A Rooftop Helipad at New Acute Hospital at Kai Tak Development Area

Environmental Monitoring and Audit Manual (Final)

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Submitted to

Wong Tung & Partners Limited

Hospital Authority

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1.0 INTRODUCTION

1.1 Background

1.1.1.1 The New Acute Hospital (NAH), which has commenced foundation works at Sites 3C1(A) and 3C1(B) in the Former South Apron area of KTDA, will be a major acute hospital in central Kowloon providing a comprehensive range of acute hospital services, with modern service models, technology and facilities. The NAH is proposed to serve the general public for meeting the demand for medical services arising from the growing and ageing population in Kowloon. The new hospital will comprise an Accident & Emergency Department (AED), an oncology centre and provide enhanced neuroscience services, with a total planned capacity of around 2,400 in-patient and day beds and 37 operating theatres for the KTDA.

1.1.1.2 In order to provide the essential rapid and seamless transfer of patients/ survivors for prompt and appropriate treatment, it is essential for the hospital to have a helipad directly located above the AED at the rooftop of the Acute Block building. In addition, the helipad will serve as an effective alternative to convey "quick response" medical teams from the NAH campus to the scenes of incidents, if a situation requires rescue efforts.

1.1.1.3 Based on the above, it is proposed to construct and operate a helipad ("the Project") on the roof of the Acute Block of the NAH to enhance the overall efficiency and effectiveness of the emergency response of the NAH. The location of the proposed helipad and its environs are shown in **Figure 1.1**.

1.1.1.4 The Project Proponent is the Hospital Authority (HA) and they have commissioned Wong Tung & Partners Ltd. (WTPL) as the Architectural Consultant for the design of the NAH and the proposed helipad. Meinhardt Infrastructure and Environment Limited (MIEL) has been simultaneously appointed by WTPL to provide consultancy services in respect of this Project including preparation of an Environmental Impact Assessment (EIA) Study.

1.1.1.5 The EIA Study Brief for A Rooftop Helipad at New Acute Hospital at Kai Tak Development Area includes the requirement to prepare an Environmental Monitoring and Audit (EM&A) programme and to document this in an EM&A Manual. This EM&A Manual is prepared in accordance with Annex 21 of the Technical Memorandum on EIA Process and the EIA Study Brief for the Project and follows the approach recommended in the EM&A Guidelines for Development Projects in Hong Kong.

1.2 Purpose of the EM&A Manual

1.1.1.6 The purpose of this EM&A Manual is to set out the EM&A programme for the Project to check the predictions and to ensure compliance with relevant environmental protection legislations, and effectiveness of the mitigation measures recommended in the EIA report. It aims to provide systematic procedures for the monitoring, auditing and minimising of environmental impacts associated with the activities of the Project.

1.3 Structure of the EM&A Manual

1.3.1.1 This EM&A Manual contains the following information:

- The responsibilities of the Project Proponent, Contractor, Engineer or Engineer's Representative, Environmental Team (ET), Environmental Team Leader (ETL) and the Independent Environmental Checker (IEC) with respect to the EM&A requirements during the course of the Project;
- The requirements with respect to the construction schedule and the EM&A programme to track the varying environmental impacts;
- The requirements for reviewing the pollution sources and working procedures required in the event of the non-compliance with environmental criteria and complaints;
- The requirements for appropriate reporting procedures; and
- The requirements for reviewing the effectiveness of mitigation measures/environmental management systems and the EM&A programme.

1.3.1.2 The EM&A Manual is divided into the following sections:

- Section 1 presents the introduction to the EM&A Manual;
- Section 2 presents a description of the proposed Project;
- Section 3 presents the Project Organisation;
- Section 4 sets out auditing requirements for air quality impact;
- Section 5 sets out auditing requirements for hazard to life impact;
- Section 6 sets out auditing requirements for noise impact;
- Section 7 details auditing requirements for waste management implications;
- Section 8 presents the findings of visual impact assessment;
- Section 9 presents the findings of water quality impact assessment;
- Section 10 describes the scope and frequency of the environmental site audits and sets out the general requirements of the EM&A programme; and
- Section 11 details the EM&A reporting requirements.

2.0 PROJECT DESCRIPTION

2.1 Site Location

2.1.1.1 Based on the strategic location and role delineation in accordance to the long term Clinical Services Plan for Kowloon Central Cluster (KCC) by HA, the NAH will, be a designated trauma centre to cater for critically ill patients with emergency conditions and respond to major incidents with multiple casualties. The helipad will be constructed on the roof of the Acute Block of the NAH to further enhance the overall efficiency and effectiveness of the emergency response of the NAH.

2.1.1.2 The Project Site for the helipad is proposed on the roof of the Acute Block of the NAH, which will be located at the southern part of Site A. The location of the proposed helipad and its environs are shown in **Figure 1.1**. A drawing showing all environmental sensitive areas including air, noise and water sensitive receivers is provided in **Figure 2.1**.

2.2 Design of the Project

2.2.1.1 The helipad will be constructed at the west corner on the roof of the proposed Acute Block of the NAH and there will be no fuelling facilities provided at this location.

2.2.1.2 The helipad at approximately +119.15mPD will be of a circular shape of about 30m in diameter and elevated from the main roof level of the Acute Block at about +111.0mPD, subject to planning constraints as well as design development. Major components of the helipad will consist of the elevated helipad structure, covered safety walkway, associated egress staircase, noise barrier etc. The helipad control room and waiting room will be within the NAH building. The current provision of the control room is located directly beneath the helipad; a waiting area for embarking and debarking patients is located at the lobby of the hot lifts. The control room and waiting room are part of the NAH building; and their construction will be under the scope of NAH superstructure contract and not within the scope of this Project. Ancillary supporting facilities including electrical and mechanical (E&M) plant rooms, area lighting, fire services equipment, markings, cleaning and maintenance will, also, be provided.

2.2.1.3 According to the preferred construction method, the helipad deck and associated supporting structural frame is constructed by steel structure prefabricated off-site outside Hong Kong territories. The safety walkway and access ramp would be formed by prefabricated steel members of a suitable size and weight and to be assembled on site by welding or bolting. The tentative construction activities consist of the following:

- Construction of safety walkway and access ramp;
- In-situ steel structure, aluminum and formworks prefabricated on site; and
- Assemble parts by welding or bolting.

2.2.1.4 This helipad facility will be used for emergency patients and casualties' transportation, and also for urgent transportation of organs for transplantation, therefore, there are no arrangements for commercial and planned flights except trial flights. The operation, management and maintenance of the helipad will be undertaken by Hospital Authority (HA), while the GFS will be the user of this helipad, providing emergency medical transfers and services for general public.

2.3 Development Programme

2.3.1.1 The tentative planning and implementation programme for Project are shown in **Table 2.1** below:

Table 2.1 Tentative Programme of the Project

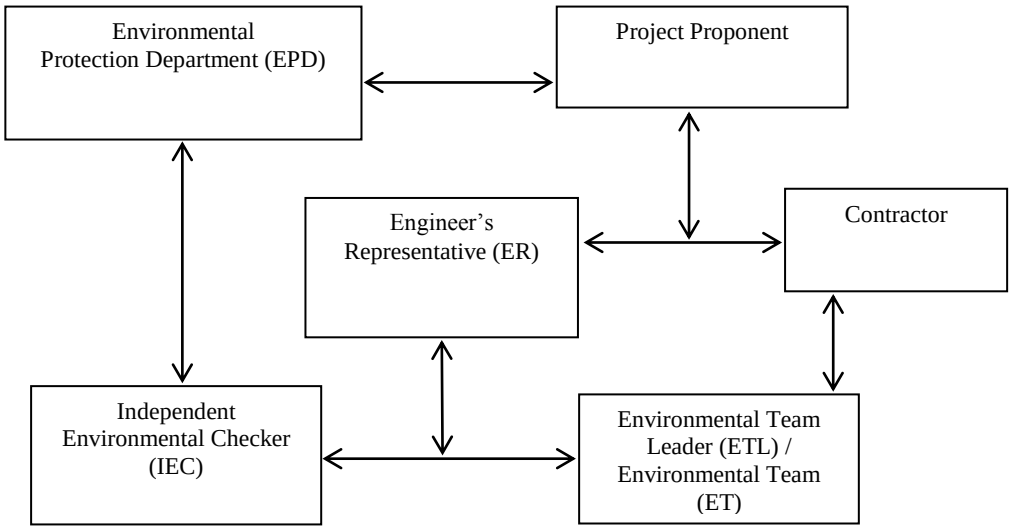
Activities	Key Milestone Dates
Design of the Project	Since September 2017
Construction of the Project	Q4 2023 to Q4 2024
Operation of the Project	2025

Note: Construction of the Foundation works and Superstructure works for the New Acute Hospital is not part of the Project. Construction of the Foundation for the New Acute Hospital has commenced in Q3 2018 for completion in Q4 2021. Construction of the Superstructure for the New Acute Hospital would commence in Q4 2021 for completion in Q4 2024. The major superstructure work is estimated to be completed in Q3 2023.

3 PROJECT ORGANISATION

3.1 Background

3.1.1.1 The Project organisation is defined below.



3.1.1.2 The roles and responsibilities of various parties involved in the EM&A process and the organisational structure of the parties responsible for implementing the EM&A programme are outlined in the sections below.

3.2 The Project Proponent

3.2.1.1 The Project Proponent initiates the Project and is responsible for overseeing the construction works and ensuring the works to be undertaken by the Engineer and Contractor in accordance with the specifications and contractual requirements. The Project Proponent will cooperate with the Engineer in various issues with respect to the EM&A programme include:

- To oversee the Engineer and Contractor's activities and ensure the requirements in the EM&A Manual to be fully complied with;
- To discuss with the Engineer when action is required to reduce the environmental impacts in accordance with the Event and Action Plans;
- To liaise with relevant parties if complaints on environmental issues are received; and
- To cooperate with the Engineer and Contractor to ensure smooth implementation of the environmental mitigation measures.

3.3 The Engineer or Engineer's Representative (ER)

3.3.1.1 The Engineer is responsible for overseeing the construction works and ensuring the works to be undertaken by the Contractor in accordance with the specifications and contractual

requirements. The duties and responsibilities of the Engineer with respect to the EM&A programme include:

- To supervise the Contractor's activities and ensure the requirements in the EM&A Manual to be fully complied with;
- To inform the Contractor when action is required to reduce the environmental impacts in accordance with the Event and Action Plans;
- To lead the regular site inspections and audits attended by the Contractor and ET/ETL;
- To adhere to the procedures for carrying out the complaint investigation; and
- To ensure a qualified IEC is employed as required under the relevant requirements under the EIAO.

3.4 Contractor

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

- To implement the recommendations and requirements of the EM&A Manual;
- To provide assistance to the ET in carrying out the relevant environmental inspection and audit;
- To submit the proposals of mitigation measures in case of adverse environmental impact identified ;
- To implement the mitigation measures to reduce the environmental impacts; and
- To adhere to the procedures for carrying out the complaint investigation as required in the EM&A Manual.

3.5 Environmental Team (ET)

3.5.1.1 The ET will conduct the EM&A programme to ensure the Contractor's compliance with the Project's environmental requirements during the construction phase.

3.5.1.2 The ET shall be led and managed by an Environmental Team Leader (ETL), who shall possess at least 7 years of experience in EM&A. The ET shall monitor the mitigation measures implemented by the Contractor on a regular basis to ensure the compliance with the intended aims of the mitigation measures. The duties and responsibilities of the ET are:

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

- To analyse the EM&A results, review the success of EM&A programme to confirm the adequacy of mitigation measures implemented, and to identify any adverse environmental impacts arising and report the EM&A results to the IEC, Contractor, and Engineer;

- To prepare the reports of site inspection and site environmental conditions; and

- To review the proposals of mitigation measures by the Contractor in case of adverse environmental impact identified.

3.6 Independent Environmental Checker (IEC)

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

- To review and audit in an independent, objective and professional manner in all aspects of the EM&A programme;

- To review the EM&A Manual prior to the commencement of the works, and provide comments for the ET to update as required before submitting to EPD;

- To conduct random site inspections during construction;

- To audit the recommendations and requirements of the EIA against the status of the implementation of environmental protection measures on-site;

- To review the effectiveness of the environmental mitigation measures and environmental performance of the Project;

- On as-needed basis, to verify and certify the environmental acceptability of Contractor's construction methodology (both temporary and permanent works), including relevant design plans and submissions;

- To verify the investigation results of the environmental complaints and the effectiveness of corrective measures;

- To verify the EM&A reports that have been certified by the ETL; and

- To provide feedback of the audit results to the ET/Project Proponent according to the requirements in the EM&A manual.

4.0 AIR QUALITY

4.1 Introduction

4.1.1.1 The air quality impact assessment for the Project concluded that, with the implementation of the dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation, good site practices and proposed mitigation measures, adverse air quality impacts would not be anticipated from the construction and operation of the proposed helipad. Thus, neither construction stage dust monitoring nor operation stage air quality impact monitoring is considered necessary.

4.1.1.2 However, the ET shall check the Contractor's implementation of air quality control measures during regular site environmental audit. The requirements of the site audit and their frequency are detailed in **Section 9** of this report.

4.2 Mitigation Measures

4.2.1.1 Mitigation measures for air quality during construction phase have been recommended in the EIA Report. The Contractor shall be responsible for the design and implementation of these measures. The ET Leader is responsible for formulating an environmental site inspection, deficiency and action reporting system, and for carrying out site inspections under the EM&A programme.

4.2.1.2 The Contractor shall be responsible for implementing all applicable dust control measures as recommended in the Air Pollution Control (Construction Dust) Regulation, Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation, ETWB TCW No. 19/2005 and good site practices. The ET shall include but not limited to the following items as part of their site inspections:

a) Heights from which materials are dropped shall be restricted as far as practicable to minimise the fugitive dust arising from unloading/loading;

b) Use of regular watering to reduce dust emissions from exposed site surfaces, particularly during dry weather;

c) Immediately before leaving a construction site, every vehicle shall be washed to remove any dusty materials from its body and wheels;

d) Vehicles that have the potential to create dust while transporting materials should be covered, with the cover properly secured and extended over the edges of the side and tail boards;

e) Travelling speeds should be controlled to reduce traffic induced dust dispersion and re-suspension within the site from the operating haul trucks;

f) Where a vehicle leaving a construction site is carrying a load of dusty materials, the load shall be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle; and

g) Any stockpile of dusty materials shall be either: (a) covered entirely by impervious sheeting; (b) placed in an area sheltered on the top and the 3 sides; or (c) sprayed with water or a dust suppression chemical so as to maintain the entire surface wet.

4.3 Audit Requirements

4.3.1.1 No construction stage dust monitoring or operation stage air quality impact monitoring is considered necessary.

4.3.1.2 Regular site inspections and audit of at least once per week shall be carried out by the ET to ensure that the recommended good site practices and other mitigation measures are implemented by the Contractor during construction stage.

5.0 HAZARD TO LIFE

5.1 Introduction

5.1.1.1 As the flight paths of the helicopter are close to the airspace above the LPG Filling station and the Kerry Dangerous Goods Warehouse (Kowloon Bay) (KDGW). Quantitative Risk Assessment (QRA) has been conducted with the objective of identifying potential hazards involved during the construction and operation phase of the helipad. QRA was conducted to evaluate the risk associated with the proposed helipad at the Acute Hospital. The risk, both in terms of individual risk and societal risk, has been found to be in compliance with the risk criteria stipulated in Section 2 of Annex 4 of the TM-EIAO.

5.2 Mitigation Measures

5.2.1.1 Mitigation measures for risk includes providing professional trainings and guidelines to the helicopter pilots in order to ensure the pilots be familiar with the procedures to avoid approaching near the smoke plume in event of a major fire accident at KDGW.

5.2.1.2 Since both individual risk and societal risk posed by the proposed helipad at Acute Hospital meet the criteria of Hong Kong Risk Guidelines, no further mitigation measures are required.

5.3 Audit Requirements

5.3.1.1 No monitoring or audit is considered necessary for construction phase or operation phase.

6.0 NOISE

6.1 Introduction

6.1.1.1 During construction phase for the proposed helipad, powered mechanical equipment (PME) used in helipad construction would be the primary noise source. Key construction activities would be assembling the steel framework, helipad structure, safety covered walkway, access ramp and building the proposed noise mitigation measures (that is, the permanent noise barrier and noise reducer).

6.1.1.2 Potential construction noise impact has been assessed at the representative Noise Sensitive Receiver (NSR) in the EIA report. The calculations show that there is no noise exceedance of the relevant construction phase noise criterion with the implementation of recommended mitigation measures. Hence, noise monitoring is not recommended.

6.1.1.3 During the operation phase of the Project, the main noise source would be from the helicopter operations associated with the proposed helipad. It should be noted that the Noise Control Ordinance (Cap.400) does not apply to noise caused by aircraft. With the implementation of recommended noise mitigation measures such as setback of helipad, noise barriers and noise reducers and carefully designated flight paths, there would be no noise exceedance of the relevant noise criterion at the representative NSRs. The proposed helipad is solely for emergency use and transportation of organs where the anticipated usage being less than once per day on average. Operational noise monitoring is impracticable as there are no arrangements for commercial and planned flights except trial flights and so noise monitoring during operational phase is not recommended.

6.2 Mitigation Measures

Construction Phase

6.2.1.1 The following mitigation measures have been recommended for implementation for the Project to minimise potential noise impact upon NSRs during construction phase:

- Quiet powered mechanical equipment (QPME) shall be used, and PME shall also be serviced regularly during the construction programme;
- Only well maintained plants shall be used in the construction of the Project; and
- Machines and plant that may be in intermittent use should be shut down between works periods or throttled down to a minimum between work periods.

6.2.1.2 Besides, the "Recommended Pollution Control Clauses for Construction Contracts" published by the EPD should be adopted in the Contract Specification for the Contractors to follow and implement relevant measures and good site practices in minimising noise impact.

Operational Phase

6.2.1.3 The following practical measures have been confirmed with the Government Flying Service (GFS) which will be implemented for helicopter operation to and from the proposed helipad:

- GFS Helicopters - The seven new medium-sized single-model helicopter (Airbus H175) which provide a quieter flight in general, have been adopted by the GFS; and

- Flight Sectors - The flight sectors are carefully chosen, and a buffer distance for flight paths will be maintained to fly away from NSRs. In addition, one-way-direction for approaching and take-off, subject to flight condition, is recommended to minimise the overall exposure of NSRs to helicopter noise;

6.2.1.4 Besides, the following mitigation measures have been recommended for implementation for the Project to minimise potential noise impact upon NSRs during operation phase:

- Setback of Helipad - Relocation of the proposed helipad to the western side of the rooftop of the Acute Block of NAH to reduce the noise impact and direct line of sight at NSRs. The separation distances between the helipad and the nearest NSRs are also maximised; and

- Screening by Noise Barrier and Noise Reducers – Installation and maintenance of noise barrier at the rooftop of the Acute Block of NAH to provide noise screening to the Proposed Helipad during hovering, approaching, take-off and idling on the helipad. In addition, noise reducers shall be used to further alleviate noise impact.

6.2.1.5 The local community may lodge noise complaints with the relevant authority. Upon receipt of complaints from the public or any concerned parties, Hospital Authority (HA) shall undertake the following procedures:

1) The complaint shall be recorded in a complaint database and reviewed by HA and GFS;

2) Investigate the complaint and determine its validity as well as the source of the problem by HA and GFS;

3) Identify mitigation measure(s) by HA and GFS; and

4) Report the findings and follow-up actions to the complainant or the concerned parties by HA.

6.3 Audit Requirements

6.3.1.1 Based on the assessment results and with the implementation of relevant noise mitigation measures recommended in the EIA report, no adverse noise impact is anticipated during construction and operation phase. Hence, noise monitoring during construction and operation phase is considered not necessary. However, regular site inspections by the ET during the construction phase of at least once per week are recommended to ensure the Contractor has effectively implemented good working practices to minimise construction noise as far as possible.

7.0 WASTE MANAGEMENT

7.1 Introduction

7.1.1.1 Waste management during the construction phase will mainly be the responsibility of the Contractor, who shall implement the mitigation measures recommended in the EIA Report in order to minimise waste or resolve the issues associated with the management of wastes. The Contractor shall also ensure that all wastes produced during the construction phase would be handled, stored and disposed of in accordance with good waste management practices, relevant legislation and waste management guidelines. Wastes generated from the construction activities, such as the construction and demolition (C&D) materials, shall be audited at regular intervals to ensure that proper storage, transportation and disposal practices are undertaken. Such audits would ensure that the wastes generated would be properly disposed of.

7.1.1.2 No significant wastes are expected to be generated from the operational phase of the Project and no adverse environmental impacts would arise with the implementation of good waste management practices. Therefore, an audit programme for the operational phase will not be required.

7.2 Mitigation Measures

7.2.1.1 With the proper handling, storage and disposal of wastes arising from the construction works as recommended in the EIA Report and summarised in the Environmental Mitigation Implementation Schedule (EMIS) in Appendix A of this EM&A Manual, the potential for adverse environmental impacts is minimised. During weekly site inspections and audits, the Engineer and ET shall pay special attention to the issues relating to the waste management and check whether the Contractor has implemented the recommended good site practices and other mitigation measures on waste management. The following waste management measures shall be implemented by the Contractor:

- The requirements as stipulated in the ETWB TC(W) No.19/2005 Environmental Management on Construction Sites and the other relevant guidelines should be included in the Particular Specification for the Contractor as appropriate.

- The Contractor should submit a Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) to Architect/Engineer for approval prior to the commencement of construction work, in accordance with the ETWB TC(W) No.19/2005 so as to provide an overall framework of waste management and reduction. The WMP should include:

  – Waste management policy;

  – Record of generated waste;

  – Waste reduction target;

  – Waste reduction programme;

  – Role and responsibility of waste management team;

  – Benefit of waste management;

  – Analysis of waste materials;

  - Reuse, recycling and disposal plans;
  - Transportation process of waste products; and
  - Monitoring and action plan.

- The waste management hierarchy, which includes the following in descending preference, should be strictly followed:
  - Avoidance and reduction of waste generation;
  - Reuse of materials as far as practicable;
  - Recovery and recycling of residual materials where possible; and
  - Disposal according to relevant legislations, guidelines and good practices.
- This hierarchy should be adopted to evaluate the waste management options in order to maximise the extent of waste reduction and cost reduction. The records of quantities of waste generated, recycled and disposed (locations) should be properly documented.
- A trip-ticket system should be established in accordance with DevB TC(W) No. 6/2010 and Waste Disposal (Charges for Disposal of Construction Waste) Regulation to monitor the disposal of inert C&D materials to public fill and solid wastes to landfills, and to control fly-tipping. A trip-ticket system would be included as one of the contractual requirements for the Contractor to strictly implement. The Engineer would also regularly audit the effectiveness of the system.
- The Contractor should also provide proper training to workers regarding the appropriate concepts of site cleanliness and waste management procedures, e.g. waste reduction, reuse and recycling all the time.
- The site and surroundings shall be kept tidy and litter free.
- No waste shall be burnt on-site.
- Prohibit the Contractor to dispose of inert C&D materials at any sensitive locations e.g. natural habitat, etc. The Contractor should propose the final disposal sites in the EMP and WMP for the Architect/ Engineer's approval before implementation.
- The Contractor should recycle as much of the non-inert C&D materials as possible on-site. The non-inert C&D waste should be segregated and stored in separate containers or skips to facilitate the reuse or recycling of materials and proper disposal.
- The Contractor shall register as Chemical Waste Producers with the EPD. Chemical waste should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes as follows:
  - The containers used for storing chemical waste should be suitable for the substance to be held, resistant to corrosion, maintained in good conditions and securely closed;

- The containers should have a capacity of <450L unless the specifications have been approved by the EPD;
- The label on the containers should be clearly labelled in English and Chinese and comply with the requirements prescribed in Schedule 2 of Waste Disposal (Chemical Waste) (General) Regulation;
- The storage area for the chemical waste should be used solely for the storage of chemical wastes;
- The storage area should be enclosed on at least three sides by a wall, partition or fence with a height of not less than two metres or the total height of containers in stack, whichever is less;
- Where containers of liquid chemical wastes are stored, the area should be designed with impermeable floor and provided with a bund with capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in the area, whichever is greatest;
- Adequate ventilation should be allowed in the storage area by leaving some space between the top of the enclosure walls and the ceiling, or provision of louvers on the sides of the enclosure walls;
- The storage area should be sufficiently covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and
- Separate containers should be used for packing different types of waste or waste arising from different sources and process to minimise mixing of incompatible materials.
- Drip tray should be provided to chemical waste containers. The drip tray should be clean up regularly. Clean up should be done before foreseeable inclement weather such as typhoon or heavy rain.

- Waste oils, chemicals or solvents shall not be disposed of to drain.
- General refuse arising on-site should be stored in enclosed bins or compaction units separately from C&D materials/ wastes and chemical wastes. Sufficient bins shall be provided for storage of general refuse as required under the Public Cleansing and Prevention of Nuisances Regulation. In addition, general refuse shall be cleared daily and shall be disposed of to the nearest landfill or refuse transfer station. Burning of refuse on construction sites is prohibited. Disposal of general refuse is recommended before foreseeable inclement weather such as typhoon or heavy rain.
- All waste containers shall be in a secure area on hardstanding.
- Segregation and storage of different types of waste should be promoted to facilitate the reuse and recycling of the materials. Separately labelled bins for the deposition of aluminum cans, paper and plastic bottles etc. should be provided as far as practicable. Participation in a local collection scheme by the Contractor should be advocated.

7.3 Audit Requirements

7.3.1.1 Weekly site inspections and audits shall be carried out by the ET, as detailed in **Table 6.1**, to ensure that the recommended good site practices and other mitigation measures are implemented by the Contractor. The inspections and audits shall look at all aspects of on-site waste management practices including the waste generation, storage, recycling, transport and disposal. Documents including licenses, permits, disposal and recycling records shall be reviewed and audited for the compliance with the legislation and contract requirements.

Table 7.1 Waste Management Checklist

Activities	Timing	Audit/ Inspection Frequency	If non-compliance, Action Required
All necessary waste disposal permits or licences have been obtained	Before commencement of works	Once	Apply for the necessary permits/ licences prior to disposal of the waste. The ET shall ensure that corrective action has been taken.
Only licensed waste haulers are used for waste collection.	Throughout the works	Weekly	The ET shall inform the ER and IEC of the non-compliance. The ER shall instruct the Contractor to use a licensed waste hauler. The Contractor shall temporarily suspend waste collection of that particular waste until a licensed waste hauler is used. Corrective action shall be undertaken within 48 hours.
Records of quantities of wastes generated, recycled and disposed are properly kept. For demolition material/waste, the number of loads for each day shall be recorded (quantity of waste can then be estimated based on average truck load. Should landfill charging be implemented, the receipts of the charge could be used for estimating the quantity).	Throughout the works	Weekly	The Contractor shall estimate the missing data based on previous records and the activities carried out. The ET shall audit the results and forward to the ER and IEC for approval.
Wastes are removed from site in a timely manner. General refuse is collected on a daily basis.	Throughout the works	Weekly	The ET shall inform the ER and IEC of the non-compliance. The ER shall instruct the Contractor to remove waste accordingly.
Waste storage areas are properly cleaned and do not cause windblown litter and dust nuisance.	Throughout the works	Weekly	The ET shall inform the ER and IEC of the non-compliance. The ER shall instruct the Contractor to clean the storage area and/or cover the waste.
Different types of waste are segregated in different containers or skip to enhance recycling of material and proper disposal of waste.	Throughout the works	Weekly	The ET shall inform the ER and IEC of the non-compliance. The ER shall instruct the Contractor to provide separate skips/ containers. The Contractor shall ensure the workers place the waste in the appropriate containers.

Activities	Timing	Audit/ Inspection Frequency	If non-compliance, Action Required
Chemical wastes are stored, handled and disposed of in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes, published by the EPD.	Throughout the works	Weekly	The ET shall inform the ER and IEC of the non-compliance. The ER shall instruct the Contractor to rectify the problems immediately. Warning shall be given to the Contractor if corrective actions are not taken within 24 hrs and the Regional Office of EPD shall be notified.
Demolition material/waste in dump trucks are properly covered before leaving the site.	Throughout the works	Weekly	The ET shall inform the ER and IEC of the non-compliance. The ER shall instruct the Contractor to comply. The Contractor shall prevent trucks from leaving the site until the waste are properly covered.
Wastes are disposal of at licensed sites.	Throughout the works	Weekly	The ET shall inform the ER and IEC of the non-compliance. The ER shall warn the Contractor and instruct the Contractor to ensure the wastes are disposed of at the licensed sites. Should it involve chemical waste, the Regional Office of EPD shall be notified.

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

8.0 VISUAL

8.1 Introduction

8.1.1 The visual impact associated with the construction and operation phases of the Helipad has been assessed. Significant visual impacts are not predicted during the construction and operational phases and, hence, no EM&A is required.

8.2 Mitigation Measures

8.2.1 With the proper mitigation measures as recommended in the EIA Report, the potential for adverse visual impact is minimised. Mitigation measures during operational phase shall be implemented by Hospital Authority (HA)/ Government Flying Service (GFS) in order to control the lighting impacts to the VSRs during operation at nighttime, which includes:

- landing light of the helicopter would be switched on during approach and departure;
- perimeter lights on the helipad will be switched on during approach mode to take-off mode of the helicopter only;
- perimeter lights will be inset into the helipad emitting upward; and
- minimise the external reflectance of the noise barrier material with the use of laminated glass.

8.3 Audit Requirements

8.3.1 Potential visual impacts during construction and operational phase have been evaluated. The impacts are considered to be insignificant and, hence, no inspection or audit is required.

9.0 WATER QUALITY

9.1 Introduction

9.1.1.1 The water quality impact associated with the construction and operational phases of the Project has been evaluated in the EIA report. No adverse water quality impact is predicted during the construction phase and operational phase. Hence, water quality monitoring is not considered necessary during the construction and operation of the Project.

9.2 Mitigation Measures

Construction Phase

9.2.1.1 In order to address the potential surface runoff during the construction phase of the Project Site, appropriate measures will be implemented in accordance with the guidelines stipulated in Professional Persons Environmental Consultative Committee Practice Note during the construction works to properly control site runoff and drainage and to minimise potential water quality impacts. Major relevant measures are highlighted below:

- All drainage facilities and erosion and sediment control structures shall be regularly inspected and maintained to ensure their proper and efficient operation at all times particularly following rainstorms;
- Precautions to be taken at any time of the year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted and during or after rainstorms, are summarised in Appendix A2 of ProPECC PN 1/94;
- The construction solid waste, debris and rubbish on-site shall be collected, handled and disposed of properly to avoid causing any water quality impacts; and
- Chemical waste shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.

Operational Phase

9.2.1.2 The design of the operational phase mitigation measures shall follow Professional Persons Environmental Consultative Committee Practice Note on Drainage Plans (ProPECC PN 5/93), which provides useful non-statutory guidelines for pollution control on different types of discharge to minimise water quality impacts from proposed drainage systems. The design incorporates the potential wastewater generated from the foam system and direct to the appropriate sewerage system.

9.2.1.3 A WPCO effluent discharge licence for discharging of the foam water will be obtained from EPD before commencement of operation, if required. No adverse water quality impact is anticipated during operational phase with the guidelines and measures stipulated in ProPECC PN 5/93 followed. Hence, no further mitigation measure is required.

9.3 Audit Requirements

9.3.1.1 Water quality monitoring is not considered necessary during the construction and operation of the Project.

9.3.1.2 Weekly site inspections shall be carried out by the ET during the construction phase to ensure that the recommended good site practices and other mitigation measures are implemented by

the Contractor. Apart from site inspections, documents including wastewater discharge licenses shall be reviewed and audited for the compliance with the legislation and contract requirements.

10.0 ENVIRONMENTAL AUDIT

10.1 Site Inspection

10.1.1.1 Site inspection provides a direct means to trigger and enforce the specified environmental protection and pollution control measures are in compliance with the contract specifications. They shall be undertaken regularly and routinely by ET to inspect the activities at the works site in order to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented by the Contractor in accordance with the EM&A recommendations. With well-defined pollution control and mitigation specifications and a well-established site inspection, deficiency and action reporting system, the site inspection is one of the most effective tools to enforce the environmental protection requirements on the site.

10.1.1.2 The ET is responsible for the formulation of an environmental site inspection, deficiency and remedial action reporting system and for carrying out the site inspection works. In consultation with the Independent Environmental Checker (IEC), the ET shall prepare a procedure for the site inspection, deficiency and remedial action reporting requirements and submit this to the Contractor for agreement and to the Engineer's Representative (ER) for approval within 21 days of commencement to the construction contract.

10.1.1.3 The ET shall conduct a site inspection at least once per week during the construction period of the Project. The areas of inspection shall include, but are not be limited to, the environmental situation, and pollution control and mitigation measures within the site. The implementation schedule of mitigation measures is summarised in **Appendix A**. It shall also review the environmental situation outside the site area that is likely to be affected, directly or indirectly, by the site activities. The ET Leader shall make reference to the following information in conducting the inspection:

- The EIA recommendations on environmental protection and pollution control mitigation measures with regard to air quality, noise, waste management;
- On-going results of the EM&A programme;
- Works progress and programme;
- Individual works methodology proposals (which shall include proposals on associated pollution control measures);
- The contract specifications on environmental protection and pollution prevention;
- The relevant environmental protection and pollution control laws, ProPECC Notes; and
- Previous site inspection results.

10.1.1.4 The Contractor shall update with the ET on all relevant information of the contract for him to carry out the site inspections. The site inspection results and associated recommendations on improvements to the environmental protection and pollution control works shall be submitted, in a site inspection proforma (see **Appendix B**), by the ET to the IEC, the ER and the Contractor within 24 hours for reference and for taking immediate action. The Contractor shall follow the procedures and time-frame as stipulated in the environmental site inspection, deficiency and action reporting system formulated by the ET to report on any remedial measures subsequent to the site inspections.

10.1.1.5 The ER, ET, IEC and Contractor shall conduct ad hoc site inspections if significant environmental problems are identified. The IEC shall also conduct random site audits and inspections. Inspections may also be required subsequent to receipt of any environmental complaints (an example of the complaint log is provided in **Appendix C**), or as part of the investigation work, for environmental monitoring and audit.

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

10.2 Environmental Complaints

10.2.1.1 Complaints shall be referred to the ET Leader for carrying out complaint investigation procedures. The ET Leader shall prepare a flow chart of the complaint response procedures that addresses, complaint receiving channels, responsible parties/contacts for information, the investigation process, procedures for the implementation of mitigation/remedial action, guidelines for communication and public relation with the complainant etc. The flow chart shall be agreed by all parties and issued to the Contractor, ER and IEC for reference.

10.2.1.2 The ET Leader shall undertake the following procedures upon receipt of a complaint:

- Log the complaints and dates of receipt onto the complaint database to be kept by the Contractor and inform the Engineer, ER and IEC immediately;
- Investigate with the Engineer/ ER and Contractor the complaints to determine their validity, and assess whether the source of the problems is due to the construction works activities;
- Identify the mitigation measures if the complaints are valid and due to the construction works of the project;
- Advise the Contractor if mitigation measures are required;
- Review the Contractor's responses to the identified mitigation measures, and the updated situation;
- Undertake additional audit in order to verify the situation if necessary, and review that the circumstances leading to the complaints would not recur;
- If the complaint is referred by the EPD, to submit interim report to the EPD on the status of the complaint investigations and follow-up action within the time frame assigned by the EPD; and
- Record the complaints, investigations, subsequent action and findings in the monthly EM&A reports.

10.2.1.3 A flow chart of the complaint response procedures during construction phase is shown in **Figure 10.1**.

10.3 Documentation

10.3.1.1 All documentation is required to be filed in a traceable and systematic manner and ready for inspection upon request. All EM&A results and findings shall be documented in the monthly

EM&A reports prepared by the ET and verified by IEC prior to circulation to the Contractor, ER and submitted to EPD.

11.0 REPORTING

11.1 Introduction

11.1.1.1 The following reporting requirement are based upon a paper-documented approach. However, the same information shall be provided in an electronic medium upon agreeing the format with the ER and EPD.

11.2 Deliverables

11.2.1 First Monthly EM&A Report

11.2.1.1 The First Monthly EM&A Report shall include at least, but not be limited to, the following information:

- Executive Summary (1-2 pages):
  - Complaint log;
  - Notification of any summons and successful prosecutions;
  - Reporting changes; and
  - Future key issues.
- Basic project information:
  - The project organisation including key personnel contact names and telephone numbers;
  - The construction programme;
  - The management structure; and
  - Works undertaken during the reporting month.
- Environmental status:
  - Advice on the status of statutory environmental compliance, such as the status of compliance with the environmental permit (EP) conditions under the EIAO, schedule and progress of any submissions as required under the EP application of Construction Noise Permit (CNP), Waste Water Discharge License in accordance to Water Pollution Control Ordinance (WPCO), C&D Waste Disposal, Chemical Waste Disposal License, etc;
  - Advice on the status of the implementation of mitigation measures, etc.;
  - Works undertaken during the reporting month with illustrations (e.g. location of works, etc); and
  - Drawings showing the project area, environmental sensitive receivers.
- Implementation status:

- 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.

- The report on the non-compliances, complaints, notifications of summons and status of prosecutions:

  - Records of all complaints received (written or verbal), including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;

  - Records 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;

  - The review of the reasons for and implications of non-compliances, complaints, summons and prosecutions including the review of pollution sources and working procedures; and

  - Descriptions of the actions taken in the event of non-compliances and deficiency reporting and any follow-up procedures related to the earlier non-compliances.

- Summary of Site Audit/ Inspection:

  - Records the dates and time of the site audit/ inspection, and any environmental problems observed;

  - Record the details of personnel involved; and

  - Descriptions of the mitigation measures/ action plans taken if environmental problems are identified during the audit/ inspection.

- Others:

  - An account of the future key issues as reviewed from the works programme and work method statements;

  - Advice on the solid and liquid waste management status; and

  - Comments (e.g. the effectiveness and efficiency of mitigation measures), recommendations (e.g. any improvement in the EM&A programme) and conclusions.

11.2.2 Subsequent Monthly EM&A Reports

11.2.2.1 The subsequent monthly EM&A Reports during the construction phase shall include the following information:

- Executive Summary (1-2 pages):

  - Complaint log;

  - Notifications of any summons and successful prosecutions;

- Reporting changes; and
- Future key issues.

- Basic project information:
  - The project organisation including key personnel contact names and telephone numbers;
  - The construction programme;
  - The management structure; and
  - Works undertaken during the reporting month.

- Environmental status:
  - Advice on the status of statutory environmental compliance, including the status of compliance with the environmental permit (EP) conditions under the EIAO, schedule and progress of any submissions as required under the EP application of Construction Noise Permit (CNP), Waste Water Discharge License in accordance to Water Pollution Control Ordinance (WPCO), C&D Waste Disposal, Chemical Waste Disposal License etc;
  - Works undertaken during the reporting month with illustrations (such as location of works, etc); and
  - Drawing showing the project area, environmental sensitive receivers.

- Implementation status:
  - 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.

- The report on non-compliances, complaints, notifications of summons and status of prosecutions:
  - Records of all complaints received (written or verbal), including the locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
  - Records 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;
  - The review of the reasons for and implications of non-compliances, complaints, summons and prosecutions including review of pollution sources and working procedures; and
  - Descriptions of the actions taken in the event of non-compliance and deficiency reporting and any follow-up procedures related to the earlier non-compliances.

- Summary of Site Audit/ Inspection:
  - Records the dates and time of the site audit/ inspection, and any environmental problems observed;
  - Record the details of personnel involved; and
  - Descriptions of the mitigation measures/ action plans taken if environmental problems are identified during the audit/ inspection.
- Others:
  - An account of the future key issues as reviewed from the works programme and work method statements;
  - Advice on the solid and liquid waste management status;
  - Comments (e.g. the effectiveness and efficiency of the mitigation measures), recommendations (e.g. any improvement in the EM&A programme) and conclusions;
  - Ad-hoc audits carried out.
- Appendices:
  - Cumulative statistics on complaints, notifications of summons and successful prosecutions; and
  - Outstanding issues and deficiencies.

11.2.3 Final EM&A Review Report

11.2.3.1 The EM&A programme shall be terminated upon the completion of the construction activities that have the potential to cause significant environmental impacts.

11.2.3.2 Prior to the proposed termination, it may be advisable to consult the relevant local communities. The proposed termination shall only be implemented after the proposal has been endorsed by the IEC, Engineer/ER and Project Proponent, followed by the approval from the Director of Environmental Protection. The following factors also need to be considered before the termination of the EM&A Programme:

- Completion of construction activities and insignificant environmental impacts of the remaining outstanding construction works; and
- No outstanding environmental complaint and prosecution involved.

11.2.3.3 The ET shall prepare and submit the Final EM&A Report within 14 working days after approval of termination of EM&A programme has been granted. The completion of the construction activities that have the potential to cause significant environmental impacts. The Final EM&A Report shall contain at least the following information:

- Executive summary (1 - 2 pages);
- Drawings showing the project area, environmental sensitive receivers;

- The basic project information including a synopsis of the project organisation, contacts of key management, and a synopsis of works undertaken during the course of the project or past twelve months;

- A brief summary of EM&A requirements including:

  - Environmental mitigation measures implemented as recommended in the EIA Report; and

  - Environmental impact hypotheses tested.

- A summary of the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the EIA Report, summarised in the updated environmental mitigation implementation schedule;

- A summary of the site audit/inspection carried out, including a summary of observations and follow up actions taken;

- A review of the reasons for and implications of non-compliances including the review of pollution sources and working procedures as appropriate;

- A description of the action taken in the event of non-compliances;

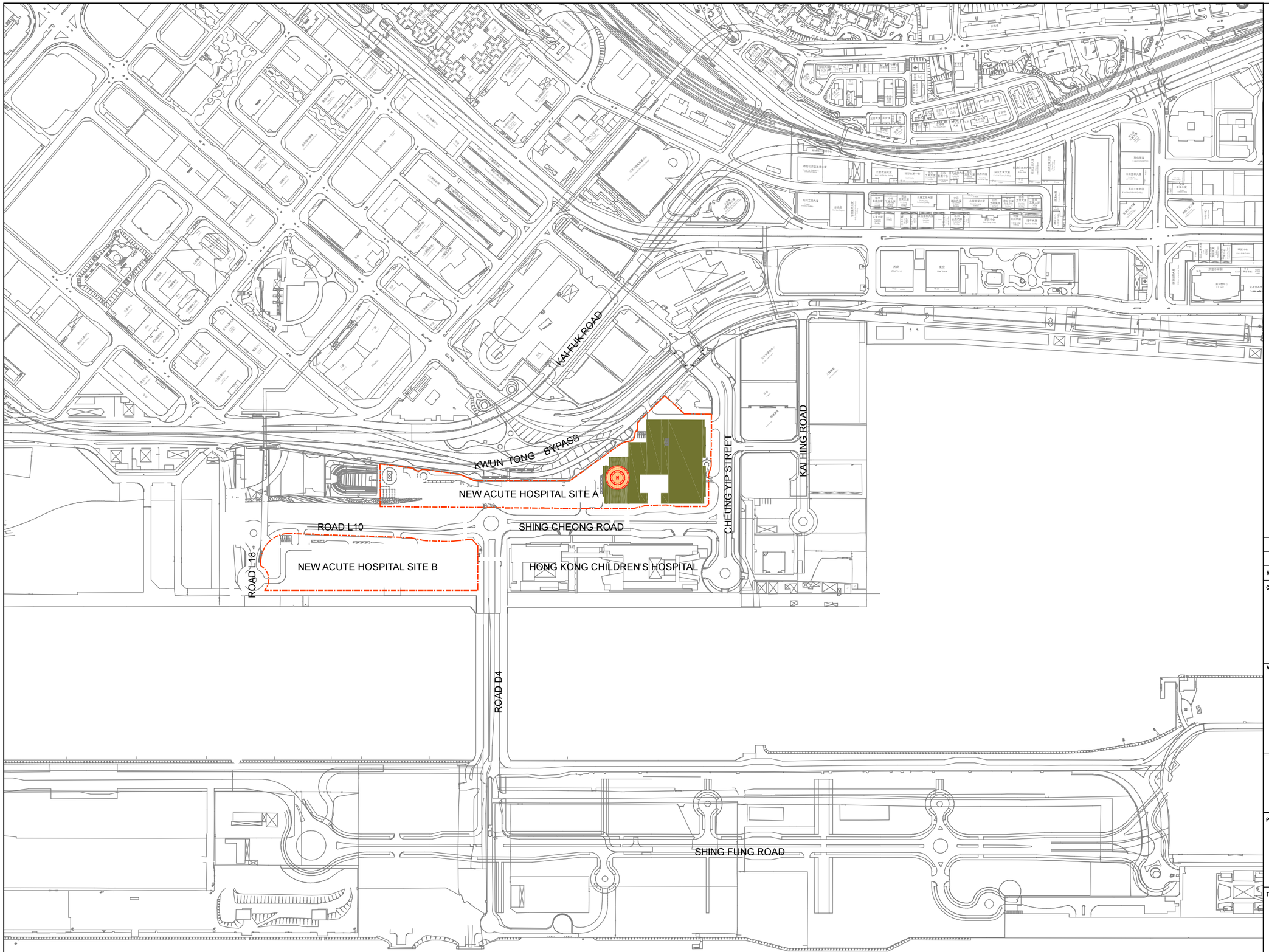
- A summary record of all complaints received (written or verbal), liaison and consultation undertaken, action and follow-up procedures taken;

- A summary record of the notifications of summons and successful prosecutions for breaches of the current environmental protection / pollution control legislation, locations and nature of the breaches, follow-up investigation taken and results;

- Comments (e.g. a review of the effectiveness and efficiency of the mitigation measures and of the performance of the environmental management system, i.e., of the overall EM&A programme); and

- Recommendations and conclusions (e.g. a review of the success of the overall EM&A programme to cost-effectively identify deterioration and to initiate prompt effective mitigation action when necessary).

Figures



BOUNDARY LINE OF NEW ACUTE HOSPITAL AT KAI TAK DEVELOPMENT AREA

PROPOSED ROOFTOP HELIPAD

ACUTE BLOCK

Rev	Amendment	By	Chk.	App.	Date

Client

Architect

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Project

A ROOFTOP HELIPAD AT
NEW ACUTE HOSPITAL AT
KAI TAK DEVELOPMENT AREA

Title

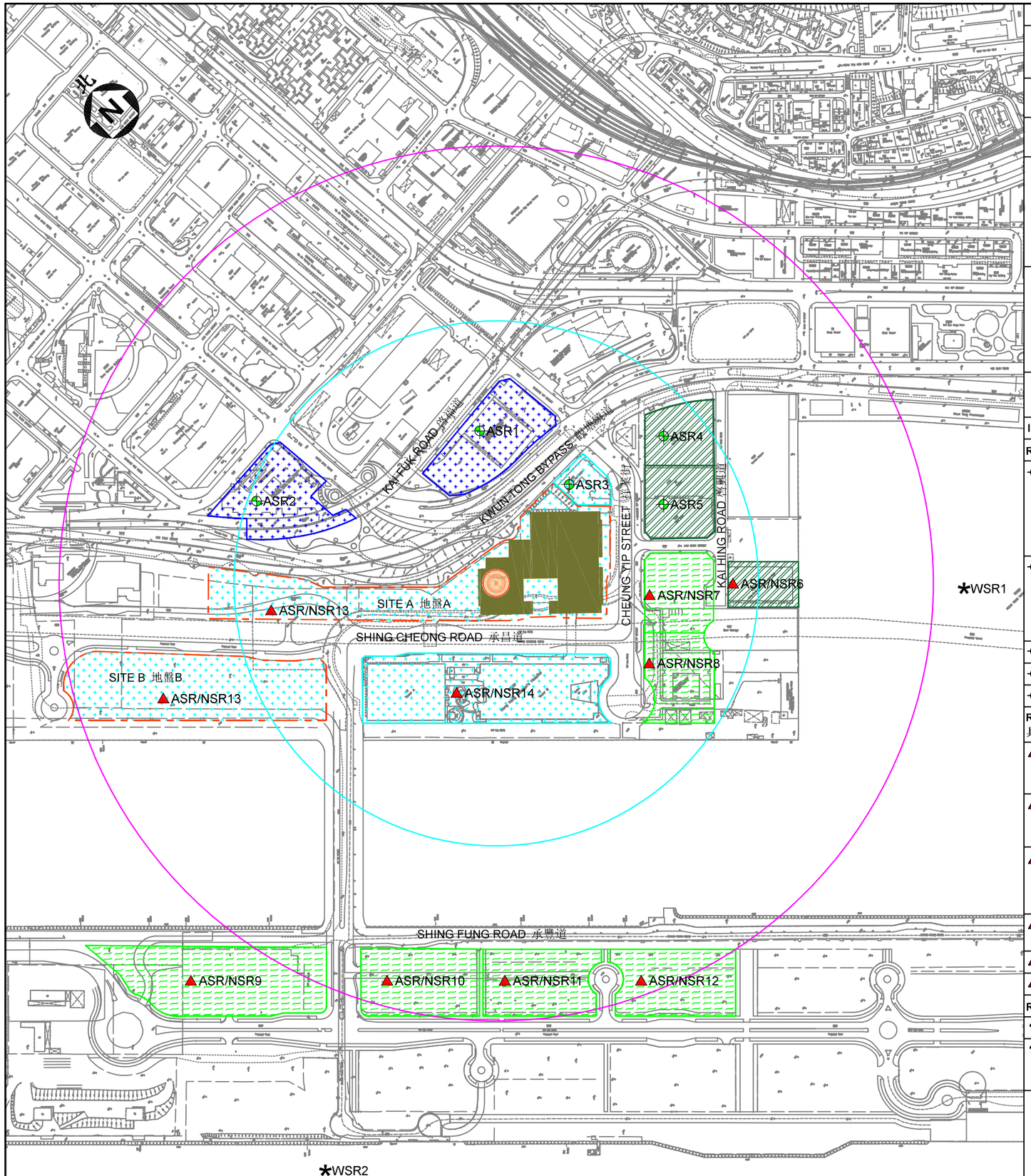
PROJECT LOCATION

Status

Drawn	Checked	Approved
CAD	–	–
Scale	CAD File Name	First Issued
AS SHOWN (A3)		MAY 2019

Drawing No. FIGURE 1.1

Rev. –



LEGEND 圖例

- BOUNDARY LINE OF NEW ACUTE HOSPITAL AT KAI TAK DEVELOPMENT AREA
  啟德發展區新急症醫院地盤邊界
- PROPOSED ROOFTOP HELIPAD
  擬建頂樓直升機停機坪位置
- ACUTE BLOCK
  急症大樓
- LAND USES ACCORDING TO THE APPROVED KAI TAK OUTLINE ZONING PLAN NO. S/K22/6
  按城市規劃委員會已獲核准的啟德分區計劃大綱圖S/K22/6的土地用途
  - RESIDENTIAL 住宅
  - COMMERCIAL 商業
  - GOVERNMENT, INSTITUTION OR COMMUNITY 政府、機構或社區
- LAND USES ACCORDING TO THE APPROVED NGAU TAU KOK AND KOWLOON BAY OUTLINE ZONING PLAN NO. S/K13/29
  按城市規劃委員會已獲核准的牛頭角及九龍灣分區計劃大綱圖S/K13/29的土地用途
  - GOVERNMENT, INSTITUTION OR COMMUNITY 政府、機構或社區
- 300m NOISE ASSESSMENT AREA 300米噪音研究範圍
- 500m AIR ASSESSMENT AREA 500米空氣質素研究範圍

ID 編號	LOCATION 位置
REPRESENTATIVE AIR SENSITIVE RECEIVER 具代表性的空氣敏感受體	
⊕ASR1	TRANSPORT DEPARTMENT NEW KOWLOON BAY VEHICLE EXAMINATION CENTRE (PLANNED COMMERCIAL DEVELOPMENT CUM EFLS DEPOT AND STATION) 運輸署新九龍灣驗車中心 計劃中的商業發展暨環保連接系統車廠及車站)
⊕ASR2	HONG KONG POLICE KOWLOON BAY VEHICLE DETENTION & EXAMINATION CENTRE (PLANNED INTEGRATED WASTE HANDLING FACILITY) 香港警務處九龍灣車輛扣留及驗車中心 (計劃中的綜合廢物處理設施)
⊕ASR3	KAI TAK FIRE STATION 啟德消防局
⊕ASR4	PACIFIC TRADE CENTRE 太平洋貿易中心
⊕ASR5	OCTA TOWER 傲騰廣場
REPRESENTATIVE AIR & NOISE SENSITIVE RECEIVER 具代表性的空氣及噪音敏感受體	
▲ASR/NSR6	PLANNED RESIDENTIAL AREA AT KAI HING STREET (EXISTING KERRY DANGEROUS GOODS WAREHOUSE) 啓興道計劃中的住宅用地(現存嘉里危險品貨倉)
▲ASR/NSR7	PLANNED RESIDENTIAL AREA AT CHEUNG YIP STREET (EXISTING CITYBUS KOWLOON BAY PARKING SITE) 祥業街計劃中的住宅用地(現存城巴九龍灣泊車場)
▲ASR/NSR8	PLANNED RESIDENTIAL AREA AT CHEUNG YIP STREET (EXISTING PUBLIC WORKS CENTRAL LABORATORY BUILDING) 祥業街計劃中的住宅用地(現存工務中央試驗所大樓)
▲ASR/NSR9,10,11,12	PLANNED RESIDENTIAL AREAS AT SHING FUNG ROAD 承豐道計劃中的住宅用地
▲ASR/NSR13	PLANNED NEW ACUTE HOSPITAL 計劃中的新急症醫院
▲ASR/NSR14	HONG KONG CHILDREN'S HOSPITAL 香港兒童醫院
REPRESENTATIVE WATER SENSITIVE RECEIVER 具代表性的水質敏感受體	
✱WSR1	KWUN TONG TYPHOON SHELTER 觀塘避風塘
✱WSR2	SEAWATER INTAKE OF KAI TAK DISTRICT COOLING SYSTEM (SOUTH PLANT) 啟德區域供冷系統海水入口(南座)

Rev	Amendment	By	Chk.	App.	Date

Client
醫院管理局
HOSPITAL AUTHORITY

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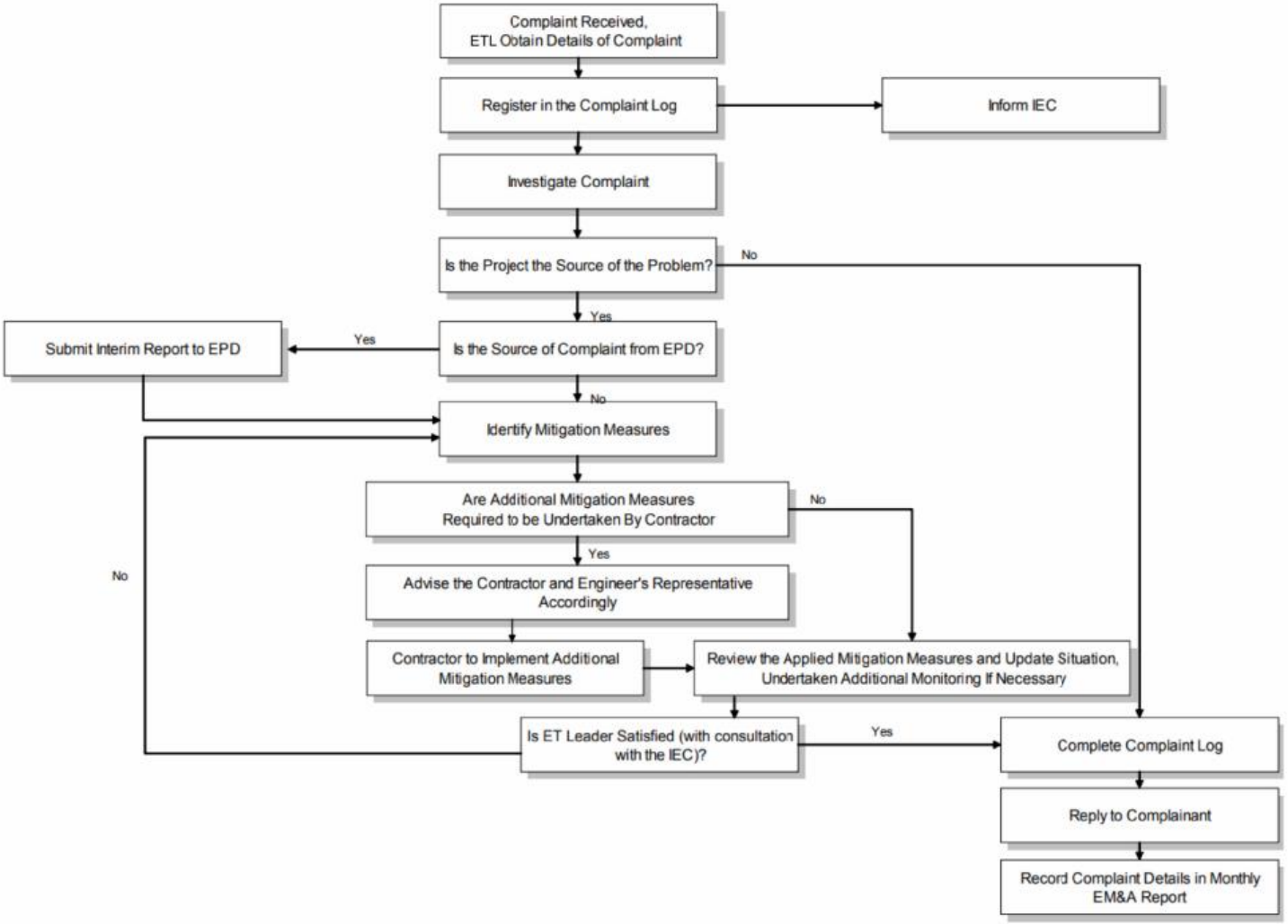
Project
A ROOFTOP HELIPAD AT NEW ACUTE HOSPITAL AT KAI TAK DEVELOPMENT AREA

Title
LOCATION OF AIR, NOISE AND WATER SENSITIVE RECEIVERS

Status

Drawn CAD	Checked –	Approved –	
Scale N.T.S.	CAD File Name	First Issued MAY 2019	
© Copyright Reserved 版權所有 不得翻印	Drawing No. FIGURE 2.1		Rev. –



Rev	Amendment	By	Chk.	App.	Date

Client: 醫院管理局 HOSPITAL AUTHORITY

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Project: A ROOFTOP HELIPAD AT NEW ACUTE HOSPITAL AT KAI TAK DEVELOPMENT AREA

Title: Environmental Complaint Procedure Flow Chart

Status:

Drawn	Checked	Approved
Scale: Not to Scale	CAD File Name	First Issued

Drawing No.: Figure 10.1

Rev.

Appendices

Appendix A
Implementation Schedule for Environmental Mitigation Measures

Appendix A Implementation Schedule for Environmental Mitigation Measures

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages		
							D	C	O
Air Quality									
EIA Section 3.8	EM&A Section 4.2	Adoption of dust control measures recommended in Air Pollution Control Ordinance (Construction Dust) Regulations: a) Heights from which materials are dropped should be restricted as far as practicable to minimise the fugitive dust arising from unloading/loading; b) Use of regular watering to reduce dust emissions from exposed site surfaces, particularly during dry weather.	To minimise dust impacts	All works sites	Contractor and Sub-contractors	EIAO, Air Pollution Control Ordinance		✓	
Hazard to Life									
EIA Section 4.11	EM&A Section 5.2	Professional trainings and guidelines should be provided to the helicopter pilots in order to ensure the pilots be familiar with the procedures	Avoid approaching near the smoke plume in event of a major fire accident at KDGW	-	GFS	-			✓
Noise (Construction Phase)									
EIA Section 5.5.6	EM&A Section 6.2	Good site practices that can further reduce the noise levels at NSRs. These include: • Quiet powered mechanical equipment (QPME) shall be used, and PME shall also be serviced regularly during the construction programme; • Only well maintained plants shall be used in the construction of the Project; and • Machines and plant that may be in intermittent use should be shut down between works periods or throttled down to a minimum between work periods.	To minimise construction noise impact	All works sites	Contractor and Sub-contractors	EIAO, Noise Control Ordinance		✓	

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages		
							D	C	O
EIA Section 5.5.6	EM&A Section 6.2	The "Recommended Pollution Control Clauses for Construction Contracts" published by the EPD should be adopted in the Contract Specification	To minimise construction noise impact	-	Project Proponent	EIAO, Noise Control Ordinance	✓		
Noise (Operation Phase)									
EIA Section 5.6.3	EM&A Section 6.2	GFS Helicopters – to adopt medium-sized single-model helicopter (Airbus H175)	To minimise helicopter noise impact	-	GFS	EIAO			✓
EIA Section 5.6.1	EM&A Section 6.2	Flight Sectors – Helicopter operations are expected to be within the chosen flight sectors, to maintain a buffer distance for flight paths to fly away from NSRs, and in one-way-direction for both arrival and departure	To minimise helicopter noise impact	Refer to Figure 5.2, Figure 5.4a	GFS	EIAO			✓
EIA Section 5.6.5	EM&A Section 6.2	Setback of Helipad – to locate the helipad at the western side of the Acute Block of NAH	To minimise helicopter noise impact	Refer to Figure 5.5	Project Proponent / Contractor and Sub-contractors	EIAO	✓	✓	
EIA Section 5.6.5	EM&A Section 6.2	Installation of noise barrier and noise reducers at the rooftop of Acute Block of the NAH	To minimise helicopter noise impact	Refer to Figure 5.5	Project Proponent / Contractor and Sub-contractors	EIAO	✓	✓	
EIA Section 5.6.5	EM&A Section 6.2	Maintenance of noise barrier and noise reducers at the rooftop of Acute Block of the NAH	To minimise helicopter noise impact	Refer to Figure 5.5	Project Proponent	EIAO			✓
Waste Management									
EIA Section 6.6	EM&A Section 7.2	<u>Good Site Practices</u> a) A trip-ticket system should be established in accordance with DevB TC(W) No. 6/2010 and Waste Disposal (Charges for Disposal of Construction Waste) Regulation to monitor the disposal of inert C&D materials to public fill and solid wastes to landfills, and to control fly-tipping. A trip-ticket system would be included as one of the	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	All works sites	Contractor and Sub-contractors	EIAO, Waste Disposal Ordinance, ETWB TC(W) No. 19/2005, DEVB TC(W) No. 6/2010		✓	

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages		
							D	C	O
		contractual requirements for the Contractor to strictly implement. The Engineer would also regularly audit the effectiveness of the system. b) Proper training shall be provided to workers regarding the appropriate concepts of site cleanliness and waste management procedures, e.g. waste reduction, reuse and recycling all the time. c) The site and surroundings shall be kept tidy and litter free. d) No waste shall be burnt on-site. e) Prohibit to dispose the inert C&D materials at any sensitive locations e.g. natural habitat, etc. f) Recycle as much of the non-inert C&D materials as possible on-site. The non-inert C&D waste should be segregated and stored in separate containers or skips to facilitate the reuse or recycling of materials and proper disposal.							
EIA Section 6.6	EM&A Section 7.2	<u>Waste Reduction Measures</u> a) The waste management hierarchy, which includes the following in descending preference, should be strictly followed: • Avoidance and reduction of waste generation; • Reuse of materials as far as practicable; • Recovery and recycling of	Segregation to minimise waste generation during construction	All works sites	Contractor and Sub-contractors	EIAO, Waste Disposal Ordinance		✓	

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages		
							D	C	O
		residual materials where possible; and • Disposal according to relevant legislations, guidelines and good practices. b) This hierarchy should be adopted to evaluate the waste management options in order to maximise the extent of waste reduction and cost reduction. The records of quantities of waste generated, recycled and disposed (locations) should be properly documented.							
EIA Section 6.6	-	<u>Chemical Wastes</u> a) The Contractor shall register as Chemical Waste Producers with the EPD. Chemical waste should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes as follows: • The containers used for storing chemical waste should be suitable for the substance to be held, resistant to corrosion, maintained in good conditions and securely closed; • The containers should have a capacity of <450L unless the specifications have been approved by the EPD; • The label on the containers should be clearly labelled in English and Chinese and comply with the requirements prescribed in Schedule 2 of Waste Disposal (Chemical Waste)	Control the chemical waste and ensure proper storage, handling and disposal	All works sites	Contractor and Sub-contractors	Waste Disposal ((Chemical Waste)General) Regulation, Code of Practice on the Packaging, Labeling and Storage of Chemical Waste		✓	

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages		
							D	C	O
		(General) Regulation; • The storage area for the chemical waste should be used solely for the storage of chemical wastes; • The storage area should be enclosed on at least three sides by a wall, partition or fence with a height of not less than two metres or the total height of containers in stack, whichever is less; • Where containers of liquid chemical wastes are stored, the area should be designed with impermeable floor and provided with a bund with capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in the area, whichever is greatest; • Adequate ventilation should be allowed in the storage area by leaving some space between the top of the enclosure walls and the ceiling, or provision of louvers on the sides of the enclosure walls; • The storage area should be sufficiently covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and • Separate containers should be used for packing different types of waste or waste arising from different sources and process to minimise mixing of incompatible materials.						

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages		
							D	C	O
		• Drip tray should be provided to chemical waste containers. The drip tray should be clean up regularly. Clean up should be done before foreseeable inclement weather such as typhoon or heavy rain. b) Waste oils, chemicals or solvents shall not be disposed of to drain.							
EIA Section 6.6	EM&A Section 7.2	<u>General Refuse</u> a) General refuse should be stored in enclosed bins or compaction units separately from C&D materials/ wastes and chemical wastes. Sufficient bins shall be provided for storage of general refuse as required under the Public Cleansing and Prevention of Nuisances Regulation. b) General refuse shall be cleared daily and shall be disposed of to the nearest landfill or refuse transfer station. Burning of refuse on construction sites is prohibited. Disposal of general refuse is recommended before foreseeable inclement weather such as typhoon or heavy rain. c) All waste containers shall be in a secure area on hardstanding. d) Segregation and storage of different types of waste should be promoted to facilitate the reuse and recycling of the materials. Separately labelled bins for the deposition of aluminum cans, paper and plastic bottles etc. should be provided as far as practicable.	Minimize production of the general refuse and avoid odour, pest and litter impacts	All works sites	Contractor and Sub-contractors	EIAO, Waste Disposal Ordinance, Cap. 132BK		✓	

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages		
							D	C	O
		Participation in a local collection scheme by the Contractor should be advocated.							
Water Quality (Construction Phase)									
EIA Section 8.7	EM&A Section 9.2	a) All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure their proper and efficient operation at all times particularly following rainstorms; b) Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers; c) Precautions to be taken at any time of the year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted and during or after rainstorms, are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes; d) Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources e.g. generators, equipment maintenance area. Oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental	Good site practice	All works sites	Contractor and Sub-contractors	EIAO, ProPECC PN1/94		✓	

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Objectives of Measures and Main Concern to Address	Location	Implementation Agent	Relevant Standard or Requirement	Implementation Stages		
							D	C	O
		spillage. A bypass should be provided for oil interceptors to prevent flushing during heavy rain; e) The construction solid waste, debris and rubbish on-site should be collected, handled and disposed of properly to avoid causing any water quality impacts; and f) Chemical waste should be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.							
Water Quality (Operational Phase)									
EIA Section 8.7	EM&A Section 9.2	Apply discharge license for the effluent from the foam system of the fire protection system, if required.	Drainage design	All works sites	Project Proponent	EIAO, ProPECC Note PN 5/93, WPCO			✓
Visual (Operational Phase)									
EIA Section 7.6	EM&A Section 8.2	Landing light of the helicopter would be switched on during approach and departure	Control the lighting impacts to the VSRs during operation at nighttime	Helipad	HA/ GFS	-			✓
		Perimeter lights on the helipad will be switched on during approach mode to take-off mode of the helicopter only				-			✓
		perimeter lights will be inset into the helipad emitting upward; and				-			✓
		minimise the external reflectance of the noise barrier material with the use of laminated glass.				-			✓

Appendix B
Site inspection Proforma

SITE INSPECTION PROFORMA **Ref:** _____

Date	Location	Reqt Ref.*	Observation / Deficiency	Mitigation Action** (Responsible Agency)	Date*** of Confirmation

* *EIA Ref / EM&A Log Ref / Design Document Ref / Environmental Protection Contract Clause*
** *Specific Environmental Mitigation Measures should be stated, such as, equipment, processes, systems, practices or technologies*
*** *The required completion date to confirm the specified Environmental Protection Action*

This Proforma is an:
Environmental Protection Instruction for

_____ Date: _____

Signed by Environmental Team Leader

_____ Date: _____

Copy to Independent Environmental Checker (Full Name)

Appendix C
Example of Complaint Log

COMPLAINT LOG **Ref:** _____

Log Ref.	Date / Location	Complainant/ Date of Contract	Details of Complaint	Investigation / Mitigation Action	File Closed

Filed by Environmental Team Leader _____ Date: _____

(Full Name)

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