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30 July 2015

Port Works Division, Civil Engineering Office,  
Civil Engineering and Development Department,

**Environmental Impact Assessment (EIA) Ordinance, Cap.499  
Application for EIA Study Brief**

**Project Title: Lei Yue Mun Waterfront Enhancement Project**  
**(Application No. ESB-287/2015)**

I refer to your above application received on 23 June 2015 for an EIA Study Brief under Section 5(1)(a) of the EIA Ordinance.

In accordance with Section 5(7)(a) of the EIA Ordinance and after public inspection of the project profile, I issue the attached EIA Study Brief (No. ESB-287/2015) for your preparation of an EIA report.

Under Section 15 of the EIA Ordinance, the EIA Study Brief will be placed on the EIA Ordinance Register. It will also be placed on the EIA Ordinance website (<http://www.epd.gov.hk/eia/>).

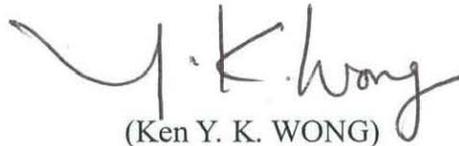
You may submit an application for approval of the EIA report in accordance with Section 6(2) of the EIA Ordinance after its completion. Upon receipt of your application, this department will decide under Section 6(3) of the EIA Ordinance whether the EIA report meets the requirements of the EIA Study Brief and Technical Memorandum on EIA Process, and accordingly advise you under Section 6(4) of the EIA Ordinance whether a submission to the Advisory Council on the Environment (ACE) or its subcommittee is required. In this connection, you are required to provide sufficient copies of the Executive Summary of the EIA report to the Secretariat of the EIA Subcommittee of the Council for selection for submission when you submit the EIA report to this department for approval. Please liaise with Ms. Evelyn LEUNG (Tel: 2594 6323) regarding the details in due course.

If the EIA report is selected by ACE for submission and presentation, you are expected to provide ACE with an account of the environmental issues arising from the project, major conclusions and recommendations of the EIA study. In particular, the main environmental concerns of the general public and interest groups who may be affected by the Project should be identified and addressed in the EIA study. As such, you are strongly advised to engage the public and interest groups during the course of the EIA study. Please find attached a copy of the "*Modus Operandi of the EIA Subcommittee of the Advisory Council on the Environment*" for your reference.

Please note that if you are aggrieved by any of the content of this EIA Study Brief, you may appeal under Section 17 of the EIA Ordinance within 30 days of receipt of this EIA Study Brief.

Should you have any queries on the above application, please contact my colleague Miss Queenie NG at 2835 1129.

Yours sincerely,



(Ken Y. K. WONG)

Principal Environmental Protection Officer  
for Director of Environmental Protection

Encl.

c.c. (w/o encl.)

Secretary of ACE EIA Subcommittee (Attn : Ms. Evelyn LEUNG) Fax: 2872 0603

**Environmental Impact Assessment Ordinance (Cap. 499), Section 5 (7)****Environmental Impact Assessment Study Brief No. ESB-287/2015**

**Project Title: Lei Yue Mun Waterfront Enhancement Project  
(hereinafter known as the "Project")**

**Name of Applicant: Civil Engineering and Development Department  
(hereafter known as the "Applicant")**

**1. BACKGROUND**

- 1.1 An application (No. ESB-287/2015) for an Environmental Impact Assessment (EIA) study brief under section 5(1)(a) of the Environmental Impact Assessment Ordinance (EIAO) was submitted by the Applicant on 23 June 2015 with a project profile (No. PP-525/2015) (the Project Profile).
- 1.2 The Project aims to further improve the facilities along the Lei Yue Mun (LYM) waterfront area in order to capitalize the strengths of LYM and enhance its attractiveness. The Project involves the following works:
- (i) construction of a public landing facility which involves dredging of about 10,000 m<sup>3</sup> of seabed materials to provide sufficient depth of water for vessels, a promenade and a breakwater;
  - (ii) improvement works for five existing lookout points and a viewing platform to enhance their structural capacity;
  - (iii) construction of a carp-shaped platform and a pavilion with children play area;
  - (iv) beautification works for the promenade, lookout points and viewing platform to improve their visual appearance; and
  - (v) streetscape improvement works.

The Project site is located at the waterfront immediately in front of the village houses of the LYM area and at east of the LYM lighthouse. It also lies outside the eastern extent of the Victoria Harbour. The layout plan of the Project is shown in Figure 1 of this EIA Study Brief.

- 1.3 The Project is a designated project by virtue of Item C12(a)(vii) of Schedule 2 of the EIAO : *"A dredging operation exceeding 500,000 m<sup>3</sup> or a dredging operation which is less than 500 m from the nearest boundary of an existing or planned coastal protection area."*
- 1.4 Pursuant to section 5(7)(a) of the EIAO, the Director of Environmental Protection (the Director) issues this EIA study brief to the Applicant to carry out an EIA study.
- 1.5 The purpose of this EIA study is to provide information on the nature and extent of environmental impacts arising from the construction and operation of the Project and associated works that will take place concurrently. This information will contribute to

decisions by the Director on:

- (i) the overall acceptability of any adverse environmental consequences that are likely to arise as a result of the Project and associated works;
- (ii) the conditions and requirements for the detailed design, construction and operation of the Project to mitigate against adverse environmental consequences; and
- (iii) the acceptability of residual impacts after the proposed mitigation measures are implemented.

## **2. OBJECTIVES OF THE EIA STUDY**

2.1 The objectives of the EIA study are as follows:

- (i) to describe the Project and associated works together with the requirements and environmental benefits for carrying out the Project;
- (ii) to identify and describe elements of community and environment likely to be affected by the Project and/or likely to cause adverse impacts to the Project, including natural and man-made environment and the associated environmental constraints;
- (iii) to identify and quantify emission sources, and determine the significance of impacts on sensitive receivers and potential affected uses;
- (iv) to identify and quantify any potential losses or damage to flora, fauna and natural habitats;
- (v) to identify and systematically evaluate any potential landscape and visual impacts and to propose measures to mitigate these impacts;
- (vi) to propose the provision of infrastructure or mitigation measures so as to minimize pollution, environmental disturbance and nuisance during construction and operation of the Project;
- (vii) to investigate the feasibility, practicability, effectiveness and implications of the proposed mitigation measures;
- (viii) to identify, predict and evaluate the residual environmental impacts (i.e. after practicable mitigation) and the cumulative effects expected to arise during the construction and operation phases of the Project in relation to the sensitive receivers and potential affected uses;
- (ix) to identify, assess and specify methods, measures and standards to be included in the detailed design, construction and operation of the Project which are necessary to mitigate these environmental impacts and cumulative effects and reduce them to acceptable levels;
- (x) to investigate the extent of the secondary environmental impacts that may arise from the proposed mitigation measures and to identify constraints associated with the

mitigation measures recommended in the EIA study, as well as the provision of any necessary modification; and

- (xi) to design and specify environmental monitoring and audit requirements to ensure the effective implementation of the recommended environmental protection, mitigation and pollution control measures.

### **3. DETAILED REQUIREMENTS OF THE EIA STUDY**

#### **3.1 The Purpose**

The purpose of this EIA study brief is to scope the key issues of the EIA study and to specify the environmental issues that are required to be reviewed and assessed in the EIA study. The Applicant has to demonstrate in the EIA report whether the criteria in the relevant sections of the Technical Memorandum on the Environmental Impact Assessment Process of the Environmental Impact Assessment Ordinance (hereinafter referred to as “the TM”) are complied with.

#### **3.2 The Scope**

3.2.1 The scope of this EIA study shall cover the Project and associated works mentioned in sub-section 1.2 above. The EIA study shall cover the combined impacts of the whole Project and the cumulative impacts of the existing, committed and planned developments in the vicinity of the Project in accordance with the requirements laid down in section 3.4 of the TM. The environmental impacts of on-site and off-site works and facilities associated with the Project shall be addressed. The EIA study shall address the likely key issues described below, together with any other key issues identified during the course of the EIA study:

- (i) potential air quality impact on air sensitive receivers due to the construction and operation of the Project, including dust, odour, and gaseous emissions;
- (ii) potential noise impact on noise sensitive receivers due to the construction of the Project;
- (iii) potential water quality impact on relevant water system(s) including the Victoria Harbour (Phase One) Water Control Zone, Junk Bay Water Control Zone and Eastern Buffer Water Control Zone, and relevant water sensitive receivers during the construction and operation of the Project, including the impact arising from the marine dredging works and construction of marine structures;
- (iv) potential sewerage and sewage treatment implications arising from the operation of the Project, including the impact due to the increase in sewage generated by the increase in visitors;
- (v) potential land contamination issue arising from the Project;
- (vi) potential waste management implications arising from the construction and operation of the Project, including handling and disposal of construction and demolition materials, dredged marine sediment, chemical waste and general refuse;
- (vii) potential ecological impact during construction and operation of the Project, including

impacts arising from the marine dredging works and land-based construction works;

- (viii) potential fisheries impact during construction and operation of the Project, including impacts arising from the marine dredging works;
- (ix) potential landscape and visual impacts due to the construction and operation of the Project
- (x) potential cumulative environmental impacts of the Project, through interaction or in combination with other existing, committed and planned projects such as the Sewerage to LYM Village, and Construction of Septic Tanks and Dry Weather Flow Interceptors at LYM Waterfront in the vicinity of the Project, and that those impacts may have a bearing on the environmental acceptability of the Project.

### **3.3 Description of the Project**

#### **3.3.1 Purpose(s) and Objectives of the Project**

The Applicant shall provide information on the purpose(s) and objectives of the Project, and describe the benefit of the Project and scenarios with and without the Project.

#### **3.3.2 Details of the Project**

The Applicant shall indicate the nature and status of project decision(s) for which the EIA study is undertaken. The Applicant shall describe the design, size, construction methods, the nature and methods of production or other major activities involved in operation of the project, using diagrams, plans and/or maps as necessary. The estimated duration of the construction phase and operational phase of the Project together with the programme within these phases shall be given. The land taken by the Project site(s), construction sites, and any associated access arrangements, auxiliary facilities and landscaping areas shall be shown on a scaled map. The uses to which the Project will be put shall be described and the different land use areas shall be demarcated as appropriate.

#### **3.3.3 Background and History of the Project**

The Applicant shall provide information on the site location and site history of the Project, any related projects, and the consideration of the different practicable siting and layout options of the proposed landing facility in the context of the Project. The key reasons for selecting the proposed siting and layout of the Project and the part environmental factors played in the selection shall be described. The main environmental impacts of the different practicable siting and layout options shall be compared with those of the Project and with the likely future environmental conditions in the absence of the Project.

### **3.4 Technical Requirements**

- 3.4.1 The Applicant shall conduct the EIA study to address the environmental aspects of the activities as described in section 3.2 above. The assessment shall be based on the best and latest information available during the course of the EIA study. The Applicant shall include in the EIA report details of the construction and operational programme and methodologies for the Project. The Applicant shall clearly state in the EIA report the time frame, staged implementation programme and works programme of the Project and other concurrent

projects, and assess the cumulative environmental impacts from the Project and interacting projects as identified in the EIA study.

3.4.2 The EIA study shall follow the technical requirements specified below and in the Appendices of this EIA study brief.

### 3.4.3 **Air Quality Impact**

3.4.3.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing air quality impact as stated in section 1 of Annex 4 and Annex 12 of the TM respectively.

3.4.3.2 The study area for the air quality impact assessment shall be defined by a distance of 500 metres from the boundary of the Project site, with consideration to be extended to include major existing, planned and committed air pollutant emission sources that may have a bearing on the environmental acceptability of the Project. The assessment shall include the existing, committed and planned sensitive receivers within the study area as well as areas where air quality may be potentially affected by the Project. The sensitive receivers shall include, but not limited to, the existing lookout points and viewing platform, the proposed promenade, pavilion and carp-shaped platform, Tin Hau Temple, Ma Pui Tsuen, Che Ting Tsuen, Ma Wan Tsuen, Lei Yue Mun Basketball Court, Lei Yue Mun Rest Garden, Jockey Club Lei Yue Mun Plus, Former Hoi Bun School Basketball Court and Lei Yue Mun Village. The assessment shall also take into account the impacts of emission sources from nearby concurrent projects, if any. The assessment shall be based on the best available information at the time of the assessment.

3.4.3.3 The assessment of air quality impact arising from the construction and operation of the Project shall follow the detailed technical requirements given in Appendix A. The Applicant shall assess the air pollutant concentrations with reference to the relevant sections of the guidelines given in Appendix A-1 attached to this EIA study brief, or other methodology as agreed by the Director.

### 3.4.4 **Noise Impact (Construction Phase)**

3.4.4.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing noise impact as stated in Annexes 5 and 13 of the TM respectively.

3.4.4.2 The study area for the noise impact assessment shall generally include areas within 300 metres from the boundary of the Project site. Subject to the agreement of the Director, the study area can be reduced accordingly if the first layer of noise sensitive receivers (NSRs), closer than 300 metres from the outer Project limit, provides acoustic shielding to those receivers at distances further away from the Project. The study area shall be expanded to include NSRs at distances over 300 metres from the Project and associated works if those NSRs are also affected by the construction of the Project. The NSRs shall include, but not limited to, Tin Hau Temple, Ma Pui Tsuen, Che Ting Tsuen, Ma Wan Tsuen, Jockey Club Lei Yue Mun Plus and Lei Yue Mun Village.

3.4.4.3 The noise impact assessment shall follow the detailed technical requirements given in Appendix B.

### 3.4.5 **Water Quality Impact**

3.4.5.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing water quality impact as stated in Annexes 6 and 14 of the TM respectively.

3.4.5.2 The study area for the water quality impact assessment shall include areas within 500 metres from the boundary of the Project site and shall cover Victoria Harbour (Phase One) Water Control Zone, Junk Bay Water Control Zone and Eastern Buffer Water Control Zone as designated under Water Pollution Control Ordinance. The study area can be extended to include other areas such as stream courses, existing and new drainage system, and the associated water system(s) in the vicinity if they are found also being affected by the Project during the EIA study and have a bearing on the environmental acceptability of the Project. The assessment shall include the water quality sensitive receivers in the vicinity of the Project, including but not limited to, marine habitats for coral communities, Tung Lung Chau Fish Culture Zone, Secondary Contact Recreation Subzone under the Junk Bay Water Control Zone, potential water sports activities, Water Supplies Department seawater intakes at Yau Tong and the cooling water intake points nearby.

3.4.5.3 The water quality impact assessment shall follow the detailed technical requirements given in Appendix C.

#### 3.4.6 Sewerage and Sewage Treatment Implications

3.4.6.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing impacts on the public sewerage, sewage treatment and disposal facilities as stated in section 6.5 in Annex 14 of the TM.

3.4.6.2 The assessment shall include the sewerage impact arising from the increase in sewage generated by the increase in visitors during operation of the Project, and shall address any possible programme gap between the provision of public sewerage to be implemented under a separate project "Sewerage to LYM Village" undertaken by the Drainage Services Department, and the operation of the Project. Appropriate interim sewage treatment facilities before the public sewerage is provided for the Project shall be examined and recommended in the assessment.

3.4.6.3 The assessment of the sewerage and sewage treatment implication arising from the operation of the Project shall follow the detailed technical requirements given in Appendix D.

#### 3.4.7 Waste Management Implications

3.4.7.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing waste management implications as stated in Annexes 7 and 15 of the TM respectively.

3.4.7.2 The assessment of the waste management implications shall follow the detailed technical requirements given in Appendix E-1.

#### 3.4.8 Land Contamination

3.4.8.1 The Applicant shall follow the guidelines for evaluating and assessing potential land contamination issue as stated in sections 3.1 and 3.2 of Annex 19 of the TM respectively.

3.4.8.2 The assessment of the potential land contamination issue of the Project shall follow the detailed requirements given in Appendix E-2.

### 3.4.9 **Ecological Impact (Terrestrial and Marine)**

3.4.9.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing ecological impact as stated in Annexes 8 and 16 of the TM respectively.

3.4.9.2 The study area for the purpose of the terrestrial and marine ecological impact assessment shall include areas within 500 metres distance from the boundary of the Project site and any other areas likely to be impacted by the Project. The assessment shall include ecological sensitive receivers in the vicinity of the Project, including but not limited to, woodland, grassland, rocky shores, intertidal habitat, subtidal habitat, soft substrate benthic habitat, hard substrate benthic habitat, coral communities and the open water in the vicinity, as well as the rocky outcrop and the oyster shell beach covered under the Coastal Protection Area.

3.4.9.3 The ecological impact assessment shall follow the detailed technical requirements given in Appendix F.

### 3.4.10 **Fisheries Impact**

3.4.10.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing fisheries impact as stated in Annexes 9 and 17 of the TM respectively.

3.4.10.2 The assessment area for the fisheries impact assessment shall include areas within 500 meters distance from the boundaries of the Project and the associated works. The assessment area shall be extended to include any other areas if they are found also being impacted by the Project during the course of the EIA study. Special attention shall be given to any potential loss or disturbance of fishing ground, fisheries habitat, spawning and nursery grounds, water quality deterioration at sensitive receivers particularly the Tung Lung Chau Fish Culture Zone.

3.4.10.3 The fisheries impact assessment shall follow the detailed technical requirements given in Appendix G.

### 3.4.11 **Landscape and Visual Impacts**

3.4.11.1 The Applicant shall follow the criteria and guidelines as stated in Annexes 10 and 18 of the TM respectively, the EIAO Guidance Note No. 8/2010 on "Preparation of Landscape and Visual Impact Assessment under the Environmental Impact Assessment Ordinance" and the report of "Landscape Value Mapping of Hong Kong" for evaluating and assessing the landscape and visual impacts.

3.4.11.2 The study area for the landscape impact assessment shall include areas within 500 metres distance from the boundary of the Project site. The study area for the visual impact assessment shall be defined by the visual envelope of the Project. The assessment shall include, but not limited to, potential landscape impacts on landscape resources (e.g. oyster shell beach and other coastal features, existing trees and slopes, etc.), and potential visual impacts arising from above ground structures (e.g. proposed pavilion and the carp-shaped platform, etc.).

3.4.11.3 The landscape and visual impact assessments shall follow the detailed technical requirements given in Appendix H.

### 3.4.12 Environmental Monitoring and Audit (EM&A) Requirements

3.4.12.1 The Applicant shall identify and justify in the EIA study whether there is any need for EM&A activities during the construction and operation phases of the Project and, if affirmative, to define the scope of EM&A requirements for the Project in the EIA study.

3.4.12.2 Subject to the confirmation of the EIA study findings, the Applicant shall comply with the requirements as stipulated in Annex 21 of the TM.

3.4.12.3 The Applicant shall prepare a Project Implementation Schedule (in the form of a checklist as shown in Appendix I) containing the EIA study recommendations and mitigation measures with reference to the implementation programme.

## 4. DURATION OF VALIDITY

4.1 The Applicant shall notify the Director of the commencement of the EIA study. If the EIA study does not commence within 36 months after the date of issue of the EIA study brief, the Applicant shall apply to the Director for a fresh EIA study brief before commencement of the EIA study.

## 5. REPORT REQUIREMENTS

5.1 In preparing the EIA report, the Applicant shall refer to Annex 11 of the TM for the contents of an EIA report. The Applicant shall also refer to Annex 20 of the TM, which stipulates the guidelines for the review of an EIA report.

5.2 The Applicant shall provide the following summary information in the EIA report :

(i) Summary of Environmental Outcomes

The EIA report shall contain a summary of key environmental outcomes arising from the EIA study, including estimated population protected from various environmental impacts, environmentally sensitive areas protected, environmentally friendly options considered and incorporated in the preferred option, environmental designs recommended, key environmental problems avoided, compensation areas included and the environmental benefits of environmental protection measures recommended.

(ii) Summary of Environmental Impacts

To facilitate effective retrieval of pertinent key information, the EIA report shall contain a summary table of environmental impacts showing the assessment points, results of impact predictions, relevant standards or criteria, extents of exceedances predicted, impact avoidance measures considered, mitigation measures proposed and residual impacts (after mitigation). This summary shall cover each individual impact and shall also form an essential part of the executive summary of the EIA report.

(iii) Documentation of Key Assessment Assumptions, Limitation of Assessment Methodologies and related Prior Agreement(s) with the Director

To facilitate efficient retrieval, the EIA report shall contain a summary including the assessment methodologies and key assessment assumptions adopted in the EIA study, the limitations of these assessment(s) methodologies/assumptions, if any, plus all relevant prior agreement(s) with the Director or other Authorities on individual environmental media assessment components. The proposed use of any alternative assessment tool(s) or assumption(s) have to be justified by the Applicant, with supporting documents based on cogent, scientific and objectively derived reason(s) before seeking the Director's agreement. The supporting documents shall be provided in the EIA report.

(iv) Documentation of Public Concerns

The EIA report shall contain a summary of the main concerns of the general public, special interest groups and the relevant statutory or advisory bodies received and identified by the Applicant during the course of the EIA study, and describe how the relevant concerns have been taken into account.

- 5.3 The Applicant shall supply the Director with hard and electronic copies of the EIA report and the executive summary in accordance with the requirements given in Appendix J of this EIA study brief. The Applicant shall, upon request, make additional copies of the above documents available to the public, subject to payment by the interested parties of full costs of printing.

## **6. OTHER PROCEDURAL REQUIREMENTS**

- 6.1 If there is any change in the name of Applicant for this EIA study brief during the course of the EIA study, the Applicant must notify the Director immediately.
- 6.2 If there is any key change in the scope of the Project mentioned in sub-section 1.2 of this EIA study brief and in Project Profile (No. PP-525/2015), the Applicant must seek confirmation from the Director in writing on whether or not the scope of issues covered by this EIA study brief can still cover the key changes and the additional issues, if any, that the EIA study must also address. If the changes to the Project fundamentally alter the key scope of the EIA study brief, the Applicant shall apply to the Director for a fresh EIA study brief.

## **7. LIST OF FIGURE AND APPENDICES**

- 7.1 This EIA study brief includes the following figure and appendices:

Figure 1 – Project Location Plan

Appendix A – Requirements for Air Quality Impact Assessment

Appendix A-1 – Air Quality Modelling Guidelines

Appendix B – Requirements for Noise Impact Assessment

Appendix C – Requirements for Water Quality Impact Assessment

Appendix C-1 – Hydrodynamic and Water Quality Modelling Requirements

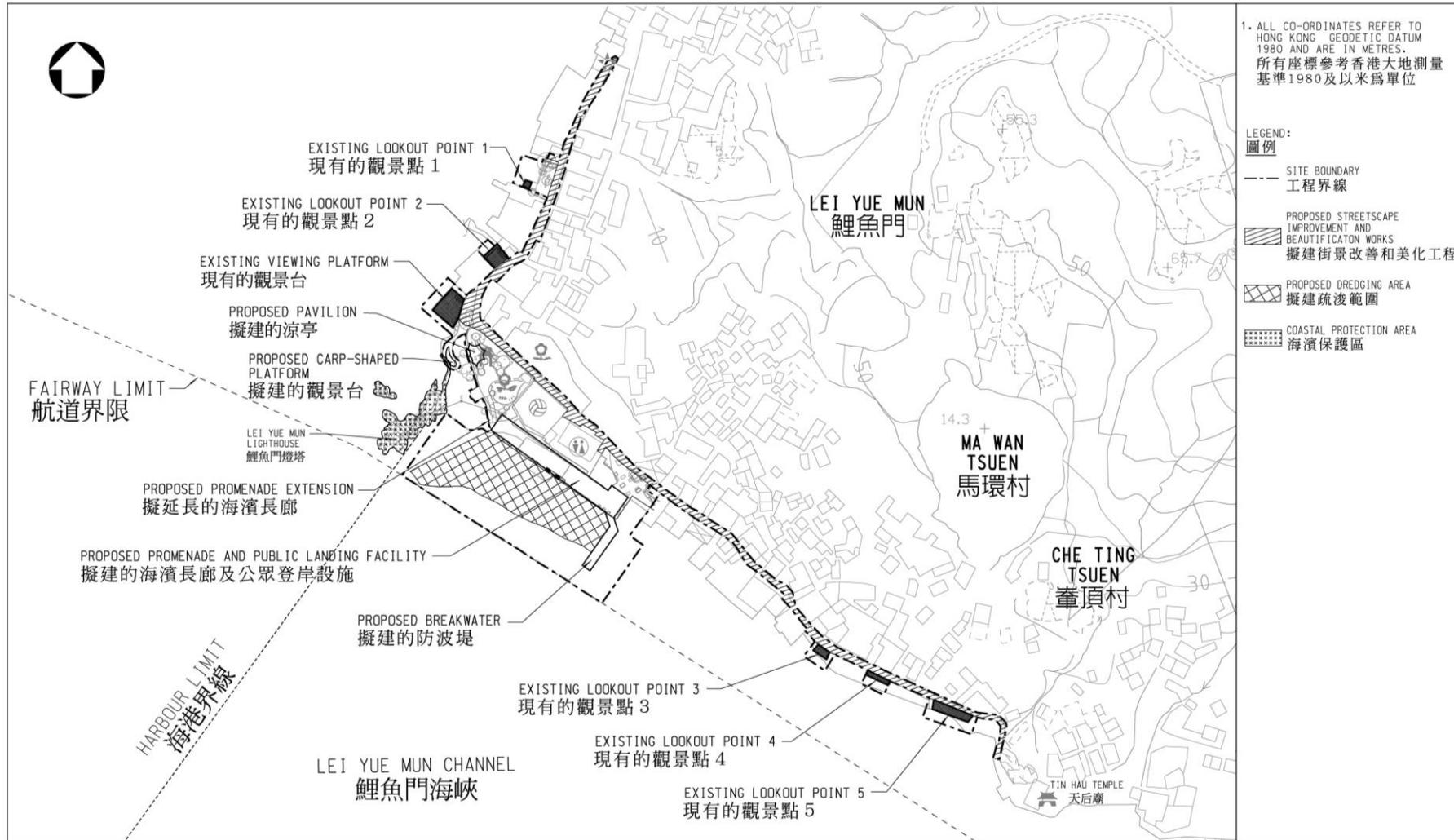
Appendix D – Requirements for Assessment of Sewerage and Sewage Treatment Implications

Appendix E-1 – Requirements for Assessment of Waste Management Implications

Appendix E-2 – Requirements for Land Contamination Assessment  
Appendix F – Requirements for Ecological Impact Assessment  
Appendix G – Requirements for Fisheries Impact Assessment  
Appendix H – Requirements for Landscape and Visual Impact Assessment  
Appendix I – Implementation Schedule  
Appendix J – Requirements for EIA Report Documents

--- END OF EIA STUDY BRIEF ---

July 2015  
Environmental Assessment Division  
Environmental Protection Department



Lei Yue Mun Waterfront Enhancement Project  
 鯉魚門海旁改善計劃  
 EIA Study Brief No. : ESB-287/2015  
 環評研究概要編號：ESB-287/2015  
 This Figure was prepared based on Appendix A of the Project Profile (No.: PP-525/2015)  
 本圖是根據工程項目簡介(編號：PP-525/2015) 附件 1 編制

Figure 1: Project Location Plan  
 附圖 1：工程項目的位置圖

**Appendix A****Requirements for Air Quality Impact Assessment**

The air quality impact assessment shall include the following:

**1. Background and Analysis of Activities**

- (a) Provision of background information relating to air quality issues relevant to the Project, e.g. description of the types of activities of the Project that may affect air quality during construction and operation stages of the Project.
- (b) Provision of an account, where appropriate, of the consideration/measures that have been taken into consideration in the planning of the Project to abate the air pollution impact. The Applicant shall consider alternative construction methods, phasing programmes, and alternative operation modes to minimize the air quality impact during construction and operation stages of the Project.
- (c) Presentation of background air quality levels in the study area for the purpose of evaluating cumulative air quality impacts during construction and operation stages of the Project. If PATH (Pollutants in the Atmosphere and their Transport over Hong Kong) model is used to estimate the background air quality, details for the estimation of the emission sources to be adopted in the model runs should be clearly presented.

**2. Identification of Air Sensitive Receivers (ASRs) and Examination of Emission / Dispersion Characteristics**

- (i) Identification and description of existing, planned and committed ASRs that would likely be affected by the Project, including those earmarked on the relevant Outline Zoning Plans, Development Permission Area Plans, Outline Development Plans and Layout Plans and other relevant published land use plans, including plans and drawings published by Lands Department and any land use and development applications approved by the Town Planning Board. The Applicant shall select the assessment points of the identified ASRs that represent the worst impact point of these ASRs. A map clearly showing the location and description such as name of buildings, their uses and height of the selected assessment points shall be given. The separation distances of these ASRs from the nearest emission sources shall also be given.
- (ii) Provision of a list of air pollution emission sources, including any nearby emission sources which are likely to have impact related to the Project based on the analysis of the constructional and operational activities in section 1 above. Examples of constructional stage emission sources include stock piling, material handling and vehicular movements on unpaved haul roads on site, etc. Examples of operational stage emission sources include emissions from marine traffic induced by the operation of the Project and odour emissions from sewage discharges / interim sewage treatment facilities (if any), etc. Confirmation regarding the validity of the assumptions adopted and the magnitude of the activities (e.g. volume of construction material handled, etc.) shall be obtained from the relevant government departments / authorities and documented in the EIA report.
- (iii) Identification of chimneys and obtainment of relevant chimney emission data in the study

area by carrying out a survey for assessing the potential air quality impact of air pollutants through chimneys. The Applicant shall ensure and confirm that the chimney emission data used in their assessment have been validated and updated by their own survey. If there are any errors subsequently found in their chimney emission data used, the Applicant shall be fully responsible and the submission may be invalidated.

- (iv) Identification of odour emission sources and obtainment of relevant odour emission data in the study area by carrying out a survey for assessing the potential air quality impact of the odour emissions.
- (v) The emissions from any concurrent projects identified as relevant during the course of the EIA study shall be taken into account as contributing towards the overall cumulative air quality impact. The impact as affecting the existing, committed and planned ASRs within the study area shall be assessed, based on the best information available at the time of assessment.

### 3. Construction Phase Air Quality Impact

- (i) The Applicant shall follow the requirements stipulated under the Air Pollution Control (Construction Dust) Regulation to ensure that construction dust impacts are controlled within the relevant standards as stipulated in Section 1 of Annex 4 of the TM.
- (ii) If the Applicant anticipates that the Project will give rise to significant construction dust impacts likely to exceed recommended limits in the TM at the ASRs despite the incorporation of the dust control measures proposed, a quantitative assessment should be carried out to evaluate the construction dust impact at the identified ASRs. The Applicant shall follow the methodology set out in section 5 below when carrying out the quantitative assessment.
- (iii) The Applicant shall examine the likely odour impact that may arise from the construction and associated activities of the Project (e.g. dredging), and propose suitable measures to control/ minimize potential odour nuisance. If the Project will potentially give rise to significant odour impacts likely to exceed recommended limits in the TM at the ASRs, a quantitative assessment should be carried out to evaluate the construction odour impact at the identified ASRs and recommend effective mitigation measures.
- (iv) A monitoring and audit programme for the construction phase of the Project shall be devised to verify the effectiveness of the control measures proposed so as to ensure proper construction dust and odour control.

### 4. Operational Phase Air Quality Impact

- (i) The Applicant shall assess the expected air pollutant impacts at the identified ASRs arising from the operation of the Project (e.g. marine traffic induced by the operation of the Project) based on an assumed reasonably worst-case scenario under normal operating conditions. If the assessment indicates likely exceedances of the recommended limits in the TM at the development and the nearby ASRs, a quantitative assessment should be carried out to evaluate the operational phase air quality impacts at the identified ASRs. The Applicant shall follow the methodology set out in section 5 below when carrying out the quantitative assessment.

- (ii) The Applicant shall assess the potential odour impact at the identified ASRs arising from the Project/activities in the Project during the operation phase based on assumed reasonably worst-case scenario under normal operating conditions.
- (iii) A monitoring and audit programme for the operational phase of the Project shall be devised to verify the effectiveness of the control measures proposed so as to ensure proper control of operational air quality impacts.

## 5. Quantitative Assessment Methodology

If quantitative assessment is required, the Applicant should follow the relevant methodology set out below when carrying out the assessment:

- (i) The Applicant shall conduct the quantitative assessment by applying the general principles enunciated in the modelling guidelines in Appendices A-1 while making allowance for the specific characteristic of the Project. This specific methodology must be documented in such level of details, preferably assisted with tables and diagrams, to allow the readers of the EIA report to grasp how the model has been set up to simulate the situation under study without referring to the model input files. Detailed calculations of air pollutants emission rates for input to the modelling shall be presented in the EIA report. The Applicant must ensure consistency between the text description and the model files at every stage of submissions for review. In case of doubt, the Applicant shall seek prior agreement from the Director on the specific modelling details.
- (ii) The Applicant shall identify the key/representative air pollution parameters (types of pollutants and averaging time concentrations) to be evaluated and provide explanation for selecting such parameters for assessing the impact of the Project. Ozone Limiting Method (OLM) or Discrete Parcel Method (DPM) or other method to be agreed with the Director shall be used to estimate the conversion ratio of  $\text{NO}_x$  to  $\text{NO}_2$  if  $\text{NO}_2$  has been identified as a key air pollutant.
- (iii) For traffic emissions impact assessment, future road traffic shall be calculated based on the highest emission strength from the road within the next 15 years upon commissioning of the proposed development. The Applicant shall demonstrate that the selected year of assessment represents the highest emission scenario given the combination of vehicular emission factors and traffic flow for the selected year. The Applicant shall propose Fleet Average Emission Factors for assessing vehicle emissions. If necessary, the Fleet Average Emission Factors shall be derived by a motor vehicle emission model such as EMFAC-HK model and documented in the EIA report. The Fleet Average Emission Factors used in the assessment shall be agreed with the Director. The traffic flow data and assumptions, such as the exhaust technology fractions, vehicle age/population distribution, traffic forecast and speed fractions, that are used in the assessment shall be presented in the form of both summary table(s) and graph(s).
- (iv) If vehicle tunnels and/or full enclosures are proposed in the Project, it is the responsibility of the Applicant to ensure that the air quality inside these proposed structures shall comply with EPD's "Practice Note on Control of Air Pollution in Vehicle Tunnels". When assessing air quality impact due to emissions from tunnels/full enclosures, the Applicant shall ensure prior agreement with the relevant ventilation design engineer over the amount and the types/kinds of pollutants emitted from these

full enclosures; and such assumptions shall be clearly and properly documented in the EIA report.

- (v) The Applicant shall calculate the overall cumulative air quality impact at the ASRs identified under section 2 above and compare these results against the criteria set out in Section 1 of Annex 4 in the TM. The predicted air quality impacts (both unmitigated and mitigated) shall be presented in the form of summary table(s) and pollution contours, to be evaluated against the relevant air quality standards and on any effect they may have on the land use implications. Plans of a suitable scale should be used to present pollution contours to allow buffer distance requirements to be determined properly.
- (vi) If there are any direct technical noise remedies recommended in the study, the air quality implication due to these technical remedies shall be assessed. For instance, if barriers that may affect dispersion of air pollutants are proposed, then the implications of such remedies on air quality impact shall be assessed. The Applicant shall highlight clearly the locations and types of agreed noise mitigating measures (where applicable), be they noise barriers and affected ASRs, on contour maps for easy reference.

#### 6. Mitigation Measures for Non-compliance

The Applicant shall propose remedies and mitigating measures where the predicted air quality impact exceeds the criteria set in Section 1 of Annex 4 in the TM. These measures and any constraints on future land use planning shall be agreed with the relevant government departments/authorities and documented. The Applicant shall demonstrate quantitatively that the residual impacts after incorporation of the proposed mitigating measures will comply with the criteria stipulated in Section 1 of Annex 4 in the TM.

#### 7. Submission of Model Files

Input and output file(s) of model run(s) including those files for generating the pollution contours and emission calculation work sheets shall be submitted to the Director in electronic format together with the submission of the EIA report.

**Appendix A-1****Air Quality Modelling Guidelines**

*[The information contained in this Appendix is meant to assist the Applicant in performing the air quality assessment. The Applicant must exercise professional judgement in applying this general information.]*

The air quality modelling guidelines shall include the following guidelines as published on the website of the Environmental Protection Department ([http://www.epd.gov.hk/epd/english/environmentinhk/air/guide\\_ref/guide\\_aqa\\_model.html](http://www.epd.gov.hk/epd/english/environmentinhk/air/guide_ref/guide_aqa_model.html)):

- i) Guidelines on Choice of Models and Model Parameters;
- ii) Guidelines on Assessing the "Total" Air Quality Impact (Revised);
- iii) Guidelines on the Use of Alternative Computer Models in Air Quality Assessment (Revised);
- iv) Guidelines on the Estimation of PM<sub>2.5</sub> for Air Quality Assessment in Hong Kong; and
- v) Guidelines on the Estimation of 10-minute Average SO<sub>2</sub> Concentration for Air Quality Assessment in Hong Kong.

**Appendix B****Requirements for Noise Impact Assessment**

The noise impact assessment shall include the following:

**1. Description of the Noise Environment**

The Applicant shall describe the prevailing noise environment in the EIA report.

**2. Construction Noise Impact Assessment****2.1 Construction Noise Impact Assessment Methodology**

2.1.1 The Applicant shall carry out construction noise impact assessment (excluding percussive piling) of the Project during daytime, i.e. 7am to 7pm, on weekdays other than general holidays in accordance with methodology in paragraphs 5.3 and 5.4 of Annex 13 of the TM.

**2.2 Identification of Construction Noise Impact****2.2.1 Identification of Assessment Area and Noise Sensitive Receivers**

- (a) The Applicant shall propose the assessment area for agreement of the Director before commencing the assessment. The assessment area for the construction noise impact assessment shall generally include areas within 300 metres from the boundary of the Project and the works of the Project.
- (b) The Applicant shall identify all existing, committed and planned NSRs in the assessment area and select assessment points to represent identified NSRs for carrying out quantitative construction noise impact assessment described below.
- (c) The assessment points shall be confirmed with the Director prior to the commencement of the quantitative construction noise impact assessment and may be varied subject to the best and latest information available during the course of the EIA study.
- (d) A map showing the location and description such as name of building, use, and floor of each and every selected assessment point shall be given. Photographs of existing NSRs shall be appended to the EIA report.

**2.2.2 Inventory of Noise Sources**

The Applicant shall identify and quantify an inventory of noise sources for representative construction equipment for the purpose of construction noise impact assessment.

**2.3 Prediction and Evaluation of Construction Noise Impact****2.3.1 Phases of Construction**

The Applicant shall identify representative phases of construction that would have noticeable varying construction noise emissions at existing NSRs at the assessment area for agreement of the Director before commencing the construction noise impact assessment.

### 2.3.2 Scenarios

The Applicant shall quantitatively assess the construction noise impact, with respect to criteria set in Annex 5 of the TM, of unmitigated scenario and mitigated scenario at different phases of construction of the Project.

### 2.3.3 Prediction of Noise Impact

- (a) The Applicant shall present the predicted noise levels in Leq (30 min) dB(A) at the selected assessment points on tables and plans of suitable scale.
- (b) The assessment shall cover the cumulative construction noise impact resulting from the construction works of the Project and other concurrent projects identified during the course of the EIA study on existing NSRs within the assessment area.
- (c) The Applicant shall, as far as practicable, formulate a reasonable construction programme so that no work will be required in restricted hours as defined under the Noise Control Ordinance (NCO). In case the Applicant needs to evaluate whether construction works in restricted hours as defined under the NCO are feasible or not in the context of programming construction works, reference should be made to relevant technical memoranda issued under the NCO. Regardless of the results of construction noise impact assessment for restricted hours, the Noise Control Authority will process Construction Noise Permit (CNP) application, if necessary, based on the NCO, the relevant technical memoranda issued under the NCO, and the contemporary conditions/situations. This aspect should be explicitly stated in the noise chapter and the conclusions and recommendations chapter in EIA report.

## 2.4 Mitigation of Construction Noise Impact

### 2.4.1 Direct Mitigation Measures

Where the predicted construction noise impact exceeds the criteria set in Table 1B of Annex 5, TM, the Applicant shall consider and evaluate direct mitigation measures including but not limited to, movable barriers, enclosures, quieter alternative methods, re-scheduling, restricting hours of operation of noisy tasks, etc. The feasibility, practicability, programming and effectiveness of the recommended mitigation measures shall be assessed. Any direct mitigation measures recommended should be well documented in the report. Specific reasons for not adopting certain direct mitigation measures to reduce the noise to a level meeting the criteria in the TM or to maximize the protection for the NSRs as far as possible should be clearly substantiated and documented in the EIA report. If the mitigated noise levels still exceed the relevant criteria, the duration of the noise exceedance shall be given.

**Appendix C****Requirements for Water Quality Impact Assessment**

1. The Applicant shall identify and analyse physical, chemical and biological disruptions of the water system(s) arising from the construction and operation of the Project.
2. The Applicant shall predict, quantify and assess any water quality impacts arising from the construction and operation of the Project by appropriate mathematical modelling and/or other techniques proposed by the Applicant and approved by the Director. The mathematical modelling requirements are set out in Appendix C-1. Possible impacts due to the dredging, transportation and disposal of dredged materials, other marine works activities, effluent discharge shall include changes in hydrology, flow regime, sediment erosion and deposition patterns, morphological change of seabed profile, water quality and sediment quality. The prediction shall include possible different construction stages or sequences of the Project. Affected sensitive receivers shall be identified by the assessment tool with indications of degree of severity.
3. The assessment shall include, but not be limited to the following:
  - (i) the water quality impacts of the site run-off generated during the construction stage such as the effluents generated from dewatering associated with piling activities, grouting and concrete washing and those specified in the ProPECC Practice Note 1/94;
  - (ii) the water quality impacts on designated area for secondary contact recreation, corals, potential water sports activities, beaches, seawater intake points, river courses and drainages around the work sites; and
  - (iii) the water quality impact arising from marine dredging works and sand filling activities during construction, and water quality impact arising from vessels berthing and visitor patronage during operation.
4. The Applicant shall address water quality impacts due to the construction phase and operational phase of the Project. Essentially, the assessment shall address the following :
  - (i) collect and review background information on affected existing and planned water systems, their respective catchments and sensitive receivers which might be affected by the Project;
  - (ii) characterize water quality of the water systems and sensitive receivers, which might be affected by the Project based on existing best available information or through appropriate site survey and tests;
  - (iii) identify and analyse relevant existing and planned future activities, beneficial uses and water sensitive receivers related to the affected water system(s). The Applicant should refer to, *inter alia*, those developments and uses earmarked on the relevant Outline Zoning Plans, Development Permission Area Plans, Outline Development Plans and Layout Plans, and any other relevant published landuse plans;

- (iv) identify pertinent water quality objectives and establish other appropriate water quality criteria or standards for the water system(s) and the sensitive receivers identified in (i), (ii) & (iii) above;
- (v) review the specific construction methods and configurations, and operation of the Project to identify and predict the likely water quality impacts arising from the Project;
- (vi) identify any alternation of any water courses, natural streams, ponds, change of water holding/flow regimes of water bodies, change of catchment types or areas, erosion or sedimentation due to the Project and any other hydrological changes in the study area;
- (vii) identify and quantify existing and likely future water pollution sources, including point discharges and non-point sources to surface water runoff, sewage from workforce and polluted discharge generated from the Project, contaminant release from works on marine sediment and sediment release or re-suspension from works into water bodies;
- (viii) provide an emission inventory on the quantities and characteristics of those existing and future pollution sources in the study area. Field investigation and laboratory test, shall be conducted as appropriate to fill relevant information gaps;
- (ix) report the adequacy of the existing sewerage and sewage treatment facilities for the handling, treatment and disposal of wastewater arising from the Project as required in section 3.4.6;
- (x) identify and quantify the water quality impacts based on the findings and recommendations from the Sewerage and Sewage Treatment Implications Assessment under section 3.4.6. The water quality concerns shall include, but not limited to, possible sewage overflow or emergency discharge due to capacity constraints of the sewerage system, and emergencies arising from the Project;
- (xi) predict and quantify the impacts on the water system(s) include change in hydrology, flow regime, water quality and the effects on the sensitive receivers brought about by those alternations and changes identified in (vi) to (x) above. The prediction shall take into account and include possible different construction and operation stages of the Project;
- (xii) assess the cumulative impacts due to other related concurrent and planned projects, activities or pollution sources within the study area that may have a bearing on the environmental acceptability of the Project;
- (xiii) analyze the provision and adequacy of existing and planned future facilities to reduce pollution arising from the point and non-point sources identified in (vii) above;

- (xiv) develop effective infrastructure upgrading or provision, contingency plan, water pollution prevention and mitigation measures to be implemented during construction and operation stages, including emergency sewage discharge in the case of sewage treatment works and sewage pumping stations, so as to reduce the water quality impacts to within standards. Requirements to be incorporated in the Project contract document shall also be proposed;
- (xv) investigate and develop best management practices to reduce storm water and non-point source pollution as appropriate; and
- (xvi) evaluate and quantify residual impacts on water system(s) and the sensitive receivers with regard to the appropriate water quality objectives, criteria, standards or guidelines.

**Appendix C-1****Hydrodynamic and Water Quality Modelling Requirements****Modelling Software General**

1. The modelling software shall be fully 3-dimensional capable of accurately simulating the stratified condition, salinity transport, and effects of wind and tide on the water body within the model area.
2. The modelling software shall consist of hydrodynamic, water quality, sediment transport and particle dispersion modules. All modules shall have been proven with successful applications locally and overseas.
3. The hydrodynamic, water quality and sediment transport shall be strictly mass conserved at all levels.
4. An initial dilution model shall be used to characterize the initial mixing of the effluent discharge, and to feed the terminal level and size of the plume into the far field water quality modules where necessary. The initial dilution model shall have been proven with successful applications locally and overseas.

**Model Details – Calibration and Validation**

1. The models shall be properly calibrated and validated against applicable existing and/or newly collected field data before their use in this study in the Hong Kong waters, the Pearl Estuary and the Dangan (Lema) Channel. The field data set for calibration and validation shall be agreed with EPD.
2. Tidal data shall be calibrated and validated in both frequency and time domain manner.
3. For the purpose of calibration and validation, the model shall run for not less than 15 days of real sequence of tide (excluding model spin up) in both dry and wet seasons with due consideration of the time required to establish initial conditions.
4. In general the hydrodynamic models shall be calibrated to the following criteria:

<u>Criteria</u>	<u>Level of fitness with field data</u>
• tidal elevation (@)	< 8 %
• maximum phase error at high water and low water	< 20 minutes
• maximum current speed deviation	< 30 %
• maximum phase error at peak speed	< 20 minutes
• maximum direction error at peak speed	< 15 degrees
• maximum salinity deviation	< 2.5 ppt
@ Root mean square of the error including the mean and fluctuating components shall meet the criteria at no less than 80% of the monitoring stations in the model domain	

5. The consultants shall be responsible for acquiring/developing and calibration of the models for use in this study themselves. They may make reference to the models developed under the Update on Cumulative Water Quality and Hydrological Effect of Coastal Developments

and Upgrading of Assessment Tool (Agreement No. CE 42/97). They may also propose to use other models subject to agreement with EPD.

### Model Details – Simulation

1. The water quality modelling results shall be qualitatively explainable, and any identifiable trend and variations in water quality shall be reproduced by the model. The water quality model shall be able to simulate and take account of the interaction of dissolved oxygen, phytoplankton, organic and inorganic nitrogen, phosphorus, silicate, BOD, temperature, suspended solids, contaminants release of dredged and disposed material, air-water exchange, *E. coli* and benthic processes. It shall also simulate salinity. Salinity results simulated by hydrodynamic models and water quality models shall be demonstrated to be consistent.
2. The sediment transport module for assessing impacts of sediment loss due to marine works shall include the processes of settling, deposition and re-erosion. The values of the modelling parameters shall be agreed with EPD. Contaminants release and DO depletion during dredging and dumping shall be simulated by the model.
3. The models shall at least cover the Hong Kong waters, the Pearl Estuary and the Dangan Channel to incorporate all major influences on hydrodynamic and water quality. A fine grid model may be used for detailed assessment of this study. It shall either be linked to a far field model or form part of a larger model by gradual grid refinement. The coverage of the fine grid model shall be properly designed such that it is remote enough so that the boundary conditions will not be affected by the project. The model coverage area shall be agreed with EPD.
4. In general, grid size at the area affected by the project shall be less than 400 m in open waters and less than 75 m around sensitive receivers. The grid shall also be able to reasonably represent coastal features existing and proposed in the project. The grid schematization shall be agreed with EPD.

### Modelling Assessment

1. The assessment shall include the construction and operational phases of the project. Where appropriate, the assessment shall also include maintenance dredging. Scenarios to be assessed shall cover the baseline condition and scenarios with various different options proposed by the Applicant in order to quantify the environmental impacts and improvements that will be brought about by these options. Corresponding pollution load, bathymetry and coastline shall be adopted in the model set up.
2. Hydrodynamic, water quality, sediment transport modules, where appropriate, shall be run for (with proper model spin up) at least a real sequence of 15 days spring-neap tidal cycle in both the dry season and the wet season.
3. For assessing temporary discharges via emergency outfalls, the Applicant shall estimate discharge loading, pattern and duration. The worst case scenario shall include discharge near slack water of neap tide. A period of at least 15 days spring-neap cycle in wet season, but long enough for recovery of the receiving water, shall be simulated. Detailed methodology shall be agreed with EPD.
4. The results shall be assessed for compliance of Water Quality Objectives. Any changes in

hydrodynamic regime shall be assessed. Daily erosion / sedimentation rate shall be computed and its ecological impact shall be assessed.

5. The impact on all sensitive receivers shall be assessed.
6. Cumulative impacts due to other projects, activities or pollution sources within a boundary to the agreement of EPD shall also be predicted and quantified.

**Appendix D****Requirements for Assessment of Sewerage and Sewage Treatment Implications**

1. The Applicant shall investigate and determine the need and the feasibility of having central pre-treatment facilities and/or a separate sewage treatment plant for the Project. Taking into consideration any programme gap between provision of public sewerage and the operation of the Project, the Applicant shall also investigate and determine the need and feasibility of providing interim sewage treatment facilities.
2. The Applicant shall study and assess the need and impacts of discharging sewage to the existing/planned sewerage systems in the Lei Yue Mun area. The assessment shall include the following:
  - (i) review and confirm whether the existing, committed, planned sewerage systems and sewage treatment works in the Lei Yue Mun area will provide adequate capacity for the Project. The Applicant shall quantitatively address the impacts of the maximum estimated flows on the sewerage systems. The appropriate treatment level of interim discharge, if required, shall be assessed. The water quality impacts arising from the interim and ultimate effluent discharge, if any, shall be assessed;
  - (ii) employ the latest version of the computer model “InfoWorks” or equivalent computer models to assess impacts of the Project on the existing and planned sewerage network in Lei Yue Mun area;
  - (iii) propose and undertake all required measures to mitigate any forecast shortfalls in the sewerage system as a result of the Project and demonstrate the proposed measures would be adequate for the maximum estimated flows. Any proposed sewerage system and/or on-site sewage treatment facility should be designed to meet the current government standards and requirements;
  - (iv) identify and quantify the water quality and ecological impacts due to the emergency discharge from on-site sewage treatment plant/pumping stations, if any, and sewer bursting discharge, and to propose measures to mitigate these impacts;
  - (v) identify the appropriate alignment and layouts of the new sewerage to connect to the existing/planned/future sewerage systems in the Lei Yue Mun area and investigate and assess the technical feasibility of connection (eg. technical feasibility and details for connection to public sewer and sewage pumping station); and
  - (vi) set out the design, operation and maintenance requirements and identify the party responsible for the construction and maintenance of any proposed sewerage and sewage treatment facilities, such as pumping station(s) and sewage treatment plant, including electrical and mechanical components to eliminate the problem of septicity incurred in long rising main(s) during low flows and to facilitate maintenance. The above shall be agreed by DSD and EPD (Twin rising mains for each pumping station should be provided to make sure that the proposed sewage rising mains are maintainable without shutting down and discharging untreated sewage into the natural stream/drainage channel directly).

**Appendix E-1****Requirements for Assessment of Waste Management Implications**

The assessment of waste management implications shall cover the following:

**1. Analysis of Activities and Waste Generation**

- (i) The Applicant shall identify the quantity, quality and timing of the waste arising as a result of the construction and operation activities of the Project, based on the sequence and duration of these activities, e.g. any dredged/excavated sediment/mud, construction and demolition (C&D) materials and other wastes which would be generated during construction and operational stages.
- (ii) The Applicant shall adopt appropriate design, general layout, construction methods and programme to minimize the generation of public fill/inert C&D materials and maximize the use of public fill/inert C&D materials for other construction works.
- (iii) The Applicant shall consider alternative project designs/ measures to avoid/ minimize floating refuse accumulation/ entrapment and measures/ proposals for the potential floating refuse problem, e.g. regular collection of the floating refuse along the shoreline. Regarding the potential trapping of floating refuse along the shoreline of the Project, the Applicant shall estimate the amount of floating refuse to be found/trapped along the shoreline of the Project in construction stage and after the completion of the Project (if any). The Applicant shall develop an effective plan / design to avoid/ minimize the trapping of floating refuse. If floating refuse problem is identified and needs to be dealt with, the Applicant shall propose appropriate measures to deal with this floating refuse in a proper and acceptable manner e.g. to collect, recycle, reuse, store, transport and dispose of.

**2. Proposal for Waste Management**

- (i) Prior to considering the disposal options for various types of wastes, opportunities for reducing waste generation, on-site or off-site re-use and recycling shall be fully evaluated. Measures which can be taken in planning and design stages e.g. by modifying the design approach and in the construction stage for maximizing waste reduction shall be separately considered.
- (ii) After considering the opportunities for reducing waste generation and maximizing re-use, the types and quantities of the wastes required to be disposed of as a consequence shall be estimated and the disposal methods/options for each type of wastes shall be described in detail. The disposal methods/options recommended for each type of wastes shall take into account of the result of the assessment in (iv) below.
- (iii) The EIA report shall also state clearly the transportation routings and the frequency of the trucks/vessels involved, any barging point or conveyor system to be used, the stockpiling areas and the disposal outlets for the waste identified.
- (iv) The impact caused by handling (including stockpiling, labelling, packaging and storage), collection, transportation and re-use/disposal of wastes shall be addressed in

detail and appropriate mitigation measures shall be proposed. This assessment shall cover the following areas :

- air and odour emissions;
- noise; and
- wastewater discharge.

### 3. Excavation/Dredging and Dumping

- (i) The Applicant shall identify and estimate excavation/dredging, excavated/dredged sediment/mud transportation and disposal activities and requirements. Potential dumping ground to be involved shall also be identified. Appropriate field investigation, sampling and chemical and biological laboratory tests to characterize the sediment/mud concerned shall be conducted. The ranges of parameters to be analyzed; the number, type and methods of sampling; sample preservation; chemical and biological laboratory test methods to be used shall be agreed with the Director (with reference to Section 4.4.2(c) of the TM) prior to the commencement of the tests and documented in the EIA report for consideration. The categories of sediment/mud which are to be disposed of in accordance with a permit granted under the Dumping at Sea Ordinance (DASO) shall be identified by both chemical and biological tests and their quantities shall be estimated. If the presence of any serious contamination of sediment/mud which requires special treatment/disposal is confirmed, the Applicant shall identify the most appropriate treatment and/or disposal arrangement and demonstrate its feasibility. The Applicant shall provide supporting document, such as agreement by the relevant facilities management authorities, to demonstrate the viability of any treatment/disposal plan.
- (ii) The Applicant shall identify and evaluate the best practicable excavation/dredging methods to minimize dredging/excavation and dumping requirements based on the criterion that existing sediment/mud shall be left in place and not to be disturbed as far as possible.

**Appendix E-2****Requirements for Land Contamination Assessment**

If any contaminated land uses as stated in Sections 3.1 and 3.2 of Annex 19 in the TM is identified, the Applicant shall carry out the land contamination assessment as detailed in sub-sections (i) to (vi) below and propose measures to avoid disposal:

- (i) The Applicant shall follow the guidelines for evaluating and assessing potential land contamination issues as stated in Sections 3.1 and 3.2 of Annex 19 of the TM, respectively.
- (ii) The Applicant shall provide a clear and detailed account of the present land use (including description of the activities, chemicals and hazardous substances handled, with clear indication of their storage and location, by reference to a site layout plan) and a complete past land uses history, in chronological order, in relation to possible land contamination (including accident records and change of land use(s) and the like).
- (iii) The Applicant shall identify the potential land contamination site(s) within the boundary of the Project site (Figure 1 refers) and, if any, within the boundaries of all associated areas (e.g. work areas) of the Project.
- (iv) During the course of the EIA study, the Applicant shall submit a Contamination Assessment Plan (CAP) to the Director for endorsement prior to conducting an actual contamination impact assessment of the land or site(s) as identified in (iii) above. The CAP shall include a proposal with details on representative sampling and analysis required to determine the nature and the extent of the contamination of the land or site(s). Alternatively, the Applicant may refer to other previously agreed and still relevant and valid CAP(s) for the concerned site(s).
- (v) Based on the endorsed CAP, the Applicant shall conduct a land contamination impact assessment and submit a Contamination Assessment Report (CAR) to the Director for endorsement. If land contamination is confirmed, a Remedial Action Plan (RAP) to formulate viable remedial measures with supporting documents, such as agreement by the relevant facilities management authorities, shall be submitted to the Director for endorsement. The Applicant shall then clean up the contaminated land or site(s) according to the endorsed RAP, and a Remediation Report (RR) to demonstrate adequate clean-up should be prepared and submitted to the Director for endorsement prior to the commencement of any development or redevelopment works within the boundary of the Project site (Figure 1 refers). The CAP, CAR and RAP shall be documented in the EIA report.
- (vi) If there are potential contaminated sites which are inaccessible for conducting sampling and analysis during the course of the EIA study, e.g. due to site access problem, the Applicant's CAP shall include :
  - (a) a review of the available and relevant information;
  - (b) an initial contamination evaluation of these sites and possible remediation methods;
  - (c) a confirmation of whether the contamination problem at these sites would be

surmountable;

- (d) a sampling and analysis proposal which shall aim at determining the nature and the extent of the contamination of these sites ; and
- (e) where appropriate, a schedule of submission of revised or supplementary CAP, CAR, RAP and RR as soon as these sites become accessible.

**Appendix F****Requirements for Ecological Impact Assessment**

1. In the ecological impact assessment, the Applicant shall examine the flora, fauna and other components of the ecological habitats within the study area. The aim shall be to protect, maintain or rehabilitate the natural environment. In particular, the Project shall avoid as far as possible impacts on recognized sites of conservation importance (e.g. Coastal Protection Area) and other ecological sensitive areas (e.g. intertidal, subtidal and benthic marine habitats, marine mammals habitats, rocky shore, sandy shore/mudflats, natural streams, woodland and grassland). The assessment shall identify and quantify as far as possible the potential ecological impacts associated with the Project, both directly by physical disturbance and indirectly by changes of water quality and hydrodynamic regime to the natural environment and the associated wildlife groups and habitats / species arising from the Project including its construction phases as well as the subsequent management and maintenance of the proposals.
2. The assessment shall include the following major tasks:
  - (i) review the findings of relevant studies / surveys and collate the available information regarding the ecological characters of the study area;
  - (ii) evaluate the information collected, identify any information gap relating to the assessment of potential ecological impacts to terrestrial and marine environment, and determine the ecological field surveys and investigations that are needed for a comprehensive assessment as required under the following sections;
  - (iii) carry out any necessary ecological field surveys with a duration of a least 4 months, and investigations to verify the information collected, fill in the information gaps as identified under sub-section (ii) above, if any, and to fulfil the objectives of the EIA study. The field surveys shall include but not be limited to flora, fauna and any other habitats/species of conservation importance;
  - (iv) establish the general ecological profile of the study area based on information collected in the tasks mentioned in sub-section (i) to (iii) above, and describe the characteristics of each habitat found; the data set should be comprehensive and representative, and is up to date and valid for the purpose of this assessment. Major information to be provided shall include :
    - (a) description of the physical environment, including all recognized sites of conservation importance and assessment of whether these sites will be affected by the Project or not;
    - (b) habitat maps of suitable scale (1:1000 to 1:5000) showing the types and locations of habitats and species of conservation interest in the study area;
    - (c) ecological characteristics of each habitat type such as size, vegetation and/or substrate type, species present, dominant species found, species richness and abundance of major taxa groups, inter-dependence of the habitats and species, and presence of any features of ecological importance;
    - (d) representative colour photos of each habitat type and any important ecological features identified; and
    - (e) species found that are rare, endangered and/or listed under local legislation, international conventions for conservation of wildlife / habitats or red data books.

- (v) investigate and describe the existing wildlife uses of various habitats with special attention to those wildlife groups and habitats with conservation interest, including but not limited to the following :
  - (a) coastal / marine waters;
  - (b) Intertidal shores, subtidal shores / coral communities;
  - (c) Benthic communities;
  - (d) sandy shores / rocky shores / inter-tidal mudflats;
  - (e) seahorses;
  - (f) linkages of habitats within the assessment area;
  - (g) avifauna;
  - (h) mammals;
  - (i) herpetofauna;
  - (j) insects (e.g. butterflies and dragonflies); and
  - (k) any other habitats / species identified as having special conservation interest by this EIA study.
  
- (vi) describe recognized site of conservation importance in the study area, if any, and assess whether these site will be affected by the Project or not.
  
- (vii) using suitable methodology, and considering also any works activities from other projects reasonably likely to occur at the time, identify and quantify as far as possible any direct (e.g. loss of habitats due to various elements such as dredging/excavation works and other associated works of the Project), indirect (e.g. changes in water qualities, hydrodynamics properties, hydrology, accidental discharge of untreated sewage, noise and other disturbance generated by the construction and operational activities etc), on-site, off-site, primary, secondary and cumulative ecological impacts on the wildlife groups and habitats identified such as destruction of habitats, reduction of species abundance/diversity, loss of feeding and breeding grounds, reduction of ecological carrying capacity and habitat fragmentation, in particular the following :
  - (a) habitat loss and disturbance to the intertidal, subtidal and benthic communities;
  - (b) disturbance to animals and plants;
  - (c) impacts due to habitat fragmentation and isolation;
  - (d) impacts to fish communities, intertidal organisms, subtidal organisms, seahorses and corals during the construction and operation stages due to potential changes in water quality and hydrodynamics properties during the construction and operation stages of the Project;
  - (e) impacts due to increase in human activities and disturbance during the construction and operation stages of the Project such as increase in light intensity; and
  - (f) cumulative impacts due to other planned and committed concurrent development projects at or near the Project area.
  
- (viii) evaluate ecological impact based on the best and latest information available during the course of the EIA study, using quantitative approach as far as practicable and covering construction and operational phases of the Project as well as the subsequent management and maintenance requirement of the Project;
  
- (ix) recommend possible alternatives, such as layer, design and alignment of the Project and modification / change of construction methods, and practicable mitigation measures to

avoid, minimize and/or compensate for the adverse ecological impacts identified during construction and operation of the Project;

- (x) evaluate feasibility and effectiveness of the recommended mitigation measures and definition of the scope, type, location, implementation arrangement, resources requirement, subsequent management and maintenance of such measures;
- (xi) determine and quantify as far as possible of the residual ecological impacts after implementation of the proposed mitigation measures;
- (xii) evaluate the severity and acceptability of the residual ecological impacts using well-defined criteria in Annex 8 of the TM and determine if off-site mitigation measures are necessary to mitigate the residual impacts and if affirmative, guidelines and requirements laid down in Annex 16 of the TM should be followed; and
- (xiii) review the need for and recommend any ecological monitoring programme required.

**Appendix G****Requirements for Fisheries Impact Assessment**

1. Existing information regarding the study area shall be reviewed. Based on the review results, the assessment shall identify data gap and determine if there is any need for field surveys to collect adequate baseline information. If field surveys are considered necessary, the assessment shall recommend appropriate methodology, duration and timing for such surveys.
2. The fisheries impact assessment shall cover any potential short-term and long-term impacts on capture and culture fisheries during the construction and operation phases of the Project.
3. The fisheries impact assessment shall provide the following information:-
  - (i) description of the physical environmental background;
  - (ii) description and quantification of the existing capture fishing and aquaculture activities;
  - (iii) description and quantification of the existing fisheries resources (e.g. capture fisheries/aquaculture production and value, major fish species);
  - (iv) identification of parameters (e.g. water quality parameters) and areas of fisheries importance;
  - (v) identification and evaluation of any direct/indirect impacts and on-site/off-site impacts to fisheries, such as potential loss or disturbance of fishing grounds, fisheries habitats, spawning or nursery grounds; water quality deterioration at sensitive receivers, such as fish culture zones or fishing grounds; impacts on capture fishing operations and aquaculture activities;
  - (vi) evaluation of cumulative impacts arising from interacting projects as identified in the EIA study;
  - (vii) proposals for environmental mitigation measures with details on justification, feasibility, scope and programme, as well as staff and financial implications including those related to subsequent management and maintenance requirements of such measures; and
  - (viii) review for the need of monitoring during the construction and operation phases of the Project and, if necessary, proposal for a monitoring and audit programme.

**Appendix H****Requirements for Landscape and Visual Impact Assessments**

1. The Applicant shall review relevant outline development plan(s), outline zoning plan(s), layout plan(s) or planning briefs and studies which may identify areas of high landscape value, e.g. green belt and woodland areas with sensitive landscape designations and visually sensitive areas/receivers. Any guidelines on landscape strategy, landscape framework, urban design concept, building height profiles, designed view corridors, open space network and landscape link that may affect the appreciation of the Project shall also be reviewed. The aim is to gain an insight to the future outlook of the area affected so as to assess whether the Project can fit into the surrounding setting. Any conflict with statutory town plan(s) shall be highlighted and appropriate follow-up action shall be recommended.
2. The Applicant shall describe, appraise, analyze and evaluate the existing and planned landscape resources and character of the study area. e.g. vegetation, woodland, streams, coastal features and topography, etc. A system shall be derived for judging landscape impact significance as required under the TM and EIAO Guidance Note No. 8/2010. Annotated oblique aerial photographs and plans of suitable scale showing the baseline landscape resources and landscape character areas and mapping of impact assessment shall be extensively used to present the findings of impact assessment. Descriptive text shall provide a concise and reasoned judgment from a landscape and visual point of view. The assessment shall be particularly focused on the sensitivity and magnitude of change of the landscape resources and landscape character areas. The Applicant shall identify the degree of compatibility of the Project with the existing and planned landscape settings. The landscape impact assessment shall quantify potential landscape impact as far as possible, so as to illustrate the significance of such impact arising from the Project. Clear mapping of the landscape impact is required. A broad brush tree survey to identify dominant tree species, maturity, rarity and any plant species of conservation interest, etc. should be conducted within the study area to provide baseline information on the landscape resources and landscape character areas and the impacts on existing trees shall be summarized. Cumulative landscape and visual impacts of the Project with other existing, committed and planned developments in the study area shall be assessed.
3. The Applicant shall assess the visual impacts of the proposed Project. Clear illustration including mapping of visual impact is required. The assessment shall adopt a systematic methodology and include the following:
  - (i) identification and plotting of visual envelope of the Project;
  - (ii) identification of the key groups of existing and planned sensitive receivers within the visual envelope and their views at both ground level and elevated vantage points. Among other receivers, sensitive receivers shall include, but not limited to, nearby residents and villagers. Both long distance view and short distance view shall be covered in the assessment;
  - (iii) assessment for evaluating visual impacts, by taking into account the factors affecting the sensitivity of receivers (including value and quality of existing views, availability and amenity alternative views, type and estimated number of receiver population, duration of view and degree of visibility) and the magnitude of change of view (including compatibility of the project with the surrounding landscape and planned setting, duration of impacts under construction and operation phases, scale of development, reversibility

of change, viewing distance and potential blockage of view). The visual impacts of the Project with and without mitigation measures shall also be included so as to demonstrate the effectiveness of the proposed mitigation measures;

- (iv) clear evaluations and explanation with supportive arguments of all relevant factors considered in arriving the significance thresholds of visual impacts.
4. The Applicant shall evaluate the merit and demerit of preservation in totality, in parts or total destruction of existing landscape and the establishment of a new landscape character area. Alternative location, site layout, development options, design and construction method that would avoid or reduce the identified landscape and visuals impacts shall first be considered and be evaluated for comparison before adopting other mitigation or compensatory measures to alleviate the impacts. The mitigation measures proposed shall not only be concerned with damage reduction but shall also include consideration of potential enhancement of the existing landscape and visual quality. The Applicant shall recommend mitigation measures to minimize the adverse effects identified above, including provision of a landscape mitigation plan to identify all recommended landscape mitigation measures.
  5. The mitigation measures shall not be limited to the preservation of vegetation, transplanting of trees of good amenity value, provision of screen planting, re-vegetation of disturbed lands, compensatory planting, re-provisioning of amenity areas and open spaces, design of structure, provision of finishes to structure, colour scheme and texture of material used and any measures to mitigate the disturbance of the existing land use. Parties shall be identified for the on-going management and maintenance of the proposed mitigation works to ensure their effectiveness throughout the operation phase of the Project. A practical programme and funding proposal for the implementation of the recommended measures shall be provided.
  6. Annotated illustration such as coloured perspective drawings, plans and section/elevation diagrams, oblique aerial photographs, photographs taken at vantage points and computer-generated photomontage, particularly from but not limited to the most severely affected vantage points shall be adopted to illustrate the significance of the landscape and visual impacts of the Project in four stages i.e. existing conditions, unmitigated impacts at Day 1, mitigated impacts at Day 1 and residual impact at Year 10. Options of design schemes should be illustrated with photomontages to show the visual impact on the surrounding areas. True colour samples may be requested if found necessary and appropriate. Technical details in preparing the illustration, which may need to be submitted for verification of accuracy of the illustration shall be recorded. Computer graphics shall be compatible with Microstation DGN file format.

**Appendix I**

**Implementation Schedule**

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location/Duration of measures/ Timing of completion of measures	Implementation Agent	Implementation Stage **				Relevant Legislation & Guidelines
					Des	C	O	Dec	

\*\* Des=Design; C=Construction; O=Operation; Dec=Decommissioning

**Appendix J****Requirements for EIA Report Documents**

1. The Applicant shall supply the Director with the following number of copies of the EIA report and the executive summary:
  - (i) 30 copies of the EIA report and 50 copies of the executive summary (each bilingual in both English and Chinese) as required under section 6(2) of the EIAO to be supplied at the time of application for approval of the EIA report.
  - (ii) When necessary, addendum to the EIA report and the executive summary submitted in item (i) above as required under section 7(1) of the EIAO, to be supplied upon advice by the Director for public inspection.
  - (iii) 20 copies of the EIA report and 50 copies of the executive summary (each bilingual in both English and Chinese) with or without Addendum as required under section 7(5) of the EIAO, to be supplied upon advice by the Director for consultation with the Advisory Council on the Environment.
2. In addition, to facilitate public inspection of EIA report via EIAO Internet Website, the Applicant shall provide electronic copies of both the EIA report and executive summary prepared in Hyper Text Markup Language (HTML) (version 4.0 or later) and in Portable Document Format (PDF version 1.3 or later), unless otherwise agreed by the Director. For the HTML version, a content page capable of providing hyperlink to each section and sub-section of the EIA report and executive summary shall be included in the beginning of the document. Hyperlinks to figures, drawings and tables in the EIA report and executive summary shall be provided in the main text from where respective references are made. Graphics in the report shall be in interlaced GIF format unless otherwise agreed by the Director.
3. The electronic copies of the EIA report and the executive summary shall be submitted to the Director at the time of application for approval of the EIA report.
4. When the EIA report and the executive summary are made available for public inspection under section 7(1) of the EIAO, the content of the electronic copies of the EIA report and the executive summary must be the same as the hard copies and the Director shall be provided with the most updated electronic copies.
5. To promote environmentally friendly and efficient dissemination of information, both hardcopies and electronic copies of future EM&A reports recommended by the EIA study shall be required and their format shall be agreed by the Director.