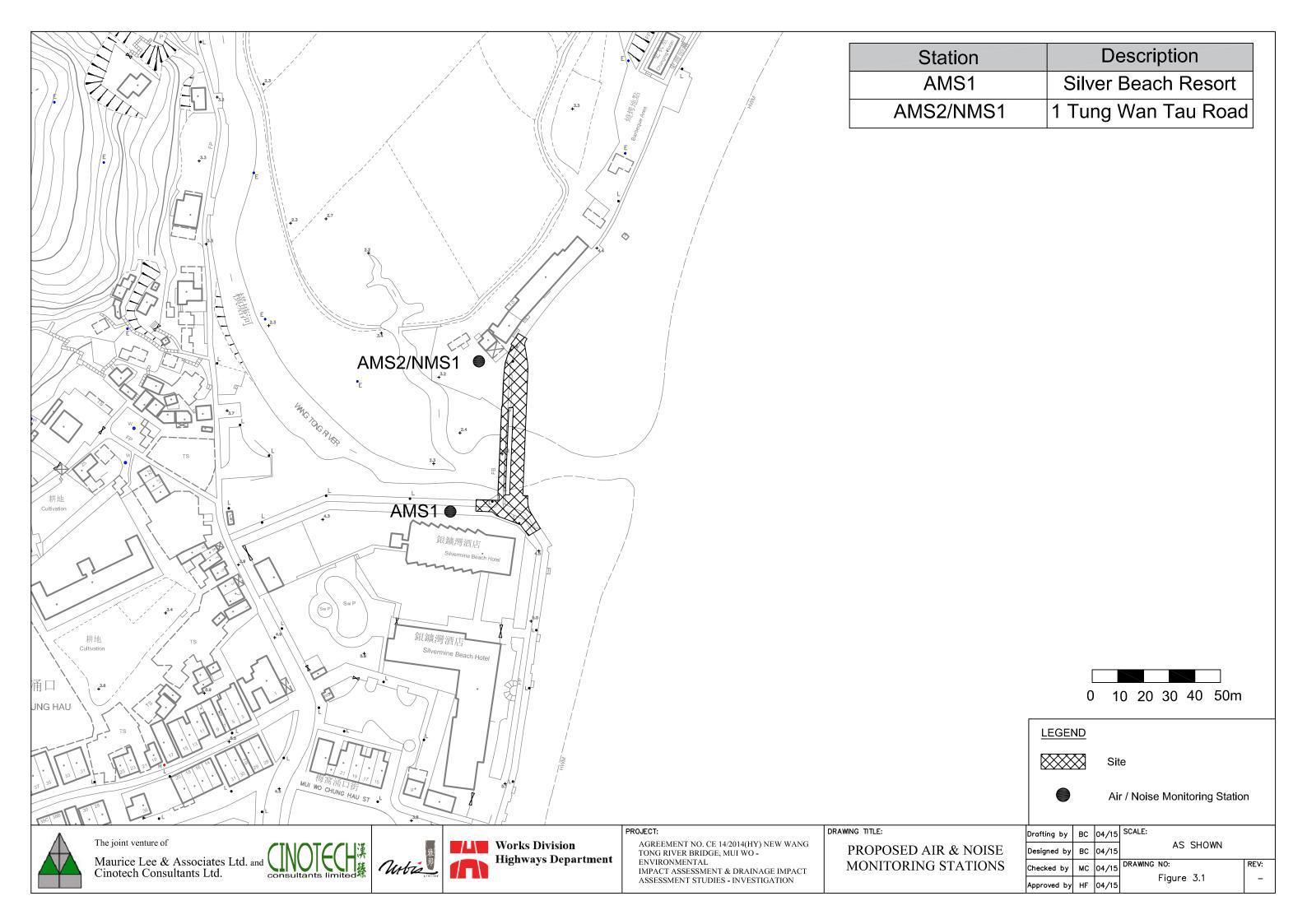
11.1 Introduction

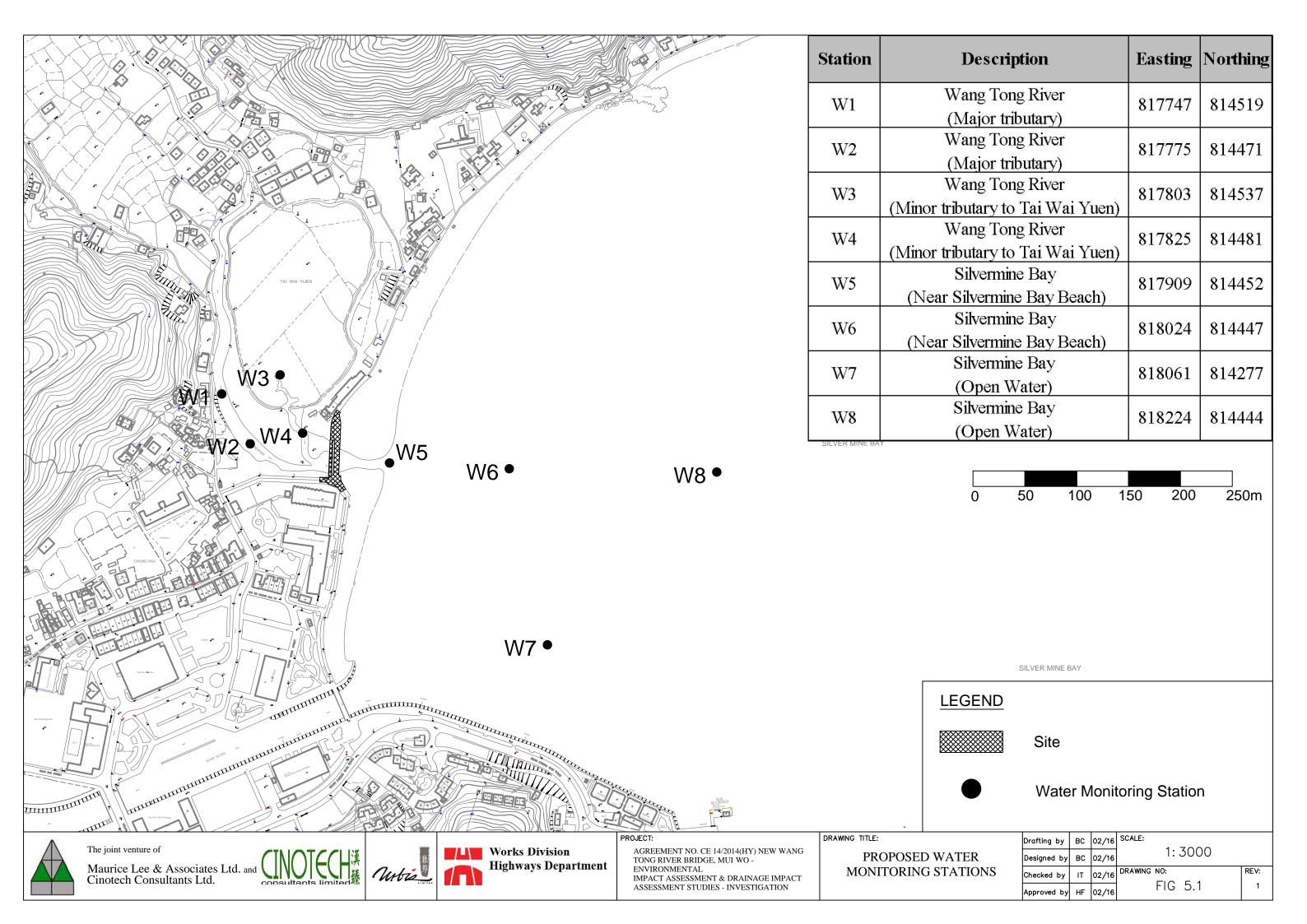
- 11.1.1 This Manual lists out the EM&A requirements for environmental parameters air quality, noise, water quality, ecology, waste management and landscape and visual.
- 11.1.2 Environmental monitoring on air quality, noise and water quality are proposed and regular site inspection is recommended for all other parameters. Any non-compliance identified should be notified to all parties according to the Event and Action Plan and remediation measures should be carried out. Complaints received should be investigated and problems related to construction works should be solved till satisfaction. Baseline, monthly, quarterly and final EM&A reports shall be prepared to report on the continual monitoring results and evaluate the EM&A works).











Appendix A Environmental Mitigation Implementation Schedule (EMIS)

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
	lity Impact tion Phase					
A1	Good housekeeping to minimize dust generation, e.g. by properly handling and storing dusty materials	To minimize dust generation	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A2	Adopt dust control measures, such as dust suppression using water spray on exposed soil, in areas with dusty construction activities, and during material handling	To minimize dust generation due to erosion	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A3	Dust suppression shall be applied to the working area immediately before, during and immediately after site clearance, excavation or earth moving operation to keep the surface wet.	To minimize dust generation due to erosion	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A4	Use water spray to wet the remaining dusty materials on the floor after removing stockpile. The surface of roads or streets shall be free from dust	To minimize dust generation due to erosion	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A5	Storage of dusty materials and debris shall be either entirely covered by impervious sheeting or stored in a three-side and top enclosed area. Alternatively, it should be sprayed with water or a dust suppression chemical to maintain the entire surface wet	To minimize dust generation due to erosion	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A6	All demolished items (e.g. trees, vegetation, structures, debris and rubbish) that may dislodge dust particles shall be covered entirely by impervious sheeting or placed in a three-side and top enclosed area within a day of demolition.	To minimize dust generation	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A7	Store cement bags in shelter with 3 sides and the top covered by impervious materials if the stack exceeds 20 bags	To prevent leakage of cement	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A8	Cement bag shall be debagged, batched and mixed in a three- side and top enclosed area	To minimize dust generation	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A9	Maintain a reasonable height when dropping excavated materials to limit dust generation	To minimize dust generation during movement of excavated materials	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A10	Minimize exposed earth after completion of work in a certain area by hydroseeding, vegetating, soil compacting or paving	To minimize dust generation due to erosion	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
A11	Cover materials on trolleys and trucks before leaving the site to prevent debris from dropping during traffic movement or being blown away by wind	To prevent falling of debris during traffic movement and by wind	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A12	Water or a dust suppression chemical shall be continuously sprayed on the surface where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation is carried out, unless the process is accompanied by the operation of an effective dust extraction and filtering device	To minimize dust emission	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A13	Regular maintenance of plant equipment to prevent black smoke emission	To minimize black smoke emission	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A14	Throttle down or switch off unused machines or machine in intermittent use	To minimize unncessary emission	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A15	Minimize excavation area as far as possible	To minimize dust emission and potential release of odour from exposed ground	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A16	Cover open stockpiles of construction materials (e.g. aggregates, sand and fill materials) with impermeable materials such as tarpaulin during rainstorms.	To prevent soil erosion under rainstorm	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A17	Hoarding of not less than 2.4 m high shall be erected from ground level to surround the work area except for a site entrance or exit	To minimize dust emission	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO
A18	Carry out air quality monitoring throughout the construction period	To monitor construction dust level	HyD's Contractor	At representative ASRs	Prior to and throughout construction phase	EIAO-TM
A19	Carry out regular site inspection to audit the implementation of mitigation measures	To check the implemenation status and effectiveness of mitigation measures	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
Noise In	tion Phase					
N1	Schedule noisy activities to minimise exposure of nearby NSRs to high levels of construction noise	To minimize construction noise level	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N2	Use hand-held plant equipment or manual equipment as far as possible	To minimize construction noise level	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N3	Use Quality Powered Mechanical Equipment (QPME) which produces lower noise level	To minimize construction noise level	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N4	In the direction of noise sensitive receivers, erect mobile barriers with 3m in height from a few metres of stationary plants, and from about 5m of more mobile plant such as hydraulic breaker to prevent direct view. The barrier should have skid footing and a small cantilevered upper portion. The minimum surface density of the movable noise barrier is 7 kg/m² and provide with noise absorbing material.	To lower noise transmission	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N5	Position mobile noisy equipment in location and direction away from NSR	To minimize noise transmission to NSR	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N6	Use silencer or muffler on plant equipment and should be properly maintained	To minimize noise transmission	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N7	Operate noisy plant equipment such as air compressor, generator and concrete pump within enclosure	To minimize noise transmission	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N8	Cover the noisy part of piling machine with acoustic mat	To minimize noise transmission	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N9	Throttle down or switch off unused machines or machine in intermittent use between work	To mimize noise production	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N10	Avoid carrying out noisy activities at the same time	To mimize noise production	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
N11	Reduce the percentage on-time for some noisy PMEs	To mimize noise production	HyD's Contractor	Whole construction site	Throughout construction phase	NCO, EIAO-TM
N12	Carry out noise monitoring throughout the construction period	To monitor construction noise level	HyD's Contractor	At representative NSRs	Prior to and throughout construction phase	EIAO-TM

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
	tion Phase					
W1	Works in the river (excavation within highwater mark and cutting of pier of Old Bridge) shall be carried out inside the watertight cofferdam. The cofferdam can only be removed after completion of work.	To prevent the excavated materials or cuttings from falling into the water and being carried into the sea	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM
W2	Install sheet piles by vibratory action.	To minimize dispersion of sand	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W3	Erect water-tight temporary working platform that can contain falling debris above Wang Tong River. The platform shall be sheltered by tarpaulin for directing rainwater away from the working platform.	To prevent falling of debris and generation of surface runoff into the river	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W4	Water removed from the cofferdam should be desilted before discharge.	To prevent discharge of silty water	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM
W5	Set up sedimentation tank for settling suspended solids in wastewater before discharge into storm drains. Sand/silt removal facilities such as sand traps, silt traps and sedimentation basin should be provided with adequate capacity.	To reduce the amount of suspended solid in wastewater	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W6	Maintain silt removal facilities, channels, manholes before and after rainstorm.	To prevent failure that may lead to flooding	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W7	Remove silt and grit from silt trap at regular interval.	To prevent blockage that may lead to flooding	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W8	Design works program carefully to minimize work areas, hence minimize soil exposure and site runoff.	To minimize surface runoff and chance of erosion	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W9	Arrange excavation works outside rainy seasons (April to September) as far as possible. If this cannot be achieved, the following measures should be implemented: - Cover temporary exposed slope surfaces with impermeable materials, e.g. tarpaulin - Protect temporary access roads by crushed stone or gravel	To minimize surface runoff and chance of erosion	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
	- Carry out adequate surface protection measures well before the arrival of a rainstorm					

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
W10	Minimize exposed earth after completion of work in a certain area by hydroseeding, vegetating, soil compacting or paving	To prevent soil erosion under rainstorm	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W11	Cover open stockpiles of construction materials (e.g. aggregates, sand and fill materials) with impermeable materials such as tarpaulin during rainstorms.	To prevent soil erosion under rainstorm	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W12	Cover and temporary seal manholes to prevent silt, construction materials or debris and surface runoff from entering foul sewers.	To prevent overloading of foul sewers	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W13	Placing equipment, materials and wastes away from Wang Tong River and Silver Mine Bay	To prevent water contamination	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM
W14	Remove waste from the site regularly.	To prevent waste accumulation	HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
W15	Apply discharge license for effluent discharge. Treat the discharge to comply with the requirement in TM-DSS.	To ensure compliance with effluent discharge requirement	HyD's Contractor	Whole construction site	Throughout construction phase	WPCO, TM-DSS, EIAO-TM
W16	Reuse treated effluent onsite, e.g. dust suppression and general cleaning.	To minimize wastewater generation	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO- TM
W17	Monitor effluent water quality.	To ensure compliance with effluent discharge requirement	HyD's Contractor	Whole construction site	Throughout construction phase	WPCO, EIAO-TM
W18	Register as chemical waste producer if chemical waste will be generated.	To control chemical waste	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal (Chemical Waste) (General) Regulation, EIAO-TM
W19	Perform maintenance of vehicles and equipment that have oil leakage and spillage potential on hard standings within a bunded area with sumps and oil interceptors.	To prevent oil leakage or spillage	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal (Chemical Waste) (General) Regulation, EIAO-TM
W20	Dispose chemical waste in accordance to Waste Disposal Ordinance. Follow the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes, examples as follows: - Store chemical wastes at designated safe location with adequate space	To avoid accident in waste storage and handling	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM
W21	Placing chemical toilet away from waterbodies as far as possible and on stable, impermeable surface	To minimize accidental leakage of sewage into waterbodies	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
W22	Carry out water quality monitoring at water sensitive receivers	To identify any water quality impact due to the project	HyD's Contractor	Whole construction site	Before, throughout and after construction phase	EIAO-TM
W23	Carry out regular site inspection to audit the implementation of mitigation measures	To check the implemenation status and effectiveness of mitigation measures	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM, APCO

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve			
Ecologic	Ecological Impact								
Construc	tion Phase								
E1	Before site clearance, the work area should be inspected by ecologist to confirm no active bird nest is present. If any active bird nest is identified, suitable size of buffer area should be established until the nest is abandoned.	To minimize direct impact on the breeding activity of Black- collared Starling	HyD's Contractor	Whole construction site	Before site clearance	EIAO-TM			
E2	Erection of hoarding, fencing or provision of clear demarcation of work zones	To minimize direct impact outside work boundary	HyD's Contractor	Whole construction site	Throughout construction phase	EIAO-TM			

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve			
	Vaste Management Construction Phase								
Construc	tion Phase		I	I	T	T			
WM1	Allocate an area for waste sorting and storage of C&D materials into the following categories for reuse, recycle or disposal if possible. Remove waste from the Site for sorting once generated if no suitable space can be identified.	To minimize waste generation	HyD's	Whole	Throughout construction	Waste Disposal Ordinance, EIAO-			
VV IVI I	- excavated material suitable for reuse		Contractor	construction site	phase	TM			
	- inert C&D materials for reuse/disposal offsite				phase				
	- non-inert C&D materials for disposal at landfills								
	- chemical waste								
	- general refuse Adopt good site practice as follows:				-				
	- Provide training to workers on site cleanliness, waste management (waste reduction, reuse and recycle) and chemical handling procedures	To proper handling of waste	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM			
WM2	- Provide sufficient waste collection points and regular removal								
	- Cover waste materials with tarpaulin or in enclosure during transportation								
	 Maintain drainage systems, sumps and oil interceptors Sort out chemical waste for proper handling and treatment onsite or offsite 								
	Adopt waste reduction measures as follows:								
WM3	- Allocate area/containers for sorting, recovering and storing waste for reuse, recycle or disposal (e.g. demolition debris and excavated materials, general refuse like aluminium cans). Remove waste from the Site for sorting once generated if no suitable space can be identified.	To minimize waste generation	HyD's Contractor	Whole Throughout construction site phase	Waste Disposal Ordinance, EIAO-TM				
	- Allocate area for proper storage of construction materials to prevent contamination								

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
WM4	Prepare and implement a site specific Waste Management Plan (WMP) as part of Environmental Management Plan (EMP) in accordance with ETWB TCW No. 19/25. Detail waste management method in the form of avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal according to the recommendations on the EIA and EM&A Manual. It should be approved by the ER and regularly reviewed.	To provide guidance to waste management	HyD's Contractor	Whole construction site	Throughout construction phase	ETWB TCW No. 19/2005, EIAO-TM
	Store waste materials properly as follows:					
	- Avoid contamination by proper handling and storing waste		HyD's Contractor	Whole construction site	Throughout construction phase	ProPECC PN 1/94, EIAO-TM
WM5	Prevent erosion by covering wasteMaintain and clean storage area regularly	To properly store waste				
	- Sort and stockpile different materials at designated location to			Site	phase	
	enhance reuse					
WM6	Apply for relevant waste disposal permits in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28).	To properly dispose waste	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28), Dumping at Sea Ordinance (Cap. 466), EIAO-TM
WM7	Implement trip-ticket system for recording the amount of waste generated, recycled and disposed, including chemical wastes	To monitor movement of waste	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal (Chemical Waste) (General) Regulation, Waste Disposal Ordinance, EIAO-TM
WM8	Reduce water content in wet spoil generated from piling work by mixing with dry materials. Only dispose treated spoil with less than 25% dry density to Public Fill Reception Facilities	To minimize load to reception facilities	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM
WM9	Dispose dry waste or waste with less than 70% water content by weight to landfill	To minimize load to reception facilities	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
WM10	Follow the Code of Practice on the Packaging, Labelling and Storage of Chemical Waste as follows: - Store chemical wastes with suitable containers. Seal and maintain the container to avoid leakage or spillage during storage, handling and transport - Label chemical waste containers in both English and Chinese with instructions in accordance to Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation - The container capacity should be smaller than 450 litres unless agreed by the EPD	To avoid accident in waste storage and handling	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM
W11	Comply with the requirement of the chemical storage area: - Store only chemical waste and label clearly the chemical characters of the waste - Have at least 3 sides enclosed and protected from rainfall with cover - Provide sufficient ventilation - Have impermeable floor and has bunds to contain 110% of the capacity of the largest container or 20% of the total volume of the stored waste in the area, whichever is larger - Adequately spaced incompatible materials	To ensure proper storage of chemical waste	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO- TM
W12	Transfer used lubricants, waste oils and other chemicals to oil recycling companies, if possible, and empty oil drums for reuse or refill. No direct or indirect discharge is permitted	To ensure proper disposal of chemical waste	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal (Chemical Waste) (General) Regulation, EIAO-TM
W13	Hire licensed chemical waste disposal contractors for waste collection and removal. Dispose chemical waste at the approved CWTC at Tsing Yi or other licensed facility	To ensure proper disposal of chemical waste	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal (Chemical Waste) (General) Regulation, EIAO-TM
W14	Provide recycling bins for sorting out recyclables for collection by recycling companies. Non-recyclables should be removed to designated landfills every day by licensed collectors to prevent environmental and health nuisance.	To ensure proper recycling and disposal of general refuse	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM
W15	Terminate excavation work if contaminated soil is found. Prepare Land Contamination Plan (CAP) in accordance with EPD's Guidance Note for Contaminated Land Assessment and Remediation for identifying soil and groundwater sampling locations, followed by testing and remediation where necessary.	To identify presence of contaminated soil and provide proper remediation	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
W16	Marine sediment shall be cement solidified and and sent to laboratory for Toxicity Characteristics Leaching Procedure (TCLP) test according to USEPA Method 1311 and 6020. The results are considered satisfactory if Universal Treatment Standards (UTS) are being met as per Table 4.6 of Practice Guide of Investigation and Remediation of Contaminated Land. The Unconfined Compressive Strength (UCS) of the solidified sediment shall also reach 1000kPa according to the above Practice Guide. If the TCLP and UCS testing results cannot meet the criteria, the sediment shall be retreated by cement solidification. After passing the tests, the solidified sediment shall be backfilled on land after the piling work (e.g. for construction of new piers and abutments). Alternatively, the solidified sediment shall be delivered to public fill reception facilities for beneficial reuse as the last resort.	To prevent leakage of contaminants to water.	HyD's Contractor	Whole construction site	Throughout construction phase	Waste Disposal Ordinance, EIAO-TM, Practice Guide of Investigation and Remediation of Contaminated Land

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
Landsca	pe and Visual					
Construct	ion Phase					
CM1	The construction area and contractor's temporary works areas should be minimised to avoid impacts on adjacent landscape. (Measure for mitigating Landscape and Visual impacts)	To minimise landscape footprint and reduce potential for visual impact	HyD's Contractor	Adjacent to existing bridge	Construction Phase	To approved Detailed Design and RLA's Approval
CM2	Reduction of construction period to practical minimum. (Measure for mitigating Visual impact)	To reduce duration of impacts	HyD's Contractor	N/A	Construction Phase	To approved Detailed Design and RLA's Approval
СМЗ	Construction traffic (land and sea) including construction plant, construction vessels and barges should be kept to a practical minimum. (Measure for mitigating Visual impact)	To minimise temporary visual impacts	HyD's Contractor	Connecting roads to site and Silver Mine Bay	Construction Phase	To approved Detailed Design and RLA's Approval
CM4	Erection of decorative mesh screens or construction hoardings around works areas in visually unobtrusive colours. (Measure for mitigating Visual impact)	To screen works sites and plant	HyD's Contractor	Around works areas	Construction Phase	To approved Detailed Design and RLA's Approval
CM5	Avoidance of excessive height and bulk of site buildings and structures. (Measure for mitigating Visual impact)	To reduce temporary visual impacts	HyD's Contractor	Within works sites	Construction Phase	To approved Detailed Design and RLA's Approval
CM6	Control of night-time lighting by hooding all lights and through minimisation of night working periods. (Measure for mitigating Visual impact)	To reduce temporary visual impacts	HyD's Contractor	Within works sites	Construction Phase	To approved Detailed Design and RLA's Approval

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to Implement the measure	Location of the measure	When to implement the measure	What requirements or standard for the measure to achieve
CM7	All existing trees shall be carefully protected before, during construction and after construction. A Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees or trees to be transplanted, including trees in contractor's works areas for approval by the Registered Landscape Architect (RLA). This method statement for tree protection and transplanting shall make reference to "Guidelines on Tree Preservation during Construction" and "Guidelines on Tree Transplanting" published by GLTM of the DEVB. Early preparation of trees to be transplanted shall be undertaken to increase their likely survival rate following transplanting. (Measure for mitigating Landscape impact)	To minimise tree impacts and maximise tree preservation	HyD's Contractor	Within and adjacent to works sites	Construction Phase	To approved Detailed Design and RLA's Approval
CM8	Minimisation of Impacts to Wang Tong River through minimised and carefully controlled dredging for pile/abutment removal/construction works. (Measure for mitigating Landscape impact)	To minimise contamination of Wang Tong River	HyD's Contractor	Wang Tong River	Construction Phase	To approved Detailed Design and RLA's Approval

Appendix B Sample Data Sheet

1-hr / 24-hr TSP Air Quality Monitoring Field Operation Data Log Sheet

Station:							
Sampling Date & 7	Гime:	From:	(: a	m/pm)	Collec	tion Date:
Operators:			Weather: Wind:	Sunny Strong	Cloudy Mild	Windy Calm	Rainy
Н	igh Volu	me Sampler	Model no).			
			Blower M	Iotor Seria	l no.		
		TSP - Total Su	spended Par	rticulates (Sampler		
Equipment 1	No.				Set F	Point	
Slope, m	Į.				Interc	ept. b	
				Initial, I			Final, f
Ambient Pressure	(mmHg)	, Pa					
Ambient Temperat	ture (K),	Ta					
Delta (in. of Wate							
$Y = [W \times (Pa/760)]$) x (298/	Ta)]1/2					
		in) = (Y - b)*0.0283/m					
Elapsed Timer Ind	icator (H	lours), T					
Filter Identification							
Weight of Filter (g							
Weight of Particul							
Mean Standard Flo							
$Qstd_{avg} = (Qstd_i +$	$Qstd_f)/2$	2					
Total Time,							
	Ti) x 60						
Standard Volume, Vstd (m³) = Qstd _{av}	x Total	Time					
		_					
Particulate Conce	entration	n (μg/m³)					
Observed Construction	M	Iain Construction Site					
Activities	O	ther Construction Site					
Remarks:							
-							
Conducted by:			Signature	:		Date:	
Checked by:			Signature	:		Date:	

1-hr TSP Air Quality Monitoring

Field Operation Data Log Sheet

Equipment		Model	Equ	Equipment No. L		Last Calibration/Due Date	
							/
			•		•		
Monitoring Location							
Description of Loc	escription of Location						
Sampling Date and	d Time						
Weather Condition	n		Sunny / Fine / Cloudy / Windy / Rainy			y / Rainy	
Measuring Parameters		TSP					
			1st	hour	2nd	2nd hour 3rd h	
Count Value							
Count Value ÷60 Mass Concentration							
Site Condition	Main C	Construction Site					
	Other (Construction Site					
Remarks							
		Name		Sign	ature		Date
Recorded By							
Checked By							

Noise Monitoring

Field Record Sheet

Equipment	Model	Equipment No.	Last Calibration/Due Date
			/
			/

	Before Measurement			After Measurement		
Noise Monitoring Period	Noise Level (dB)	Freq. of Signal (KHz)	Display (dB)	Noise Level (dB)	Freq. of Signal (KHz)	Display (dB)
07:00 - 19:00						

Monitoring Location	n						
Description of Loca	ation						
Date of Monitoring							
Weather Condition			Sunny	/ Cloud	y / Rainy		
Measurement Start	Time (hh:mm)						
Measurement Time	Length (min/hr)						
Measurement	Parameter	Measured	Base	line	Actual Construc	tion Noise	Level
Results	$L_{eq} dB(A)$						
	$L_{10} dB(A)$						
	L ₉₀ dB(A)						
Major Construction	Noise Source(s)	Excavator / backhoe	;	В	Bulldozer		
During Measureme	nt	Dump truck / lorry		R	toller		
		Other, pls specify:					
Other Noise Source	e(s)	Road traffic noise		A	ir traffic noise		
During Measurement		Construction noise from other sites (e.g. piling)					
		pls specify:					
Remarks		Fa çade Measurement / Free Field Measurement					
		l					

Note

During daytime (0700-1900): 1 no. of $L_{\text{eq(30-min)}}$

	Name	Signature	Date
Recorded By			
Checked By			

Remarks: Monitoring should be cancelled if steady wind speed exceeds 5m/s or with gusts exceeding 10m/s

Marine Water Quality Monitoring Data Record Sheet

IVIALL	ne water Quanty Moni	toring Data Record Sil	<u>leei</u>
Location			
Date			
Start Time (hh:mm)			
Weather			
Sea Conditions			
Tidal Mode			
Water Depth (m)			
Monitoring Depth	Surface	Middle	Bottom
рН			
Salinity (mg/L)			
Temperature ($^{\circ}$ C)			
DO Saturation (%)			
DO (mg/L)			
Turbidity (NTU)			
SS (mg/L)			
Observed Construction	<100m from location		
Activities	>100m from location		
Other Observations			
<u>Name</u>	& Designation	<u>Signature</u>	<u>Date</u>
Record by:			
Checked by:			

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

Appendix C Event and Action Plan

Appendix C Event and Action Plan

Event and Action Plan for Construction Air Quality

EVENT	ACTION							
EVENT	ET	IEC	ER	CONTRACTOR				
ACTION LEVE	L							
1. Exceedance for one sample	 Inform IEC, ER and Contractor; Identify source, investigate the causes of exceedance and propose remedial measures; Repeat measurement to confirm finding. 	 Check monitoring data submitted by ET; Check Contractor's working method. 	1. Notify Contractor.	 Rectify any unacceptable practice; Amend working methods if appropriate. 				
2. Exceedance for two or more consecutive samples	1. Inform IEC, ER and Contractor; 2. Identify source; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC, ER and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 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/ER on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	Confirm receipt of notification of failure in writing; Notify Contractor; Ensure remedial measures properly implemented.	 Submit proposals for remedial to ER and IEC within 3 working days of notification; Implement the agreed proposals; Amend proposal if appropriate. 				

Event and Action Plan for Construction Air Quality

EVENT	ACTION							
Z V Zi V I	ET	IEC	ER	CONTRACTOR				
LIMIT LEVEL								
1.Exceedance for one sample	1. Inform IEC, ER, Contractor and EPD; 2. Identify source, investigate the causes of exceedance and propose remedial measures; 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 ER 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 ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	Confirm receipt of notification of failure in writing; Notify Contractor; Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Discuss with ET and IEC on remedial actions 3. Submit proposals for remedial actions to IEC within 3 working days of notification; 4. Implement the agreed proposals; 5. Amend proposal if appropriate.				
2.Exceedance for two or more consecutive samples	1. Notify IEC, ER, 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 ER and Contractor to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER 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 ER, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 5. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation 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 terminate that portion of work until the exceedance ceases.	1. Take immediate action to avoid further exceedance; 2. Discuss with ET and IEC on remedial actions 3. Submit proposals for remedial actions to ER and IEC within 3 working days of notification; 4. Implement the agreed proposals; 5. Resubmit proposals if problem still not under control; 6. Stop the relevant portion of works as determined by the ER until the exceedance ceases.				

Event and Action Plan for Construction Noise

EVENT	ACTION							
EVENI	ET	IEC	ER	CONTRACTOR				
Action Level	1. Notify IEC, ER and Contractor of exceedance; 2. Identify source 3. Investigate the causes of exceedance and propose remedial measures; 4. Report the results of investigation to the IEC, ER and Contractor; 5. Discuss with the IEC, ER and Contractor and formulate remedial measures; 6. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	Confirm receipt of notification of failure in writing; Notify Contractor; Require Contractor to propose remedial measures for the analysed noise problem; Ensure remedial measures are properly implemented	Submit noise mitigation proposals to ER with copy to ET and IEC; Implement noise mitigation proposals.				
Limit Level	1. Inform IEC, ER, EPD and Contractor; 2. Identify source; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	 Discuss amongst ER, ET, and Contractor on the potential remedial actions; Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; Supervise the implementation of remedial measures. 	 Confirm receipt of notification of failure in writing; Notify Contractor; Require Contractor to propose remedial measures for the analysed noise problem; Ensure remedial measures are properly implemented; If exceedance continues, investigate what portion of the work is responsible and instruct the Contractor to terminate that portion of work until the exceedance ceases. 	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER with copy to ET and IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Terminate the relevant portion of works as determined by the ER until the exceedance ceases.				

Event and Action Plan for Water Quality

EVENT	ACTION				
	ET Leader	IEC	ER	Contractor	
ACTION LEVEL					
Action level being exceeded by one sampling day	 Repeat in situ measurement on next day of exceedance to confirm findings; Identify source(s) of impact; Inform IEC, contractor and ER; Check monitoring data, all plant, equipment and Contractor's working methods. 	Check monitoring data submitted by ET and Contractor's working methods.	Confirm receipt of notification of non-compliance in writing; Notify Contractor.	Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Amend working methods if appropriate.	
	 Repeat measurement on next day of exceedance to confirm findings; Identify source(s) of impact; Inform IEC, contractor, ER and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, ER and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Action level. 	 Check monitoring data submitted by ET and Contractor's working method; Discuss with ET and Contractor on possible remedial actions; Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; Supervise the implementation of mitigation measures. 	Discuss with IEC on the proposed mitigation measures; Ensure mitigation measures are properly implemented; Assess the effectiveness of the implemented mitigation measures.	 Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment and consider changes of working methods; Submit proposal of additional mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER; Implement the agreed mitigation measures. 	

Event and Action Plan for Water Quality

EVENT	ACTION				
	ET Leader	IEC	ER	Contractor	
LIMIT LEVEL					
Limit level being exceeded by one sampling day	 Repeat measurement on next day of exceedance to confirm findings; Identify source(s) of impact; Inform IEC, contractor, ER and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, ER and Contractor. 	 Check monitoring data submitted by ET and Contractor's working method; Discuss with ET and Contractor on possible remedial actions; Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly. 	 Confirm receipt of notification of failure in writing; Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to review the working methods. 	 Inform the ER and confirm notification of the non-compliance in writing; Rectify unacceptable practice; Check all plant and equipment and consider changes of working methods; Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER. 	
Limit level being exceeded by two or more consecutive sampling days	 Repeat measurement on next day of exceedance to confirm findings; Identify source(s) of impact; Inform IEC, contractor, ER and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IEC, ER and Contractor; Ensure mitigation measures are implemented; Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days. 	 Check monitoring data submitted by ET and Contractor's working method; Discuss with ET and Contractor on possible remedial actions; Review the Contractor's mitigation measures whenever necessary to assure their effectiveness and advise the ER accordingly; Supervise the implementation of mitigation measures. 	 Discuss with IEC, ET and Contractor on the proposed mitigation measures; Request Contractor to critically review the working methods; Make agreement on the mitigation measures to be implemented; Ensure mitigation measures are properly implemented; 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. 	 Take immediate action to avoid further exceedance; Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER; Implement the agreed mitigation measures; Resubmit proposals of mitigation measures if problem still not under control; As directed by the Supervising Officer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level. 	

Appendix D Interim Notifications of Exceedances

Sample Template for Interim Notifications of Environmental Quality Limits Exceedances

Report No.:			
Monitorin	ng Date		
Monitoring I	Parameter		
Action I	Level		
Limit L	evel		
Monitoring	Station		
Measured	Level		
Level Exc	ceeded		
Cause of Exceedances			
Action required under the	e Event and Action Plan		
Action taken under the Ev	vent and Action Plan		
ET's conclusions and reco	ommendations for mitigation		
Contractor's actions to im	nplement the mitigation		
Contractor's comment			
Prepared by:	Signature:	Date:	
Reviewed by:	Signature:	Date:	