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9 July 2019

Civil Engineering and Development Department

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

**Project Title: Technical Study on Partial Development of Fanling Golf Course Site**  
**(Application No. ESB-318/2019)**

I refer to your above application received on 29 May 2019 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-318/2019) 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 ACE for selection for submission when you submit the EIA report to this department for approval. Please liaise with Ms. Becky LAM (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 Mr. Steve LI at 2835 1142.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'K H TO', written in a cursive style.

( K H T O )

Principal Environmental Protection Officer  
for Director of Environmental Protection

**ENVIRONMENTAL IMPACT ASSESSMENT ORDINANCE (CAP. 499)**  
**SECTION 5 (7)**

**ENVIRONMENTAL IMPACT ASSESSMENT STUDY BRIEF NO. ESB-318/2019**

**PROJECT TITLE:** Technical Study on Partial Development of Fanling Golf Course Site  
(hereinafter known as the “Project”)

**NAME OF APPLICANT:** Civil Engineering and Development Department  
(hereinafter known as the “Applicant”)

**1. BACKGROUND**

- 1.1 An application (No. ESB-318/2019) 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 29 May 2019 with a Project Profile (No. PP-583/2019) (hereinafter referred as the “Project Profile”).
- 1.2 The Applicant proposes to conduct a technical study on Partial Development of Fanling Golf Course Site (the Project) to examine the land uses and the feasibility of housing development (with emphasis on public housing) together with supporting infrastructure, government, institution or community facilities, open space and green belt at the Project area which covers 32 hectares (ha) of land of the Fanling Golf Course (FGC) located to the east of Fan Kam Road. The location of the Project area is shown in the figure attached in the Project Profile which is reproduced in Appendix A of this EIA Study Brief.
- 1.3 The Project is a designated project (DP) under Item 1 of Schedule 3 of the EIAO, which specifies that an “Engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100 000”. The Project also includes individual work items that may fall under Schedule 2 of the EIAO to be identified in the course of the EIA study. Based on the information provided in the Project Profile, the proposed works identified as potential DPs in Part I, Schedule 2 of the EIAO include the following :
- (i) Item F.2 - Sewage treatment works with an installed capacity of more than 5 000 m<sup>3</sup> per day and a boundary of which is less than 200 m from the nearest boundary of an existing or planned residential area.
  - (ii) Item F.3 - A sewage pumping station with an installed capacity of more than 2 000 m<sup>3</sup> per day and a boundary of which is less than 150m from an existing or planned residential area.
  - (iii) Item F.4 - An activity for the reuse of treated sewage effluent from a treatment plant.
- 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 under different development scenarios and associated activities 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 its staged implementation;
  - (ii) the conditions and requirements for the detailed design, construction and operation of the Project to mitigate against adverse environmental consequences wherever practicable; 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 the elements of the community and environment likely to be affected by the Project, and/or likely to cause adverse impacts to the Project, including both the 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 potentially affected uses;
- (iv) to identify and quantify any potential ecological and fisheries impacts arising from the construction and operation of the Project and to propose measures to mitigate these impacts;
- (v) to identify any potential landscape and visual impacts and to propose measures to mitigate these impacts;
- (vi) to identify any negative impacts on sites of cultural heritage and to propose measures to mitigate these impacts;
- (vii) to propose measures/actions to avoid or minimize potential archaeological impacts if any archaeological remains are identified during the construction of the Project;
- (viii) to identify and quantify contaminated land within any Project area for development works, and to propose measures to avoid disposal in the first instance;
- (ix) to propose the provision of infrastructure or mitigation measures to minimize pollution, environmental disturbance and nuisance during the construction and operation of the Project;
- (x) to investigate the feasibility, effectiveness and implications of the proposed

mitigation measures;

- (xi) to identify, predict and evaluate the residual (i.e. after practicable mitigation) environmental impacts 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;
- (xii) 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 residual environmental impacts and cumulative effects and reduce them to acceptable levels;
- (xiii) 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;
- (xiv) to identify, assess and evaluate the cumulative impacts arising from all the elements and works of the Project;
- (xv) to design and specify the environmental monitoring and audit requirements to ensure the implementation and the effectiveness of the environmental protection and pollution control measures adopted;
- (xvi) to identify any additional studies necessary to implement the mitigation measures or monitoring and proposals recommended in the EIA report; and
- (xvii) to identify DP(s) listed under Schedule 2 of the EIAO as part of the Project for assessment under the EIA study.

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

#### **3.1 The Purpose**

- 3.1.1 The purpose of this Study Brief is to set out the purposes and objectives of the EIA study, the scope of environmental issues which shall be addressed, the requirements that the EIA study shall need to fulfil, and the necessary procedural and reporting requirements. The Applicant shall 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 fully complied with.

#### **3.2 The Scope**

- 3.2.1 The scope of this EIA study shall cover the Project and associated works mentioned in sections 1.2 and 1.3 of this EIA Study Brief. For the purpose of assessing whether the environmental impacts shall comply with the criteria of the TM, the EIA study shall address the key issues described below, together with any other key issues identified during the course of the EIA study:

- (i) environmental benefits and dis-benefits of different land use options and layout options under different development scenarios, design and construction methods of the Project with a view to deriving the preferred land use option(s) and layout option(s) that will avoid or minimize adverse environmental impact. Particular attention shall be given to the acceptability of the overall environmental performance of the Project and associated works at all stages of implementation and cumulative effects due to interfacing existing, committed and planned projects in the vicinity of the Project;
- (ii) potential air quality impacts on air sensitive receivers (ASRs) (e.g. domestic premises including Ming Tak Court, Cheung Lung Wai Estate, On Po Tsuen, Ping Kong Village; education institutions including Tung Wah Group of Hospitals Ma Kam Chan Memorial Primary School, HHCKLA Buddhist Wisdom Primary School and Elegantia College; North District Hospital, etc.) during the construction and operation of the Project, including dust, gaseous emissions, odour, and vehicular emissions. Consideration shall be given to assessing the air quality impacts during different phases of the Project on the residents of the development upon population intake;
- (iii) potential noise impacts on the noise sensitive receivers (NSRs) (e.g. domestic premises including Ming Tak Court, Cheung Lung Wai Estate, On Po Tsuen, Ping Kong Village; education institutions including Tung Wah Group of Hospitals Ma Kam Chan Memorial Primary School, HHCKLA Buddhist Wisdom Primary School and Elegantia College; North District Hospital, etc.) during the construction and operation of the Project, including noise impacts from construction activities, road traffic, operation of fixed noise sources and helicopters. Consideration shall be given to assessing the noise impacts during different phases of the Project on the residents of the development upon population intake;
- (iv) potential water quality impacts caused by the Project and associated works on water system(s) including the Deep Bay Water Control Zone and relevant water sensitive receivers (including but not limited to watercourses/streams/channels within and near the Project area; Fanling stream(s); Sheung Yue River (River Beas); fish ponds; wetlands; freshwater habitats, etc.), during the construction and operation of the Project;
- (v) potential waste management implications arising from the construction and operation of the Project, including handling and disposal of construction and demolition materials, chemical waste, general refuse, domestic and any other waste generated during the operation of the Project;
- (vi) potential extent of land contamination arising from natural occurrence and anthropogenic input within any Project area for development works and relevant mitigation measures;
- (vii) potential sewerage and sewage treatment implications to cope with discharges from population and any development from the Project, taking into account the capacity requirements for the existing, committed and planned developments within the same sewage catchment and the capacity of the Shek Wu Hui Sewage Treatment Works;
- (viii) potential terrestrial and aquatic ecological impacts, in particular impacts on habitats including but not limited to semi-natural/natural streams, marshes, ponds, secondary

woodlands, grasslands, plantation; and species of conservation importance including but not limited to *Somanniathelphusa zanklon*, *Aquilaria sinensis*, *Aristolochia tagala*, *Glyptostrobus pensilis*, arising from the construction and operation of the Project;

- (ix) potential fisheries impacts arising from the construction and operation of the Project;
- (x) potential landscape impacts arising from the Project and potential visual impacts arising from the above-ground structures of the Project, including impacts to the existing landscape resources, the users of the Fanling Golf Course and residents of the nearby residential areas;
- (xi) potential cultural heritage impacts, in particular impacts on built heritage including Fanling Lodge, Clubhouse of The Hong Kong Golf Club Fanling Golf Course, Half-way House of The Hong Kong Golf Club Fanling Golf Course, and No. 5 Ng Uk Tsuen, as well as graves, due to the Project;
- (xii) measures/actions to avoid or minimize potential human health impacts associated with reuse of treated sewage effluent during the operation of the Project;
- (xiii) potential cumulative impacts of the Project, through interaction or in combination with other existing, committed and planned projects in the vicinity of the Project; and
- (xiv) identification of individual DPs proposed under the Project that fall under Schedule 2 of the EIAO, in addition to those mentioned in section 1.3 of this EIA Study Brief, including but not limited to the potential widening of Fan Kam Road and/or other road works, and the treatment and disposal of pre-treated organic waste from internal and external sources in the proposed sewage treatment works; to ascertain whether the findings of this EIA study have adequately assessed and addressed the environmental impacts of those DPs; and where necessary to identify the outstanding issues that need to be assessed and addressed in any further detailed EIA studies.

### **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, describe the need of the Project, 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 Project details that may affect the potential environmental impacts, including but not limited to the siting, proposed land uses, layout and design, facilities to be provided in the Project, scale/height of the structures and facilities with layout plans, construction methods, sequence of construction works and other major activities involved in the construction and operation of the Project, and use diagrams, plans and/or maps as necessary. The estimated duration of the construction phase and operation phase of the Project together with the programme within these phases shall be given. The land taken by the Project area, works areas and any associated access arrangements, auxiliary facilities and landscaping areas shall be shown on a scaled map. The uses of the Project shall be described and the different land use areas shall be demarcated as

appropriate. The Applicant shall provide information to identify and address the main concerns of the general public and special interest groups (club, societies etc.).

### 3.3.3 Background and History of the Project

The Applicant shall provide information on the site location and site history of the Project, interactions with other projects, and the consideration of the different land use options and layout options, taking into account the principles of avoidance, minimizing and control of adverse environmental impacts. The options might include consideration of alternative design and development options, scale/size of the above-ground structures, construction methods and sequence of construction works, any lessons learned from other similar projects, practicable siting for the supporting infrastructures at available locations, opportunities for social and recreational activities/facilities, as well as its compatibility with the surrounding. The key reasons for selecting the proposed land use option and layout option of the Project and the part environmental factors played in the selection shall be described. The main environmental impacts of different land use and layout options under different development scenarios shall be compared with those of recommended option 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 all environmental aspects of the activities as described in the scope as set out above. The assessment shall be based on the best and latest information available during the course of the EIA study.

3.4.2 The Applicant shall include in the EIA report details of the construction programme and methodologies. The Applicant shall clearly state in the EIA report the time frame and work programmes of the Project and associated works and other concurrent projects, and assess the cumulative environmental impacts from the Project and associated works with all interacting projects, including staged implementation of the Project and associated works. 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 as stated in section 1 of Annex 4 and Annex 12 of the TM respectively.

3.4.3.2 The assessment area for the air quality impact assessment shall be defined by a distance of 500 metres from the boundary of the Project area and the works of the Project as identified in the EIA, which shall be extended to include major existing, committed and planned air pollutant emission sources identified to have a bearing on the environmental acceptability of the Project. The assessment shall include the existing, committed and planned sensitive receivers within the assessment area as well as any proposed air sensitive receivers within the Project as identified in the EIA and areas where air quality may be potentially affected by the Project. The assessment shall be based on the best available information at the time of the assessment. Odour impacts from the operation of new sewage treatment works, the sewage pumping station and refuse collection points proposed under the Project shall also be assessed. The assessment shall also take into account the impacts of emission sources from nearby concurrent projects, if any. The Applicant shall describe the transportation routings and frequency of the dump trucks, if any, with a view to addressing potential nuisance caused by dump truck movements during the construction phase of the Project.



3.4.3.3 The assessment of the air quality impacts arising from the construction and operation of the Project shall follow the detailed technical requirements given in Appendix B of this EIA Study Brief.

#### 3.4.4 **Noise Impact**

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

3.4.4.2 The assessment area for the noise impact assessment, other than helicopter noise, shall be defined by a distance of 300 metres from the boundary of the Project area. Assessment shall include construction noise, road traffic noise, fixed noise sources and helicopter noise impacts on the existing, committed and planned Noise Sensitive Receivers (NSRs) earmarked on the relevant Outline Zoning Plans, Development Permission Area Plans, Outline Development Plans, Layout Plans and other relevant published land use plans, including plans and drawings published by the Lands Department and any land use and development applications approved by the Town Planning Board, in the vicinity of the Project.

3.4.4.3 The noise impact assessment of the Project shall follow the detailed technical requirements given in Appendix C of this EIA Study Brief.

3.4.4.4 The Applicant shall evaluate whether the Project area is within Noise Exposure Forecast (NEF) 25 contour of the flight path(s) under the Three-Runway System of Hong Kong International Airport, and whether the Project area is within the departure and landing flight path(s) of the Shek Kong Airfield. If confirmed, an aircraft/helicopter noise impact assessment shall be conducted, which shall follow the criteria for evaluating aircraft/helicopter noise as stated in Annex 5 of the TM. The Applicant shall submit a methodology statement to provide with justifications the scope, approach and methodology to be adopted in the aircraft/helicopter noise impact assessment for the agreement of the Director prior to the commencement of assessment on aircraft/helicopter noise.

#### 3.4.5 **Water Quality Impact**

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

3.4.5.2 The assessment area for the water quality impact assessment shall include areas within 500 metres from the boundary of the Project area and shall cover the Deep Bay Water Control Zone and other affected Water Control Zones as designated under the Water Pollution Control Ordinance (Cap. 358) and water sensitive receivers in the vicinity of the Project. The assessment area shall be extended to include other areas if they are found also being impacted during the course of the EIA study and have a bearing on the environmental acceptability of the Project.

3.4.5.3 The water quality impact assessment for the construction and operation of the Project shall follow the detailed technical requirements given in Appendix D of this EIA Study Brief.

#### 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 downstream public sewerage, sewage treatment and disposal facilities as stated in

section 6.5 in Annex 14 of the TM respectively.

3.4.6.2 The assessment of the sewerage and sewage treatment implications for the Project shall follow the detailed technical requirements given in Appendix E of this EIA Study Brief.

#### 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 arising from the construction and operation of the Project shall follow the detailed technical requirements given in Appendix F of this EIA Study Brief.

#### 3.4.8 **Land Contamination**

3.4.8.1 The Applicant shall follow the guidelines for evaluating and assessing potential land contamination issue(s) 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(s) shall follow the detailed requirements given in Appendix G of this EIA Study Brief.

3.4.8.3 The Applicant shall refer to the results of land contamination assessment, and where necessary, carry out further work to assess whether there is the presence of high level of arsenic within the Project area and any associated works area. If confirmed, the Applicant shall determine with justifications whether the arsenic is arising from anthropogenic input or natural occurrence.

3.4.8.4 If high level of naturally-occurring arsenic is found present within the Project area and any associated works area, a health impact assessment shall be conducted, which shall be based on established international practices. A literature search shall be carried out to determine the best approach and methodology for the health impact assessment, including any codes of practices, guidelines, etc. applicable to Hong Kong with suitable reference to the approved EIA report of North East New Territories New Development Areas (Register no.: AEIAR-175/2013).

3.4.8.5 In the event that a health impact assessment is required pursuant to section 3.4.8.4 above, the Applicant shall submit a methodology statement to provide with justifications the scope, approach and methodology to be adopted in the health impact assessment for the agreement of the Director prior to the commencement of assessment.

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

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

3.4.9.2 The assessment area for the purpose of the terrestrial and aquatic ecological impact assessment shall include areas within 500 metres distance from the boundary of the Project area and any other areas likely to be impacted by the Project.

3.4.9.3 Based on the latest scope and information of the Project, the Applicant shall make

reference to the technical requirements given in Appendix H and submit a methodology statement to provide with justifications the scope, approach and methodology to be adopted in the terrestrial and aquatic ecological impact assessments for the agreement of the Director prior to the commencement of assessment.

#### 3.4.10 **Fisheries Impact**

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

3.4.10.2 The assessment area for fisheries impacts shall include areas within 500 metres distance from the boundary of the Project area which is the same area as aquatic ecological impact assessment. This assessment area shall be extended to include other areas if there are also found being impacted by the construction or operation of the Project during the course of the EIA study. Special attention should be given to fish pond culture resources and activities as well as any watercourses which serve as water sources for fish pond areas.

3.4.10.3 The fisheries impact assessment for the construction and operation of the Project shall follow the detailed technical requirements given in Appendix I of this EIA Study Brief.

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

3.4.11.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing the landscape and visual impacts as stated in Annexes 10 and 18 of the TM.

3.4.11.2 The assessment area for the landscape impact assessment shall include all areas within 500 metres distance from the boundary of the Project area and the works of the Project as identified in the EIA, while the assessment area for the visual impact assessment shall be defined by the visual envelope of the Project. The defined envelope shall be shown on a plan in the EIA report.

3.4.11.3 Based on the latest scope and information of the Project, the Applicant shall make reference to the technical requirements given in Appendix J and submit a methodology statement to provide with justifications the scope, approach and methodology to be adopted in the landscape and visual impact assessments for the agreement of the Director prior to the commencement of assessment.

#### 3.4.12 **Impact of Cultural Heritage**

3.4.12.1 The Applicant shall follow the criteria and guideline for evaluating and assessing the cultural heritage impacts as stated in section 2 of Annex 10 and section 2 of Annex 19 of the TM respectively.

3.4.12.2 The assessment area for the cultural heritage impact assessment shall be defined by a distance of 500 metres from the boundary of the Project area. The cultural heritage impact assessment shall include a Built Heritage Impact Assessment (BHIA) and an Archaeological Impact Assessment (AIA) for the construction and operation of the Project. Based on the latest scope and information of the Project, the Applicant shall make reference to the detailed technical requirements given in Appendix K of this EIA Study Brief and submit a methodology statement to provide with justifications the scope, approach and methodology to be adopted in the BHIA and AIA for the agreement of the Director prior to the commencement of assessment.

### **3.5 Environmental Monitoring and Audit (EM&A) Requirements**

- 3.5.1 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 the EM&A requirements for the Project in the EIA study.
- 3.5.2 Subject to the confirmation of the EIA study findings, the Applicant shall comply with the requirements as stipulated in Annex 21 of the TM.
- 3.5.3 The Applicant shall prepare a Project Implementation Schedule (in the form of a checklist as shown in Appendix L) containing all the EIA study recommendations and mitigation measures with reference to the implementation programme.

### **3.6 Presentation of Summary Information**

#### **3.6.1 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 (e.g. green roof, vertical greening), key environmental problems avoided, compensation areas included and the environmental benefits of environmental protection measures recommended (e.g. reduction of heat island effect).

#### **3.6.2 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.

#### **3.6.3 Documentation of Key Assessment Assumptions and Limitations, Limitation of Assessment Methodologies and related Prior Agreement(s) with the Director**

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 relevant prior agreement(s) with the Director or other Authorities on individual environmental media assessment component. The proposed use of any alternative assessment tool(s) or assumption(s) has 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.

#### **3.6.4 Summary of Alternative Options and Mitigation Measures**

The EIA report shall contain a summary of alternative land use options and layout options under different development scenarios and mitigation measures considered during the course of the EIA study, including design, scale/size of the above-ground structures, land

use/layout options, the sewage treatment/disposal methods, and mode of operation as well as construction methods and sequences of works for the Project, with a view to avoiding or minimizing adverse environmental impacts. A comparison of the environmental benefits and dis-benefits of applying different land use options and layout options under different development scenarios, and mitigation measures shall be made. This summary shall cover the key impacts and shall also form an essential part of the executive summary of the EIA report.

#### 3.6.5 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 from and identified by the Applicant during the course of the EIA study, and describe how the relevant concerns have been taken into account.

### 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 this EIA Study Brief, the Applicant shall apply to the Director for a fresh EIA Study Brief before commencement of the EIA study.

### 5. **REPORTING 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. When submitting the EIA report to the Director, the Applicant shall provide a summary, pointing out where in the EIA report the respective requirements of this EIA Study Brief and the TM (in particular Annexes 11 and 20) have been addressed and fulfilled.
- 5.2 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 M 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.
- 5.3 To facilitate enhanced public engagement in the EIA process, the Applicant shall produce 3-dimensional electronic visualizations of the findings of the EIA report, including baseline environmental information, the environmental situations with or without the Project, associated works, supporting facilities and essential infrastructures, key mitigated and unmitigated environmental impacts, and key recommended environmental mitigation measures so that the public can better understand the Project and the associated environmental issues. The visualizations shall be based on the EIA report findings and shall be released to the public as part of the EIA report. The 3-dimensional visualizations shall be developed and constructed such that they can be accessed and viewed by the public through an internet browser and/or other tools of 3-dimensional electronic visualizations (i.e. Virtual Reality, Augmented Reality, Mixed Reality) at a reasonable speed and without the need for software license requirement at the user's end. The visualizations shall be submitted in 10 copies of CD-ROM, DVD±R or other suitable means as agreed with the

Director.

**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 sections 1.2 and 1.3 of this EIA Study Brief and in the Project Profile (No. PP-583/2019), 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 this EIA Study Brief, the Applicant shall apply to the Director for a fresh EIA Study Brief.

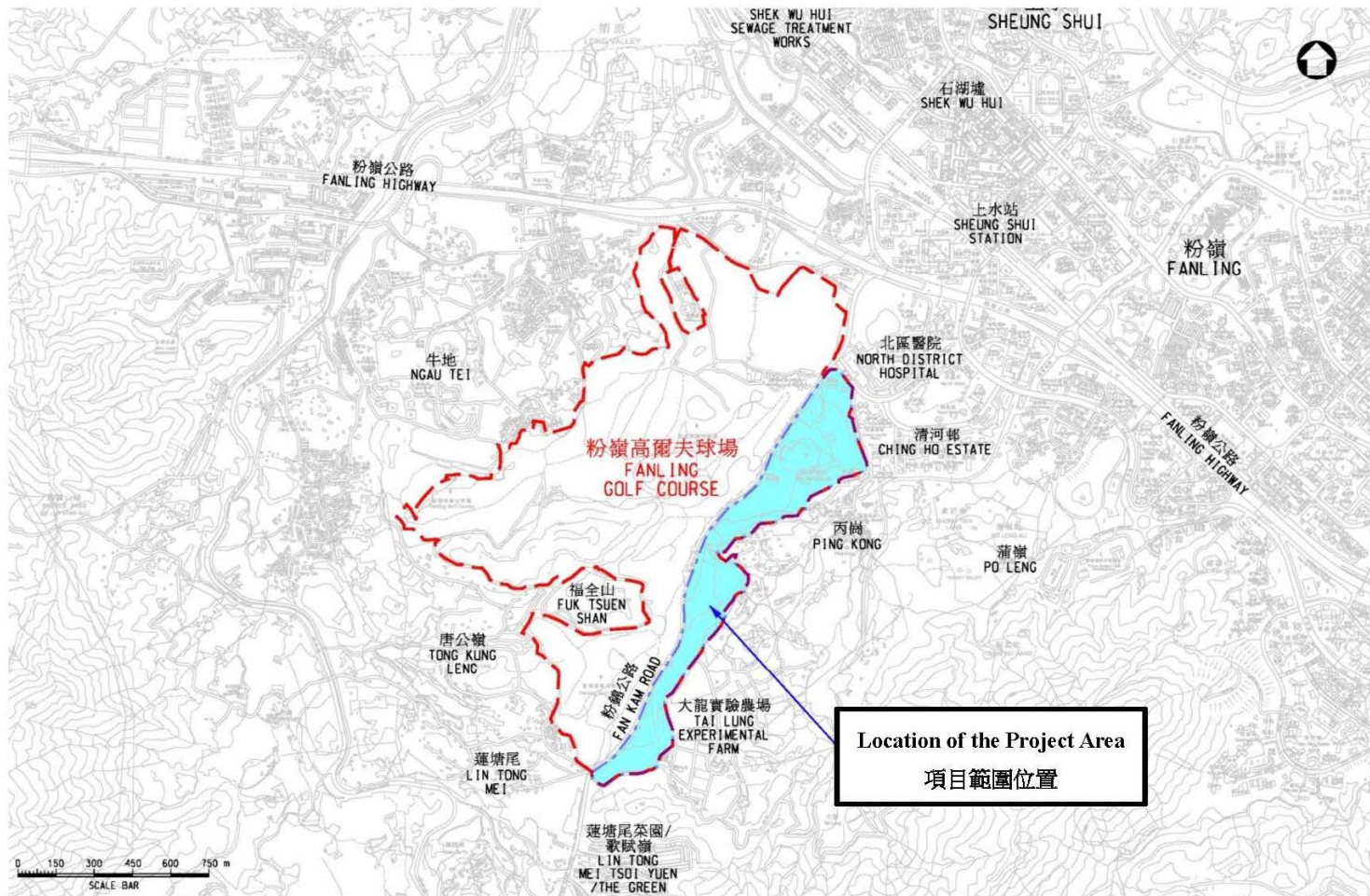
## **7. LIST OF APPENDICES**

7.1 This EIA Study Brief includes the following appendices:

- Appendix A – Project Area Location Plan
- Appendix B – Requirements for Air Quality Impact Assessment
- Appendix B-1 – Air Quality Modelling Guidelines
- Appendix C – Requirements for Noise Impact Assessment
- Appendix D – Requirements for Water Quality Impact Assessment
- Appendix E – Requirements for Assessment of Sewerage and Sewage Treatment Implications
- Appendix F – Requirements for Assessment of Waste Management Implications
- Appendix G – Requirements for Land Contamination Assessment
- Appendix H – Requirements for Ecological Impact Assessment (Terrestrial and Aquatic)
- Appendix I – Requirements for Fisheries Impact Assessment
- Appendix J – Requirements for Landscape and Visual Impact Assessment
- Appendix K – Requirements for Cultural Heritage Impact Assessment
- Appendix L – Implementation Schedule of Recommended Mitigation Measures
- Appendix M – Requirements for EIA Report Documents

--- END OF EIA STUDY BRIEF ---

July 2019  
Environmental Assessment Division  
Environmental Protection Department



Location of the Project Area  
項目範圍位置

**Project Title : Technical Study on Partial Development of Fanling Golf Course Site**  
 (This figure is prepared based on Drawing no. CDNNORZ0012 of Project Profile No.: PP-583/2019)  
 工程項目名稱：粉嶺高爾夫球場用地局部發展技術研究  
 (本圖是根據工程項目簡介 PP-583/2019 圖則編號 CDNNORZ0012 編製)

**EIA Study Brief No:** ESB-318/2019  
**環評研究概要編號:**

**Appendix A: Project Area Location Plan**  
**附錄 A: 項目範圍位置圖**





**Appendix B**

**Requirements for Air Quality Impact Assessment**

The air quality impact assessment shall include the following:

1. Background and Analysis of Activities

- (i) 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 both construction and operation phases of the Project.
- (ii) Provision of an account, where appropriate, of the consideration/measures that have been taken into consideration during the planning of the Project to abate the air pollution impacts. The Applicant shall consider alternative construction methods, phasing programmes and alternative modes of operation to minimize the air quality impacts during the construction and operation phases of the Project.
- (iii) Presentation of background air quality levels in the study area for the purpose of evaluating cumulative air quality impacts during the construction and operation phases of the Project. If the PATH model is used to estimate the future background air quality, details for the estimation of all 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, committed and planned 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, Layout Plans and other relevant published land use plans, including plans and drawings published by the 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. For phased development, the Applicant shall review the development programme and, where appropriate, to include occupiers of earlier phases as ASRs of construction phase impacts if they may be affected by works of later phases.
- (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 construction and operation activities in section 1 above. Examples of construction phase emission sources include stock piling, material handling and vehicular movements on unpaved haul roads on site. Examples of operation stage emission sources include exhaust emissions from vehicles and industrial chimneys; odour emissions from the proposed sewage pumping station, refuse collection points, drainage channels and nullahs, sewage treatment facilities, waste management facilities, etc. Confirmation regarding the validity of the assumptions adopted and the magnitude of activities (e.g. volume of construction material to be handled, odour emission strength, etc.), where applicable, shall be obtained from the relevant

government departments/authorities, and documented in the EIA report.

- (iii) Identification of existing and potential chimneys and obtainment of relevant chimney emission data in the assessment area, where appropriate, by carrying out a survey for assessing the cumulative air quality impacts of air pollutants through chimneys. The Applicant shall ensure and confirm the validity of the emission data used in their assessment. Any errors found in their emission data used may render the submission invalid.
- (iv) 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 impacts at the existing, committed and planned ASRs within the assessment area as well as the proposed air sensitive uses within the Project 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 identified within the assessment area and the Project area as defined in section 3.4.3.2 of this EIA Study Brief despite the incorporation of the dust control measures proposed, a quantitative assessment shall be carried out to evaluate the construction dust impacts at the identified ASRs. The Applicant shall follow the methodology set out in section 5 below when carrying out the quantitative assessment.
- (iii) Where necessary, the Applicant shall consider and evaluate direct mitigation measures, including but not limited to water-spraying, re-scheduling construction programme to minimize concurrent dust impacts arising from different construction sites, for fugitive dust control. The Applicant shall describe the means of transportation and their routings involved, with a view to addressing potential dust nuisance caused by transportation activities. Any mitigation measures recommended for fugitive dust control should be well documented in the EIA report.
- (iv) A monitoring and audit programme for the construction phase of the Project shall be devised to verify the effectiveness of the proposed control measures so as to ensure proper control of fugitive dust emission.

### 4. Operational Phase Air Quality Impact

- (i) The Applicant shall assess the expected air pollutant and odour concentrations at the ASRs identified within the assessment area and the Project area as defined in section 3.4.3.2 of this Study Brief based on an assumed reasonable worst-case scenario under normal operation conditions of the Project.
- (ii) 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 assessment.

- (iii) A monitoring and audit programme for the operational phase of the Project shall be devised to verify the effectiveness of the proposed control measures so as to ensure proper control of operational air quality impacts.

## 5. Quantitative Assessment Methodology

- (i) The Applicant shall conduct quantitative assessment by applying the general principles enunciated in the modelling guidelines in Appendix B-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. In case of doubt, prior agreement between the Applicant and the Director on specific modelling details should be sought.
- (ii) For the purpose of assessing the compliance with the criteria as stated in Annex 4 of the TM, the Applicant shall identify the key/representative air pollution parameters (types of pollutants and the averaging time concentrations) to be evaluated and provide explanation for selecting these parameters for assessing the impacts of the Project.
- (iii) Calculation of the relevant pollutant emission rates for input to the model and a map showing the emission sources shall be presented in the EIA report. A summary table of the emission rates shall be presented in the EIA report. The Applicant shall ensure consistency between the text description and the model files at every stage of submission for review. In case of doubt, prior agreement between the Applicant and the Director on the specific modelling details should be sought.
- (iv) The air quality impacts of future road traffic should be calculated based on the highest emission strength from road vehicles in the assessment area within the next 15 years after the first population intake year of the Project or within the next 5 years after the full population intake year of the Project, whichever is later, taking into account the air quality effect of proposed road works. 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 may use the EMFAC-HK model to determine the Fleet Average Emission Factors, taking into account vehicle fleet mix and other necessary data, or other models as agreed by the Director. Unless otherwise agreed by the Director, the latest version of the EMFAC-HK model shall be used. Use of any alternatives to the EMFAC-HK model shall be agreed with the Director. The traffic flow data and assumptions, such as the exhaust technology fractions, vehicle age/population distribution, traffic speed forecast that are used in the assessment shall be presented in the form of both summary table(s) and graph(s).
- (v) For estimating the future background air quality, the Applicant may use EPD's PATH model or results, taking into consideration the major air pollutant emission sources projected for Hong Kong and nearby regions. Unless otherwise agreed by the Director, the latest version of the PATH model shall be used. Use of any

alternatives to the PATH model shall be agreed with the Director. Details of the adopted emission sources should be presented.

- (vi) Ozone Limiting Method (OLM) or Discrete Parcel Method (DPM) or other appropriate method shall be used to estimate the conversion ratio of NO<sub>x</sub> to NO<sub>2</sub> if NO<sub>2</sub> has been identified as a key/representative air pollutant.
- (vii) The Applicant shall calculate the cumulative air quality impacts at the identified ASRs and compare these results against the criteria set out in section 1 of Annex 4 in the TM. The Applicant shall also calculate the incremental air quality impacts at the identified ASRs arising from the Project. The predicted cumulative 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 shall be used to present pollution contours to allow buffer distance requirements to be determined properly.
- (viii) 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 impacts 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.
- (ix) If there are any direct technical noise remedies recommended in the study, the air quality implication, i.e. comparison between with and without noise remedies scenarios, 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 impacts shall be assessed. If noise enclosure is proposed, then portal emissions of the enclosed road section shall also be addressed. The Applicant shall highlight clearly the locations and types of agreed noise mitigating measures (where applicable), be they noise barriers, road enclosures and their portals, and affected ASR's, on contour maps for reference.

## 6. Mitigation Measures for Air Quality Impact

### Consideration for Mitigation Measures

- (i) When the predicted air quality impact exceeds the criteria set in section 1 of Annex 4 in the TM, the Applicant shall consider mitigation measures to reduce the air quality impacts on the identified ASRs. The feasibility, practicability, programming and effectiveness of the recommended mitigation measures shall be assessed and documented in the EIA report. Specific reasons for not adopting certain workable mitigation measures to reduce the air quality to a level meeting the criteria in the TM or to maximise the protection of the ASRs as far as possible should be clearly substantiated and documented in the EIA report.

### Evaluation of Residual Air Quality Impact

- (ii) Upon consideration of mitigation measures, if the mitigated air quality impact still

exceeds the relevant criteria in Annex 4 of the TM, the Applicant shall identify, predict and evaluate the residual air quality impacts in accordance with section 4.4.3 of the TM and estimate the total number of existing dwellings, classrooms and other air sensitive elements that will be exposed to residual air quality impacts exceeding the criteria set in Annex 4 in the TM.

7. Submission of Emission Calculation Details and Model Files

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

### **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 judgment 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 (Revised);
- ii) Guidelines on Assessing the “Total” Air Quality Impact (Revised);
- iii) Guidelines on the Use of Alternative Computer Models in Air Quality Assessment;
- 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 C****Requirements for Noise Impact Assessment**

The noise impact assessment shall include the following:

**1. Description of the Noise Environment**

- 1.1 The Applicant shall describe the prevailing noise environment in the EIA report.
- 1.2 The Applicant shall conduct prevailing background noise surveys to determine the standards for evaluating noise impact from fixed noise sources. The respective noise environment should be documented 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 sections 5.3 and 5.4 of Annex 13 of the TM.
- 2.1.2 For ground-borne construction noise impact, the Applicant shall propose assessment methodology and computational model which shall be confirmed with the Director, with reference to section 4.4.2 of the TM, prior to the commencement of the assessment. Site measurements at appropriate locations may be required in order to obtain the empirical input parameters required in the computational model.

**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 area and the works of the Project.
- (b) The Applicant shall identify all existing 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 at various representative floor levels (in m P.D.) on tables and plans of suitable scale.
- (b) The assessment shall cover the cumulative construction noise impacts 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 potential construction noise impacts under different phases of construction shall be quantified by estimating the total number of dwellings, classrooms and other noise sensitive receivers that will be exposed to noise impacts exceeding the criteria set in Annex 5 in the TM.
- (d) 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

### *Direct Mitigation Measures*

Where the predicted construction noise impact exceeds the criteria set in Table 1B of Annex 5 of the 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.



## 2.5 Evaluation of Residual Construction Noise Impact

Upon exhaust of direct mitigation measures, if the mitigated noise impact still exceeds the relevant criteria in Annex 5 of the TM, the Applicant shall identify, predict, evaluate the residual construction noise impact in accordance with section 4.4.3 of the TM and estimate the total number of existing dwellings, classrooms and other noise sensitive elements that will be exposed to residual noise impact exceeding the criteria set in Annex 5 in the TM.

## 3. Road Traffic Noise Impact Assessment

### 3.1 Road Traffic Noise Impact Assessment Methodology

3.1.1 The Applicant shall carry out road traffic noise impact assessment in respect of each road section (within the meaning of Items A.1, A.7 and A.8 under Part I, Schedule 2 of the EIAO and other road sections) and the noise levels from combined road sections of the Project at the NSRs in accordance with methodology in section 5.1 of Annex 13 of the TM.

#### 3.1.2 *Input Data of Computational Model*

The Applicant shall provide the input data set of the road traffic noise computational model adopted in the assessment for various scenarios. The data shall be in electronic text file (ASCII format) containing road segments, barriers and noise sensitive receivers information. CD-ROM(s) containing the above data shall be submitted together with the EIA report.

### 3.2 Identification of Road Traffic Noise Impact

#### 3.2.1 *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 road traffic noise impacts 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 road traffic noise impact assessment described below.
- (c) The assessment points shall be confirmed with the Director prior to the commencement of the quantitative road traffic 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.
- (e) For planned noise sensitive land uses without committed site layouts, the Applicant should use the relevant land use and planning parameters and conditions to work out representative site layouts for road traffic noise impact assessment purpose. However, such parameters, conditions and site layouts together with any constraints identified shall be confirmed with the relevant responsible parties including Planning Department and Lands Department.

### 3.2.2 *Inventory of Noise Sources*

- (a) The Applicant shall analyse the scope of the proposed road alignment(s) to identify appropriate new and existing road sections for the purpose of road traffic noise impact assessment. Road sections to be included in road traffic noise impact assessment shall be confirmed with the Director prior to the commencement of the assessment. In determining whether the traffic noise impact due to road improvement project/works is considered significant, detailed information with respect to factors including at least the change of nature of road, change of alignment and change of traffic capacity or traffic composition, and change of traffic flow pattern in the associated road networks, shall be assessed. Figures showing extents of new/altered roads, existing roads and the associated road networks shall be provided in the EIA report.
- (b) Validity of the traffic flow prediction of road sections for the purpose of road traffic noise impact assessment shall be confirmed with Transport Department and documented in the EIA report.

### 3.3 Prediction and Evaluation of Road Traffic Noise Impact

#### 3.3.1 *Scenarios*

- (a) The Applicant shall quantitatively assess the road traffic noise impacts of the Project, with respect to the criteria set in Annex 5 of the TM, of unmitigated scenario and mitigated scenario at assessment year. The assessment year shall be made reference to section 5.1 in Annex 13 of the TM.
- (b) The Applicant shall prepare and provide drawings (i.e. road-plots of the traffic noise model) of appropriate scale to show the road segments, topographic barriers, and assessment points of sensitive receivers input into the traffic noise model.
- (c) The Applicant shall provide the input data sets of traffic noise prediction model adopted in the EIA study as requested by the Director for the following scenarios:
  - (i) unmitigated scenario at assessment year;
  - (ii) mitigated scenario at assessment year;
  - (iii) scenario without the Project at assessment year; and
  - (iv) prevailing scenario for indirect mitigated measures eligibility assessment.

#### 3.3.2 *Prediction of Noise Impact*

- (a) The Applicant shall present the predicted noise levels in L10 (1 hour) dB(A) at the selected assessment points at various representative floor levels (in m P.D.) on tables and plans of suitable scale.
- (b) The assessment shall cover the cumulative road traffic noise impacts resulting from the road traffic noise due to the Project and existing road network on existing, committed and planned NSRs within the assessment area.
- (c) The potential road traffic noise impacts under different scenarios shall be quantified by estimating the total number of dwellings, classrooms and other noise sensitive receivers that will be exposed to noise impacts exceeding the criteria set in Annex 5 in the TM.
- (d) 3-dimensional electronic visualizations of the road traffic noise predictions of the EIA report, including impacts with and without the Project, and the mitigated and

unmitigated impacts shall be presented. The Applicant shall follow the requirements set out in section 5.3 of this EIA Study Brief when producing the electronic visualizations.

### 3.4 Mitigation of Road Traffic Noise Impact

#### 3.4.1 *Direct Mitigation Measures*

- (a) Where the predicted road traffic noise impact exceeds the criteria set in Annex 5 of the TM, the Applicant shall consider and evaluate direct mitigation measures including but not limited to low noise road surface, noise barrier/enclosure, screening by noise tolerant buildings 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 quantified and documented in the EIA report.
- (b) The total number of noise sensitive receivers that will be benefited from and be protected by the provision of direct mitigation measures should be provided. The total number of other noise sensitive receivers that will still be exposed to noise above the criteria with the implementation of all recommended direct mitigation measures shall be quantified.
- (c) For traffic noise impacts arising from new road projects on planned noise sensitive uses, all practicable direct mitigation measures at source shall be implemented on the road projects before consideration of mitigation measures within the planned noise sensitive uses. Should planned noise sensitive uses still be affected even with practicable direct mitigation measures at source in place, the Applicant shall propose, evaluate and confirm the practicability of additional direct mitigation measures within the planned noise sensitive uses and shall make recommendations on how these noise sensitive uses will be designed for the information and agreement of relevant parties including Planning Department and Lands Department.
- (d) The Applicant shall take into account agreed environmental requirements /constraints identified in the EIA study to assess the development potential of concerned sites which shall be made known to the relevant parties.

#### 3.4.2 *Indirect Mitigation Measures*

- (a) Upon exhaust of direct mitigation measures, where the predicted road traffic noise impact still exceeds the criteria set in Table 1A of Annex 5 of the TM, the Applicant shall consider indirect mitigation measures in the form of window insulation and air-conditioning and evaluate in accordance with section 6.2 in Annex 13 of the TM.
- (b) The Applicant shall identify and estimate the total number of existing dwellings, classrooms and other noise sensitive elements which may qualify for indirect mitigation measures, the associated costs and any implications for such implementation.
- (c) For the purpose of determining eligibility of the affected premises for indirect mitigation measures, reference shall be made to methodology accepted by the recognized national/international organization or methodologies adopted for Hong Kong projects having similar issues on proposing an assessment methodology for

determining eligibility of the indirect mitigation measures which shall be confirmed with the Director with reference to section 4.4.2 of the TM, prior to the commencement of the assessment.

### 3.5 Evaluation of Residual Road Traffic Noise Impact

Upon exhaust of direct and indirect mitigation measures, if the mitigated noise impact still exceeds the relevant criteria in Annex 5 of the TM, the Applicant shall identify, predict and evaluate the residual road traffic noise impact in accordance with section 4.4.3 of the TM and section 6.2 in Annex 13 of the TM.

## 4. Fixed Noise Sources Impact Assessment

### 4.1 Fixed Noise Sources Impact Assessment Methodology

The Applicant shall carry out fixed noise sources impact assessment from the Project in accordance with methodology in section 5.2 of Annex 13 of the TM.

### 4.2 Identification of Fixed Noise Sources Impact

#### 4.2.1 *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 fixed noise impact 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 fixed noise sources impact assessment described below.
- (c) The assessment points shall be confirmed with the Director prior to the commencement of the quantitative fixed noise sources 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.
- (e) For planned noise sensitive land uses without committed site layouts, the Applicant should use the relevant land use and planning parameters and conditions to work out representative site layouts for fixed noise sources assessment purpose. However, such parameters, conditions and site layouts together with any constraints identified shall be confirmed with the relevant responsible parties including Planning Department and Lands Department.

#### 4.2.2 *Inventory of Noise Sources*

- (a) The Applicant shall identify and quantify an inventory of noise sources for fixed noise sources impact assessment. The inventory of noise sources shall include, but not limited to noise associated with any permanent and temporary industrial noise sources including storage sites, vehicle repairing yards, workshops, ventilation system(s) of building(s) and/or tunnel(s), pumping station(s), sewage treatment works, public

transport facilities and electricity substation(s), etc.

- (b) The Applicant shall provide document or certificate, accepted by recognized national/international organization, for the sound power level of each type of fixed noise sources.
- (c) Validity of the inventory shall be confirmed with the relevant government departments/authorities and documented in the EIA report.

#### 4.3 Prediction and Evaluation of Fixed Noise Source Impact

##### 4.3.1 *Scenarios*

- (a) The Applicant shall quantitatively assess the fixed noise source impact with respect to criteria set in Annex 5 of the TM, of unmitigated scenario and mitigated scenario at assessment years of various operation modes including, but not limited to,
  - (i) the worst operation mode which represents the maximum noise emission in connection of identified noise sources of the Project; and
  - (ii) any other operation modes as confirmed with the Director.
- (b) Validity of the above operational modes shall be confirmed with relevant departments/authorities and documented in the EIA report.

##### 4.3.2 *Prediction of Noise Impact*

- (a) The Applicant shall present the predicted noise levels in Leq (30 min) at the selected assessment points at various representative floor levels (in m P.D.) on tables and plans of suitable scale.
- (b) The assessment shall cover the cumulative fixed noise source impacts associated with the operation of the Project on existing, committed and planned NSRs within the assessment area.
- (c) The potential fixed noise source impacts under different scenarios shall be quantified by estimating the total number of dwellings, classrooms and other noise sensitive receivers that will be exposed to noise impacts exceeding the criteria set in Annex 5 in the TM.

#### 4.4 Mitigation of Fixed Noise Source Impact

##### *Direct Mitigation Measures*

Where the predicted fixed noise source impact exceeds the criteria set in Table 1A of Annex 5 of the TM, the Applicant shall consider and evaluate direct mitigation measures including but not limited to noise barrier/enclosure, screening by noise tolerant buildings, 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.

#### 4.5 Evaluation of Residual Fixed Noise Source Impact

Upon exhaust of direct mitigation measures, if the mitigated noise impact still exceeds the relevant criteria in Annex 5 of the TM, the Applicant shall identify, predict, evaluate the

residual fixed noise source impact in accordance with section 4.4.3 of the TM and estimate the total number of existing dwellings, classrooms and other noise sensitive elements that will be exposed to residual noise impacts exceeding the criteria set in Annex 5 in the TM.

## **5. Helicopter Noise Assessment**

### **5.1. Helicopter Noise Impact Assessment Methodology**

The Applicant shall propose methodology and computational model for agreement of the Director, with reference to section 4.4.2 of the TM, prior to the commencement of the assessment.

### **5.2. Identification of Helicopter Noise Impact**

#### **5.2.1. *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 helicopter noise impact shall include area of existing, committed and planned NSRs on the proposed Project under or near to the flight tracks in vicinity of the existing and planned helicopter pad(s).
- (b) The Applicant shall identify all existing, committed and planned NSRs on the proposed Project in the assessment area.
- (c) For planned noise sensitive land uses without committed site layouts, the Applicant should use the relevant land use and planning parameters and conditions to work out representative site layouts for helicopter noise assessment purpose. However, such parameters, conditions and site layouts together with any constraints identified shall be confirmed with the relevant responsible parties including Planning Department and Lands Department.

#### **5.2.2. *Inventory of Noise Sources***

- (a) The Applicant shall identify and quantify an inventory of noise sources for helicopter noise impact assessment. The inventory of noise sources shall include, but not limited to, helicopter noise characteristics (such as data representing noise emission and performance, etc.) for all potential helicopter operating at the existing and planned helicopter pad(s). The information of the helicopter noise characteristics shall be referred to a database accepted by recognized national/international organization, as agreed by the Director.
- (b) Validity of the above data shall be confirmed with relevant government departments/authorities and documented in the EIA report.

### **5.3. Prediction and Evaluation of Helicopter Noise Impact**

#### **5.3.1. *Scenarios***

- (a) The Applicant shall quantitatively assess the helicopter noise impact from the operation of the existing and planned helicopter pad(s) and related off site facilities during helicopters approaching and departure from the helicopter pad(s), with respect to the criteria set in Annex 5 of the TM, of unmitigated scenario and mitigated scenario at assessment years of various operation modes including, but not limited to,
  - (i) the worst operation mode which represents the maximum noise emission in connection of helicopter types, flight paths, flight frequency and flight hours, and;
  - (ii) any other operation modes as agreed by the Director.

- (b) Validity of the above operation modes shall be confirmed with relevant government/authorities and documented in the EIA report.

#### 5.3.2. *Prediction of Noise Impact*

- (a) The Applicant shall present the predicted helicopter noise impact in contours, with reference to criteria set in Annex 5 of the TM, including contours for each scenario assessed under various operation modes, on plans of suitable scale and documented in the EIA report. To determine the extent of the impacts, the Applicant shall provide maps at an adequately detailed scale (not less than 1:5000) to show the contours.
- (b) The assessment shall cover the cumulative helicopter noise impact associated with the operation of the existing and planned helicopter pad(s) and related off site facilities on existing, committed and planned NSRs within assessment area.
- (c) The potential helicopter noise impact under different scenarios and operation modes shall be quantified by estimating the total number of dwellings, classrooms and other noise sensitive receivers that will be exposed to noise impacts exceeding the criteria set in Annex 5 in the TM.

#### 5.4. Mitigation of Helicopter Noise Impact

##### *Direct Mitigation Measures*

Where the predicted helicopter noise impact exceeds the criteria set in Annex 5 of the TM, the Applicant shall consider and evaluate direct mitigation measures including but not limited to noise barrier/enclosure, screening by noise tolerant buildings, 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.

#### 5.5. Evaluation of Residual Helicopter Noise Impact

Upon exhaust of direct mitigation measures, if the mitigated noise impact still exceeds the relevant criteria in Annex 5 of the TM, the Applicant shall identify, predict and evaluate the residual helicopter noise impact in accordance with section 4.4.3 of the TM and estimate the total number of existing dwellings, classrooms and other noise sensitive elements that will be exposed to residual noise impact exceeding the criteria set in Annex 5 of the TM.

**Appendix D****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. Should quantitative assessment by mathematical modelling is necessary, the proposed modelling shall be approved by the Director before proceeding to modelling assessment.
3. The assessment shall include, but not be limited to the following:
  - (i) Should sewage treatment works be constructed under the proposed development, the analysis on operation arrangement of the plant with regard to the frequency, duration, volume and flow rate of the discharges, and their corresponding pollutants;
  - (ii) Should sewage pumping station or sewage treatment works be constructed under the proposed development, the water quality impacts of temporary and accidental discharges from the said facilities during the construction and operation phases of the Project to the surrounding water bodies such as Deep Bay Water Control Zone and other affected Water Control Zones;
  - (iii) Should sewage pumping station or sewage treatment works be constructed under the proposed development, the water quality impacts of chemical spillage during the construction and operation phases of the Project, in particular the accidental spillage associated with transfer and storage of chemicals, during the operation of the Project;
  - (iv) Should sewage treatment works be constructed with provision of co-digestion system with pre-treated organic waste, the water quality impacts during the receiving and co-digesting of organic waste;
  - (v) Potential hydrological impacts resulting from change in infiltration of rainfall; and
  - (vi) Potential water quality impacts resulting from the realignment works of Dongjiang water main (if applicable).
4. The Applicant shall address water quality impacts due to the construction phase and operation 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 and through appropriate site survey and tests when existing data are insufficient;



- (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 land use plans, including plans and drawings published by Lands Department and any land use and development applications approved by the Town Planning Board;
- (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, wetlands; change of water holding/flow regimes of water bodies, change in underground water table, change of catchment types or areas; erosion or sedimentation due to the Project and any other hydrological changes in the assessment 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;
- (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 of this EIA Study Brief;
- (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 of this EIA Study Brief. The water quality concerns shall include, but not limited to, possible sewage overflow or temporary/accidental 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) and its/their sensitive receivers due to those alternations and changes identified in (vi) above, and the pollution sources identified in (vii) above. The prediction shall take into account and include possible different construction and operation phases 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;

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- (xiv) develop effective infrastructure upgrading or provision, contingency plan, water pollution prevention and mitigation measures to be implemented during the construction and operation phases, including temporary/accidental sewage discharge in the case of sewage treatment works and sewage pumping station, so as to reduce the water quality impacts to within standards. Effluent generated from the Project shall require appropriate collection, treatment and disposal in considering the stressed condition within Deep Bay catchment. Requirements to be incorporated in the Project contract document shall also be proposed;
  - (xv) analyse the provision and adequacy of the existing, committed and planned future facilities to reduce pollution arising from the stormwater drainage system and surface water runoff during the construction and operation of the Project and associated works; establish a stormwater pollution control plan to minimize the potential water quality impacts from stormwater and non-point source pollution. The plan shall incorporate details such as locations, sizes and types of measures/installations and the best management practices;
  - (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;
  - (xvii) Should sewage treatment works be constructed under the proposed development, evaluate, predict and characterize the effluent characteristics of the Project with different levels of treatment and disinfection processes. The Applicant shall predict the effluent characteristics by making reference to the influent characteristics from both sewage and organic waste (if applicable), anticipated performance of the treatment and disinfection processes (if applicable) at the proposed sewage treatment works, the findings of previous studies, and conducting additional samplings and tests if needed; and
  - (xviii) Should sewage pumping station or sewage treatment works be constructed under the proposed development, recommend appropriate mitigation measures, including a contingency plan, to minimize the duration and impacts of temporary and accidental discharges during the operation stage of the Project.

**Appendix E**

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

1. The Applicant shall study and assess the impacts of discharging sewage to the existing/planned sewerage systems in North District. The assessment shall include the following:
  - (i) investigate and review to establish whether there is adequate capacity in the existing, committed and planned sewerage systems, and sewage treatment works in North District for the Project, in particular the Shek Wu Hui Sewage Treatment Works, taking into account the sewage arising from the existing sources, and committed and planned developments within the sewage catchment. The Applicant shall quantitatively address the impacts of the Maximum Development Flows on the sewerage system under different development phases. 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 future development under different phases on the existing and planned sewerage networks in North District;
  - (iii) propose and undertake all required measures to mitigate any forecast shortfalls in the sewerage system as a result of the Project under different development phases and demonstrate the proposed measures would be adequate for the Maximum Development Flows under different development phases. Any proposed sewerage system and/or on-site sewage treatment facility should be designed to meet the current government standards and requirements and agreed by DSD and EPD;
  - (iv) identify and quantify the water quality and ecological impacts due to the emergency discharge from on-site sewage treatment plant/pumping station, 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 North District, and investigate and assess the technical feasibility of connection (e.g. technical feasibility and details for connection to public sewer and sewage pumping station); and
  - (vi) set out the design, operation and maintenance requirements and undertake or obtain agreement to undertake the construction and maintenance of any proposed sewerage and sewage treatment facilities, such as pumping station and sewage treatment plant, including electrical and mechanical components to eliminate the problem of septicity incurred in long rising mains 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 F****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 wastes 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, floating refuse and other wastes which would be generated during the construction and operation phases.
- (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.

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 that can be taken in the planning and design stages e.g. by modifying the design approach and in the construction phase 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 the result of the assessment in section (iv) below.
- (iii) The EIA report shall state 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 wastes identified; and
- (iv) The impacts 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:
  - potential hazard;
  - air and odour emissions;
  - noise;
  - wastewater discharge;
  - ecology; and
  - public transport.

3. Excavation/Dredging, and Dumping

- (i) The Applicant shall identify and estimate dredging/excavation, dredged/excavated 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 characterise the sediment/mud concerned shall be conducted for marine disposal option. The ranges of parameters to be analysed; 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 document in the EIA report for consideration. The categories of sediment/mud which are to be disposed of in accordance with 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 contamination of sediment/mud which requires special treatment/disposal is confirmed, the Applicant shall identify the appropriate treatment and/or disposal arrangement and demonstrate its viability in consultation with relevant authorities.

- (ii) The Applicant shall identify and evaluate the practicable excavation/dredging methods to minimize excavation/dredging 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 G****Requirements for Land Contamination Assessment**

1. The Applicant shall identify the potential land contamination site(s) within the Project area (Appendix A refers) and, if any, within the boundaries of associated areas (e.g. work areas) of the Project.
2. 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).
3. 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 from sub-sections (i) to (iii) below and propose measures to avoid disposal -:
  - (i) 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). The CAP shall include 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).
  - (ii) 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 Remediation 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 approval. The Applicant shall then clean up the contaminated land or site(s) according to the approved 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 Project area. The CAP, CAR and RAP shall be documented in the EIA report.
  - (iii) 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.

**Requirements for Ecological Impact Assessment (Terrestrial and Aquatic)**

The ecological impact assessment shall include the following:

1. The Applicant shall examine the flora, fauna and other components of the ecological habitats within the assessment area. The aim shall be to protect, maintain or rehabilitate the natural environment. In particular, the Project shall avoid or minimize impacts on recognised sites of conservation importance and other ecologically sensitive areas and species of conservation importance. The assessment shall identify and quantify as far as possible the potential ecological impacts associated with the Project, both directly by loss of habitat, and indirectly by potential impacts such as human disturbance and/or change of water quality and/or hydrodynamic regime to natural environment, the associated wildlife groups/species and habitat connectivity between surrounding areas.
2. The assessment shall include the following major tasks:
  - (i) review the findings of relevant studies/surveys (including the approved EIA report of North East New Territories New Development Areas (Register no.: AEIAR-175/2013)) and collate the available information regarding the ecological characters of the assessment area, in particular the golf course site on which the potential development area is proposed and information on all habitats/species of conservation importance such as their occurrence, distribution and abundance;
  - (ii) evaluate the information collected, identify any information gap relating to the assessment of potential ecological impacts, and determine the ecological field surveys and investigations that are needed for an impact assessment as required in the following sections;
  - (iii) carry out necessary ecological field surveys with a duration of at least twelve (12) months covering the wet and dry seasons, and investigation to verify the information collected, fill the information gaps as identified in (ii) above, and to fulfil the objectives of the EIA study. The field surveys shall cover but not be limited to flora, fauna and any other habitats/species of conservation importance;
  - (iv) establish the ecological profile of the assessment area based on information collected in the tasks mentioned in sub-sections (i) to (iii) above, and describe the characteristics of each habitat found, the data set should be comprehensive and representative covering the variations of the wet and dry seasons, 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 ecologically sensitive areas, and assessment of whether these sites/areas will be affected by the Project;
    - (b) habitats maps of suitable scale (1:1000 to 1:5000) showing the types and locations of habitats and species of conservation importance in the assessment area;
    - (c) ecological characteristics of each habitat type such as size, vegetation and/or



- substrate type, species present, dominant species found, species diversity and abundance of major taxa groups, community structure, seasonal patterns, ecological value, inter-dependence of the habitats and species, and presence of any features of ecological importance;
- (d) representative colour photographs 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 importance, including but not limited to the following:
- (a) woodlands;
  - (b) natural and man-made wetland habitats including semi-natural/natural streams (both seasonal and non-seasonal), marshes, ponds and others, as well as the associated riparian habitats;
  - (c) roosting, breeding and/or feeding sites of resident and migratory birds, and mammals;
  - (d) flora (e.g. *Aquilaria sinensis*, *Aristolochia tagala*, *Glyptostrobus pensilis* and *Ardisia villosa*);
  - (e) vertebrates, including avifauna (including Eastern Cattle Egret), mammals (both terrestrial and flying, e.g. *Paguma larvata*, *Prionailurus bengalensis*, *Cynopterus sphinx*, *Tylonycteris pachypus* and *Scotophilus kuhlii*), and herpetofauna (e.g. *Mauremys reevesii* and *Enhydris chinensis*);
  - (f) stream fauna (e.g. *Somanniathelphusa zanklon*, *Channa asiatica*);
  - (g) macroinvertebrates, including butterflies (including *Troides helena*, *Pachliopta aristolochiae*, *Catochrysops strabo*, *Megisba malaya*), odonates and moths; and
  - (h) any other habitats and wildlife groups identified as having special conservation importance by the EIA study.
- (vi) describe recognised sites of conservation importance and other ecological sensitive areas within and in the vicinity of the assessment area and assess whether these sites will be affected by the Project;
- (vii) using suitable methodologies (including but not limited to those adopted in other relevant EIA studies in Hong Kong), 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), indirect (e.g. light pollution, changes in water qualities, hydrodynamics properties, hydrology, 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 direct loss of habitats, potential diversion or modification of stream courses, disturbance to wildlife, destruction of habitats, reduction of species abundance/diversity, loss of roosting, feeding and breeding grounds, reduction of ecological carrying capacity and habitat fragmentation and any other possible disturbance caused by the Project and the activities of the residents and visitors; and in particular the following:
- (a) ecological impacts of loss of habitats of conservation importance, in

- particular woodland, marshes, semi-natural/natural streams and ponds due to the construction of the Project;
- (b) noise, glare, dust, traffic and other human disturbance and other deterioration of environmental quality to ecological sensitive areas and wildlife during the construction and operation phases of the Project;
  - (c) indirect ecological impacts due to potential hydrological disruption and/or deterioration of the water quality in the marshes, semi-natural/natural streams, ponds or other wetland habitats in the assessment area due to drainage diversification works, surface runoff, drainage and effluent discharge, waste dumping/spillage, etc. during the construction and operation phases;
  - (d) indirect ecological impacts on Long Valley due to potential hydrological disruption, e.g. reduction in groundwater infiltration;
  - (e) potential impacts of future housing development and associated infrastructures on the flight path of breeding ardeids between breeding/roosting and foraging sites taking into account seasonal patterns during the construction and operation phases;
  - (f) impacts on birds due to collision to buildings and transparent or semi-transparent noise barriers;
  - (g) fragmentation of habitats on ecologically sensitive areas; and
  - (h) cumulative impacts due to other planned and committed development projects in or near the Project area.
- (viii) evaluate ecological impacts 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 operation phases of the Project;
- (ix) recommend possible and practicable mitigation measures (such as alternative design and configuration of the Project, modification/change of construction methods, restriction of building height, provision of buffer areas, etc.) to avoid, minimize and/or compensate for the adverse ecological impacts identified during the construction and operation phases of the Project;
- (x) evaluate the feasibility and effectiveness of the recommended mitigation measures and define the scope, type, location, implementation arrangement, resource requirement, subsequent management and maintenance of such measures;
- (xi) determine and quantify as far as possible the residual ecological impacts after implementation of the proposed mitigation measures;
- (xii) evaluate the significance 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 I**

**Requirements for Fisheries Impact Assessment**

1. The Applicant shall follow the criteria and guidelines for evaluating and assessing fisheries impacts as stated in Annexes 9 and 17 of the TM under EIA Ordinance.
2. The assessment area shall include all areas within a distance of 500 metres from the site boundaries of the Project. This assessment area shall be extended to include other areas if they are also found being impacted by the construction or operation of the Project during the course of the EIA study. Special attention should be given to fish pond culture resources and activities as well as any water courses which serve as water sources for fish ponds.
3. Existing information regarding the assessment area shall be reviewed. Based on the review results, the assessment shall identify any 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.
4. The assessment shall cover any potential impacts on culture fisheries during the construction and operation phases of the Project.
5. The fisheries impact assessment shall include the following major tasks:
  - (i) description of the physical environmental background;
  - (ii) description and quantification of the existing culture fisheries activities;
  - (iii) description and quantification of the existing culture fisheries resources;
  - (iv) identification of parameters (e.g. water quality parameters) and areas of culture fisheries importance;
  - (v) prediction and evaluation of any direct/indirect and on-site/off-site impacts on culture fisheries such as permanent loss or temporary occupation of fish ponds, deterioration of water quality in fish ponds and any surrounding water courses, hydrological disruptions and draw-down of water table, disruption or disturbance of pond culture related activities;
  - (vi) evaluation of cumulative impacts on culture fisheries particularly aquaculture sites and aquaculture production in the North District;
  - (vii) proposal of practicable alternatives or mitigation measures with details on justification, description of scope and programme feasibility as well as staff and financial implications including those related to subsequent management and maintenance requirements of the measures; and
  - (viii) review for the need of monitoring during construction and operation phases of the Project and, if necessary, proposal of a monitoring and audit programme.

**Appendix J****Requirements for Landscape and Visual Impact Assessment**

1. The Applicant shall review relevant plan(s) and conduct surveys/studies to identify existing sensitive landscape characters and landscape resources (including but not limited to Old and Valuable Tree (OVT), tree of large size, and protected/rare plant species such as *Aquilaria sinensis*), and recommend landscape areas of high landscape value as country park, coastal protection area, green belt, conservation area designations, watercourses and woodland areas. Any guidelines on landscape and urban design strategies and frameworks 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 the statutory town plan(s) and any published land use plans shall be highlighted and appropriate follow-up action shall be recommended. A system shall be derived for judging the landscape and visual impact significance as required under the Annexes 10 and 18 of the TM. Cumulative landscape and visual impacts of the Project with other existing, committed and planned developments in the assessment area shall be assessed.
2. The Applicant shall describe, appraise, analyse and evaluate the existing and planned landscape resources and character of the assessment area. A system shall be derived for judging landscape and visual impact significance. Annotated oblique aerial photographs and plans of suitable scale showing the baseline landscape character areas and landscape resources 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 sensitivity of the landscape framework and its ability to accommodate change shall be particularly focused on. The Applicant shall identify the degree of compatibility of the Project with the existing and planned landscape setting, recreation and tourism related uses, and scenic spot. The landscape impact assessment shall quantify the potential landscape impacts as far as possible so as to illustrate the significance of such impacts arising from the proposed development. Clear mapping of the landscape impacts is required. Broad brush tree and vegetation survey shall be carried out and the impacts on existing trees shall be addressed. Cumulative landscape and visual impacts of the Project with other committed and planned developments shall be assessed.
3. The Applicant shall assess the visual impacts of the Project. Clear illustration including mapping of visual impacts is required. The assessment shall mainly include the following:
  - (i) identification and plotting of visual envelope of the Project;
  - (ii) appraisal of existing visual resources and character as well as the future outlook of the visual system of the assessment area;
  - (iii) identification and justification of the key groups of existing and planned sensitive receivers within the visual envelope with regard to views from ground level, sea level and elevated vantage points, and clearly indicate the sensitive receivers on a plan of appropriate scale;
  - (iv) description of the visual compatibility of the Project with the surrounding and the planned setting, its obstruction and interference with the key views of the study areas, and changes in visual amenity;

- (v) identification and description of the severity of visual impacts in terms of distance, nature and number of sensitive receivers. The glare impacts of the Project shall be considered in the assessment. Assessment on effectiveness of the proposed mitigation measures of visual impacts during the construction and operation phases stages shall be carried out by comparing the impacts with and without mitigation measures; and
  - (vi) evaluation and explanation with supportive arguments of factors considered in arriving the significance thresholds of visual impacts. The visual impacts should include presentation of an evaluation matrix derived for judging impact significance.
4. In evaluation of the potential glare impacts due to man-made light sources generated from the Project and associated works and recommending practicable mitigation measures, reference could be made to “Charter on External Lighting” and “Guidelines on Industry Best Practices for External Lighting Installations” promulgated by the Environment Bureau.
  5. The Applicant shall evaluate the merits of preservation in totality, in parts or total destruction of existing landscape and the establishment of a new landscape character area. In addition, alternative location, layout, design, built-form and construction method that will avoid or reduce the identified landscape and visual impacts shall 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 existing landscape and visual quality. The Applicant shall recommend mitigation measures to minimize adverse effects identified above, including provision of a master landscape plan illustrating the landscape design and mitigation measures.
  6. The mitigation measures shall also include the preservation of vegetation and natural landscape resources, e.g. transplanting trees in good condition and value, provision of screen planting, re-vegetation of disturbed lands, compensatory planting, woodland restoration, peripheral landscape treatment to blend in with the surrounding environment, design of structures/chimneys, provision of finishes to structure, colour scheme and texture of material used and any measures to mitigate the impacts on the existing and planned land use and visually sensitive receivers. Parties shall be identified for the ongoing management and maintenance of the proposed mitigation works to ensure their effectiveness throughout the construction phase and operation phase of the Project, associated works, supporting facilities and essential infrastructures. A practical programme and funding proposal for the implementation, management and maintenance of the recommendation measures, and the parties responsible for all the mitigation measures from design stage to operation stage shall be provided.
  7. Annotated illustration materials such as colour perspective drawings, plans and section/elevation diagrams, annotated oblique aerial photographs, photographs taken at vantage points, and computer-generated photomontage shall be adopted to fully illustrate the landscape and visual impacts of the Project. In particular, the landscape and visual impacts of the Project with and without mitigation measures from representative viewpoints, particularly from views of the most severely affected visually sensitive receivers (i.e. worst case scenario), shall be properly illustrated in existing and planned setting at four stages (existing condition, Day 1 with no mitigation measures, Day 1 with mitigation measures and Year 10 with mitigation measures) by computer-generated photomontage so as to demonstrate the effectiveness of the proposed mitigation measures. Computer graphics shall

be compatible with Microstation DGN file format. The Applicant shall record the technical details in preparing the illustration, which may need to be submitted for verification of the accuracy of the illustration. If any noise barriers/enclosures are proposed, the choice of their colours, design and materials should be compatible with the surrounding buildings and development context and their aesthetic designs should be considered.

**Requirements for Cultural Heritage Impact Assessment**

1. **Built heritage impact assessment (BHIA)**

The Applicant shall conduct a built heritage impact assessment (BHIA), taking the results of the previous studies and other background of the site into account, to identify known and unknown built heritage items within the assessment area that may be affected by the Project and its associated works and to assess the direct and indirect impacts on built heritage items. The impacts include visual impacts, impacts on the fung shui/visual corridor of the historic buildings and structures through change of water-table, vibration caused by the Project. Assessment of impacts on cultural heritage shall also take full account of, and allow where appropriate, the Guidelines for Landscape and Visual Impact Assessment of Annex 18 of the TM. The Applicant shall demonstrate that all reasonable efforts have been made to avoid or keep the adverse impacts of built heritage items to the minimum through modification of design of the Project, or use of latest construction/engineering techniques. For those built heritage items that may still be directly and indirectly affected by the Project, the Applicant shall recommend practicable mitigation measures and monitoring to avoid or keep the adverse impacts to the minimum. A checklist including all the affected sites of cultural heritage, impacts identified, recommended mitigation measures as well as the implementation agent and period shall also be included in the EIA report.

2. **Archaeological impact assessment (AIA)**

The Applicant shall engage qualified archaeologist(s) to conduct an archaeological impact assessment (AIA), taking the results of previous studies and other background of the site into account, to evaluate the archaeological impacts imposed by the Project and its associated works. The scope of the AIA baseline study consisting of desk-top research and field evaluation (if found necessary), shall be submitted to the Director prior to the commencement of the assessment for consideration. In case the existing information is inadequate or where the assessment area has not been adequately studied before, the archaeologists shall conduct archaeological survey to assemble data. The archaeologists shall obtain licences from the Antiquities Authority prior to the commencement of archaeological survey. Based on existing and collected data, the Applicant shall evaluate whether the proposed developments and works associated with the Project are acceptable from archaeological preservation point of view. In case adverse impacts on archaeological heritage cannot be avoided, appropriate mitigation measures should be designed and recommended in the EIA report. If archaeological survey is required, it shall follow detailed technical requirements to be given by the Director on archaeological survey, archaeological report and handling of archaeological finds and archives.

3. The Applicant shall draw necessary reference to relevant sections of the “Guidelines for Cultural Heritage Impact Assessment” issued by the Antiquities and Monuments Office, including those on archaeological survey, archaeological report, and handling of archaeological finds and archives, if found necessary in desk-top research results.

**Appendix L**

**Implementation Schedule of Recommended Mitigation Measures**

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Measures & Main Concerns to Address	Who to implement the measure?	Location of the measure	When to implement the measure?	What standards or requirements for the measure to achieve?



**Appendix M**

**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 30 copies of the bilingual (in both English and Chinese) executive summary 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 bilingual (in both English and Chinese) executive summary 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. To facilitate public inspection of EIA report via EIAO Internet Website, the Applicant shall provide electronic copies of both the EIA report and the executive summary prepared in HyperText Markup Language (HTML) and in Portable Document Format (PDF), unless otherwise agreed by the Director. For both of the HTML and PDF versions, a content page capable of providing hyperlink to each section and sub-section of the EIA report and the executive summary shall be included in the beginning of the document. Hyperlinks to figures, drawings and tables in the EIA report and the executive summary shall be provided in the main text from where respective references are made. The EIA report, including drawings, tables, figures and appendices shall be viewable by common web-browsers including Internet Explorer 8, Firefox 23, Chrome and Safari 8 or later versions as agreed by the Director, and support languages including Traditional Chinese, Simplified Chinese and English.
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.