本署檔號
OUR REF: (35) in EP2/N9/A/189
來函檔號
YOUR REF:
電　　話
TEL. NO.: 2835 1105
圖文傳真
FAX NO.: 2591 0558
電子郵件
E-MAIL:
網　　址
HOMEPAGE: http://www.epd.gov.hk

Environmental Protection Department
Branch Office
28th Floor, Southorn Centre,
130 Hennessy Road,
Wan Chai, Hong Kong.

環境保護署分處
香港灣仔
軒尼詩道
一百三十號
修頓中心廿八樓

27 January 2021

By Registered Post & By Fax

Sustainable Lantau Office,
Civil Engineering and Development Department,

Dear

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

Project Title: Road P1 (Tai Ho – Sunny Bay Section), Lantau
(Application No. ESB-337/2020)

I refer to your above application received on 18 December 2020 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-337/2020) for your preparation of an EIA report.

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

You may submit an application for approval of the EIA report in accordance with Section 6(2) of the EIA Ordinance after its completion. Upon receipt of your application, this department will decide under Section 6(3) of the EIA Ordinance whether the EIA report meets the requirements of the EIA Study Brief and Technical Memorandum on EIA Process, and accordingly advise you under Section 6(4) of the EIA Ordinance whether a submission to the Advisory Council on the Environment (ACE) or its subcommittee is required. In this connection, you are required to provide sufficient copies of the Executive Summary of the EIA report to the Secretariat of the EIA Subcommittee of the Council for selection for submission when you submit the EIA report to this department for approval. Please liaise with Ms. 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 Ms. Marlene HO at 2835 1751.

Yours sincerely,

(Victor W.T. YEUNG)
Acting Principal Environmental Protection Officer
for Director of Environmental Protection

Encl.

c.c. (w/o encl.)
ACE EIA Subcommittee Secretariat (Attn. : Ms. Becky LAM) Fax: 2872 0603

Environmental Impact Assessment Ordinance (Cap. 499), Section 5 (7)

Environmental Impact Assessment study brief No. ESB-337/2020

Project Title: Road P1 (Tai Ho – Sunny Bay Section), Lantau
(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-337/2020) for an Environmental Impact Assessment (EIA) study brief under section 5(1)(a) of the Environmental Impact Assessment Ordinance (EIAO) was submitted by the captioned Applicant on 18 December 2020 with a project profile (No. PP-615/2020) (the Project Profile).

1.2 The Project is to construct and operate the Road P1 (Tai Ho – Sunny Bay Section) (the Project), a dual two-lane highway parallel to the North Lantau Highway (NLH) connecting Tai Ho Interchange and Sunny Bay. The location of the Project is shown in **Appendix A** and the scope of works comprises:-

(i) construction of a dual 2-lane carriageway of about 9.5 km long with slip roads at appropriate locations to connect with the NLH near the Penny Bay Highway, the Sunny Bay and the proposed Route 11, in the form of elevated or at-grade road which extends from the Tai Ho Interchange to Sunny Bay;

(ii) construction of a dual 2-lane tunnel of about 1 km long between Ta Pang Po and Yan O Wan, and the associated tunnel portal, administration building and ventilation facilities;

(iii) reclamation works of about 15 hectares between Tai Ho Interchange and Sham Shui Kok;

(iv) widening the westbound carriageway of NLH from 3-lanes to 4-lanes between the Sunny Bay Interchange and the Lantau Link Toll Plaza;

(v) construction of cycle tracks and walkways along appropriate road section(s) between Tai Ho Interchange and Sunny Bay; and

(vi) the associated building, civil, structural, geotechnical, marine, electrical and mechanical, landscaping, environmental protection and mitigation works, drainage and sewerage works, waterworks, utilities and other works associated with the Project.

1.3 Based on the information provided in the Project Profile, the Project will comprise the following designated projects:

(i) Items A.1, Part I, Schedule 2 of the EIAO – "*A road which is an expressway, trunk road, primary distributor road or district distributor road including new roads, and major extensions or improvements to existing road*s";

(ii) Item A.7, Part I, Schedule 2 of the EIAO – "*A road or railway tunnel more than 800 m in length between portals*";

(iii) Item A.8, Part I, Schedule 2 of the EIAO – "*A road or railway bridge more than 100 m in length between abutments*";

(iv) Item C.1, Part I, Schedule 2 of the EIAO – "*Reclamation works (including associated dredging works) more than 5 ha in size*";

(v) Item C.2 (a) (iv), Part I, Schedule 2 of the EIAO – "*Reclamation works (including associated dredging works) more than 1 ha in size and a boundary of which is less than 500 m from the nearest boundary of an existing or planned marine park*".

1.4 Pursuant to section 5(7)(a) of the EIAO, the Director of Environmental Protection (the Director) issues this EIA study brief to the Applicant to carry out an EIA study.

1.5 The purpose of this EIA study is to provide information on the nature and extent of environmental impacts arising from the construction and operation of the Project and associated works that will take place concurrently. This information will contribute to decisions by the Director on:

(i) the overall acceptability of any adverse environmental consequences that are likely to arise as a result of the Project;

(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 potential waste management issues and impacts arising as a result of the construction and operation activities of the Project;

(v) to identify and quantify contaminated land within any Project area for development works, and to proposed measures to avoid disposal in the first instance;

(vi) to identify and quantify any potential losses or damage to flora, fauna and natural habitats, and to propose measures to mitigate these impacts;

(vii) to identify potential hazard to life impacts and to propose mitigation measures to mitigate these impacts;

(viii) to identify any potential landscape and visual impacts and to propose measures to mitigate these impacts;

(ix) to identify any adverse impacts on cultural heritage and to propose measures to mitigate these impacts;

(x) to propose the provision of infrastructure or mitigation measures so as to minimise pollution, environmental disturbance and nuisance during construction and operation of the Project;

(xi) to investigate the feasibility, effectiveness and implications of the proposed mitigation measures;

(xii) 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;

(xiii) 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;

(xiv) to design and specify the environmental monitoring and audit requirements; and

(xv) to identify any additional studies necessary to implement the mitigation measures or monitoring and proposals recommended in the EIA Report.

3. DETAILED REQUIREMENTS OF THE EIA STUDY

3.1 The Purpose

3.1.1 The purpose of this EIA 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 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 section 1.2 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 development options, alignments, design and construction methods/phasing of the Project with a view to deriving the preferred development option(s) that will avoid or minimise

adverse environmental impact. In particular the issues of minimisation of the reclamation extent for the Project and enhancing public enjoyment of the waterfront should be covered taking into account the latest development of interfacing projects in the vicinity of the Project area including the proposed alignment of Road P1 (Tung Chung – Tai Ho Section), the potential Sunny Bay Development, the proposed Siu Ho Wan (SHW) Station and SHW Depot Replanning, and the proposed Comprehensive Residential and Commercial Development atop SHW Depot and the proposed Route 11;

(ii) potential air quality impacts on air sensitive receivers (ASRs) due to the construction and operation of the Project;

(iii) potential noise impacts on noise sensitive receivers (NSRs) due to the construction and operation of the Project;

(iv) potential water quality impacts on water sensitive receivers (WSRs) and the relevant water system(s) in the vicinity including The Brothers Marine Park, Ma Wan Fish Culture Zone, Yan O Wan, Tai Ho Wan due to the construction and operation of the Project;

(v) potential ecological impacts due to the construction and operation of the Project, in particular impacts on the Chinese White Dolphins habitats, The Brothers Marine Park, Yan O Wan, Tai Ho Stream SSSI and Tai Ho Wan, coral communities in the vicinity of the Project and any other sensitive areas that may be identified during the course of the EIA study;

(vi) potential fisheries impacts on fishing and aquaculture activities, fisheries resources and habitats, and aquaculture sites arising from the construction and operation of the Project;

(vii) potential cultural heritage impacts including marine archaeological impacts due to the construction and operation of the Project;

(viii) potential landscape and visual impacts due to the construction and operation of the Project, in particular the impact to the rural landscape around Yan O Wan;

(ix) potential waste management implications arising from the construction and operation of the Project;

(x) potential extent of land contamination within the Project area for development works and relevant mitigation measures;

(xi) potential hazard to life impact on the Project's workforce and future users of the proposed road, cycle tracks and walkways due to the potential risk associated with the dangerous goods facilities within the Siu Ho Wan Water Treatment Works (SHW WTW), Organic Resources Recovery Centre Phase I (ORRC1) and Sham Shui Kok Transshipment Dock (SSK Dock) in the vicinity as well as the potential hazard to life impacts on the surrounding populations due to the storage, transport and use of explosives during the construction of the Project ;

(xii) potential cumulative environmental impacts of the Project, through interaction or in combination with other existing, committed and planned developments in the vicinity of the Project, and that those impacts may have a bearing on the environmental acceptability of the Project. Consideration shall be given to account for impacts from likely concurrent projects, in particular, the potential

Sunny Bay Development, the proposed Route 11, and the proposed Siu Ho Wan Station and Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot; and

(xiii) potential interfacing and implications of the planned Sunny Bay Development and Route 11 projects upon the scope and details of this Project including the proposed reclamation extent, alignment, construction method, the implementation programme, and the associated environmental impacts of this Project.

3.3 Description of the Project

3.3.1 Purpose(s) and Objectives of the Project

The Applicant shall provide information on the Project, including the purpose, objectives and environmental benefits of the Project, and describe the 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 the proposed siting, design, reclamation extent methods and sequence of construction works and other major activities involved in the construction and operation phases of the Project, using diagrams, plans and/or maps as necessary. The estimated duration of the construction phase of the Project together with the programme within these phases, where appropriate, shall be given. The waters and/or land taken by the Project site(s), construction sites and any associated access arrangements and auxiliary facilities shall be shown on a scaled map. The uses of the Project shall be described and the different waters and/or land use areas shall be demarcated as appropriate.

3.3.3 Background and History of the Project

The Applicant shall provide information on the site location and site history of the Project, interactions with other projects, and the consideration of different development options, taking into account the principles of avoidance, minimizing and control of adverse environmental impacts. Where relevant, the interfacing with other planned projects such as Route 11 and Sunny Bay Development should be taken into account. The options might include vertical and horizontal alignment, reclamation size, siting of tunnel portal and the associated facilities, and off-site works area(s) if any, design, construction methods, sequence/phasing of construction works, and access arrangements for the Project, and the feasibility to avoid or reduce reclamation in particular in area in the vicinity of The Brothers Marine Park, and the opportunity to enhance the connectivity to the waterfront from the future SHW atop development and SHW station. The key reasons for selecting the preferred development option(s) and the part environmental factors played in the selection shall be described. The main environmental impacts of different development options and siting shall be compared with those of the Project and with the likely future environmental conditions in the absence of the Project.

3.4 Technical Requirements

3.4.1 The Applicant shall conduct the EIA study to address 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.

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

3.4.4 Air Quality Impact

3.4.4.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing the air quality impacts arising from the construction and operation of the Project as stated in Annexes 4 and 12 of the TM, respectively.

3.4.4.2 The assessment area for 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 within the Study Area as identified in the EIA study, 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 areas where the 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. The assessment shall also take into account the impacts of emission sources from nearby concurrent projects, if any.

3.4.4.3 The air quality impact assessment for construction and operation of the Project shall follow the detailed technical requirements given at **Appendices B** and **B-1**.

3.4.5 Noise Impact

3.4.5.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing noise impact arising from the construction and operation of the Project as stated in Annexes 5 and 13 of the TM, respectively.

3.4.5.2 Assessment shall include construction noise, road traffic noise and fixed noise sources impact assessment of the existing, committed and planned 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.

3.4.5.3 The noise impact assessment for construction and operation of the Project shall follow the detailed technical requirements given at **Appendix C**.

3.4.6 **Water Quality Impact**

3.4.6.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing water pollution arising from the construction and operation of the Project as stated in Annexes 6 and 14 of the TM respectively.

3.4.6.2 The assessment area for the water quality impact assessment shall include areas within 500 meters from the boundary of the Project and shall cover the North Western Water Control Zone, Western Buffer Water Control Zone as designated under the Water Pollution Control Ordinance (Cap. 358) and the 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 affected by the project during the course of the EIA study and have a bearing on the environmental acceptability of the Project. The water quality impact assessment for construction and operation of the Project shall follow the detailed technical requirements given in **Appendices D** and **D-1**.

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 arising from the construction and operation of the Project as stated in Annexes 7 and 15 of the TM, respectively.

3.4.7.2 The assessment of waste management implications arising from construction and operation of the Project shall follow the detailed technical requirements given at **Appendix E**.

3.4.8 **Land Contamination**

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

3.4.8.2 The assessment of the potential land contamination issue(s) shall follow the detailed technical requirements given in **Appendix F**.

3.4.9 **Ecological Impact**

3.4.9.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing ecological impact for both terrestrial and marine ecology arising from the construction and operation of the Project as stated in Annexes 8 and 16 of the TM.

3.4.9.2 The assessment area for the purpose of the terrestrial ecological impact assessment shall include areas within 500 metres from the boundary of the Project Area and the works areas of the Project as well as any other areas likely to be impacted by the Project. For marine ecological impact assessment, the assessment area shall be the same as the assessment area for water quality impact assessment described in 3.4.6.2 of this EIA study brief.

3.4.9.3 The ecological impact assessment for the construction and operation of the Project shall follow the detailed technical requirements given in **Appendix G**.

3.4.10 **Fisheries Impact**

3.4.10.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing fisheries impact arising from the construction and operation of the Project as stated in Annexes 9 and 17 of the TM.

3.4.10.2 The assessment area shall be the same as the assessment area for water quality impact assessment described in Section 3.4.6.2 of this EIA study brief. 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 loss or disturbance of fishing ground, water quality deterioration at sensitive receivers such as Fish Culture Zones, spawning and nursery ground of commercial fisheries resources in the western waters of Hong Kong.

3.4.10.3 The fisheries impact assessment for construction and operation of the Project shall follow the detailed technical requirements given in **Appendix H**.

3.4.11 **Impact on Cultural Heritage**

3.4.11.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing the cultural heritage impacts as stated in Annexes 10 and 19 of the TM respectively.

3.4.11.2 The assessment area for the cultural heritage impact assessment (CHIA) shall be defined by a distance of 300 metres from the boundary of the Project area. The CHIA shall include a Built Heritage Impact Assessment (BHIA), an Archaeological Impact Assessment (AIA) and a Marine Archaeological Investigation (MAI). It shall follow the detailed technical requirements given in **Appendix I**.

3.4.12 **Hazard To Life**

3.4.12.1 The Applicant shall follow the criteria for evaluating hazard to life arising from the construction and operation of the Project as stated in Annex 4 of the TM. The Applicant shall identify and assess hazard issues on dangerous goods related to the Project.

3.4.12.2 The hazard to life assessment shall be carried out to address the risk associated with the storage, transport and use of explosives for the construction activities and the risk associated with the dangerous goods facilities within the Siu Ho Wan Water Treatment Works, Organic Resource Recovery Centre Phase 1 and Sham Shui Kok Transshipment Dock. The hazard to life assessment for construction and operation phases of the Project shall follow the detailed technical requirements given in **Appendix J**.

3.4.13 **Landscape and Visual Impact**

3.4.13.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing landscape and visual impacts arising from the construction and operation of the Project as stated in Annexes 10 and 18 of the TM, and the EIAO Guidance Note No. 8/2010 “Preparation of Landscape and Visual Impact Assessment under the EIAO”.

3.4.13.2 The assessment area for the landscape impact assessment shall include areas within 100 metres from the boundary of the Project, while the assessment area for the visual impact assessment shall be defined by the visual envelope of the Project. The defined visual envelope shall be shown on a plan in the EIA report.

3.4.13.3 The landscape and visual impact assessment for the construction and operation of the Project shall follow the detailed technical requirements given in **Appendix K**.

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 operational 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, key environmental problems avoided, compensation areas included and the environmental benefits of environmental protection measures recommended.

3.6.2 Summary of Environmental Impacts

To facilitate 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 exceedance predicted, impact avoidance measures considered, mitigation measures proposed and residual impacts (after mitigation). This summary shall over 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 , 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 components. The proposed use of any alternative assessment tool(s) or assumption(s) have to be justified by the Applicant, with supporting documents based on cogent, scientific and objectively derived reason(s) before seeking the Director's agreement. The supporting documents shall be provided in the EIA report.

3.6.4 Summary of Alternative Mitigation Measures

The EIA report shall contain a summary of alternative development options and measures considered during the course of EIA study, including design, scale, reclamation extent, layout, siting, alignment as well as construction methods, disposal and treatment method and sequences of works for the Project, with a view to avoiding, minimising and mitigating adverse environmental impacts. A comparison of the environmental benefits and dis-benefits of applying different development options, and mitigation options 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 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 visualisations of the key findings of the EIA report so that the public can better understand the Project and the associated environmental issues. The EIA findings to be included in the 3-dimensional presentation shall be agreed with EPD and may include baseline environmental information, the environmental situations with or without the Project including associated works, supporting facilities and essential infrastructures; key mitigated and unmitigated environmental impacts; key recommended environmental mitigation measures. The visualisations shall be based on the EIA report findings and 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 visualisations (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 visualisations 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 Section 1.2 of this EIA study brief and in Project Profile (No. PP-615/2020), 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

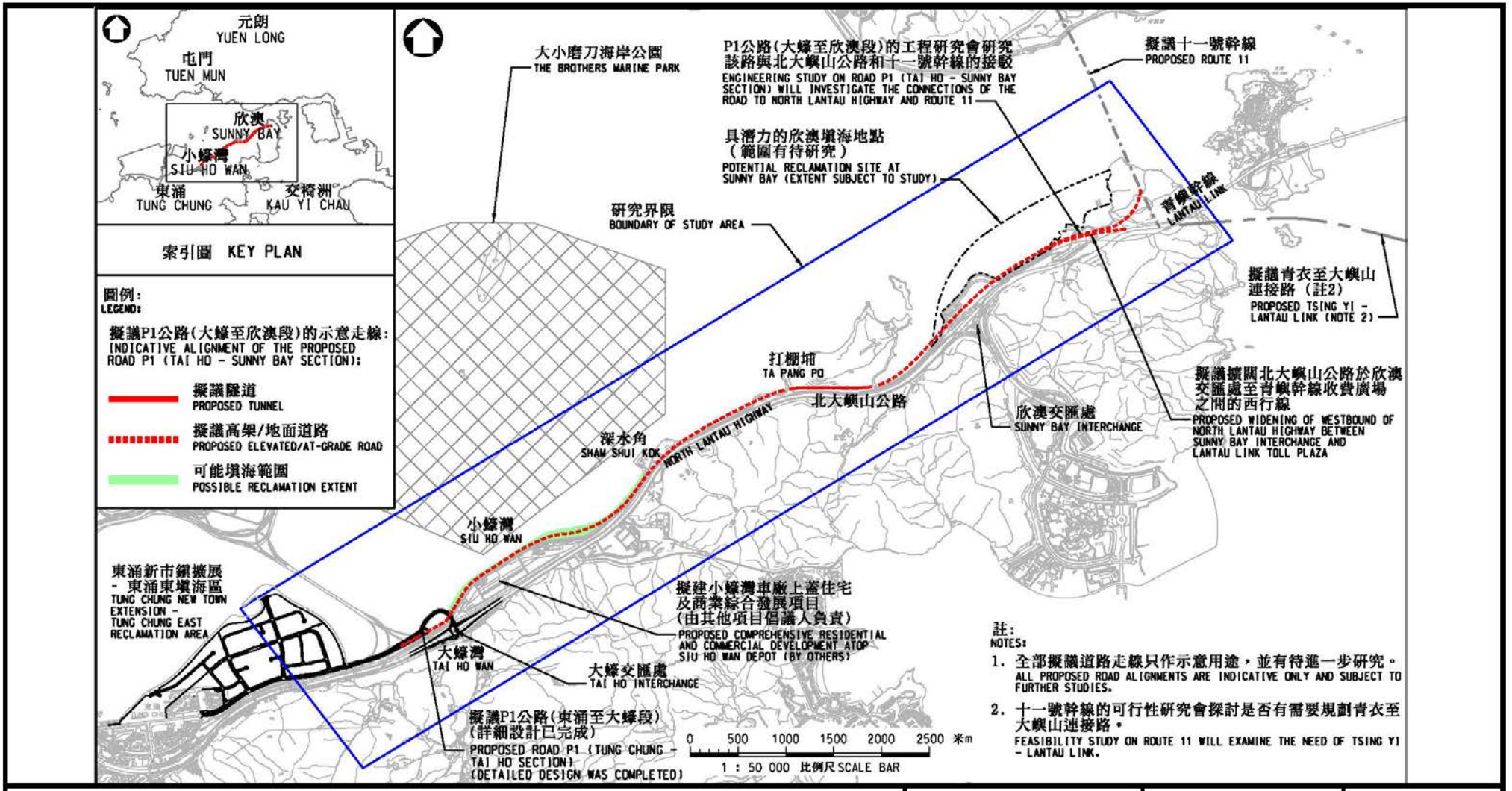
7.1 This EIA study brief includes the following appendices:

Appendix A - Project 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 D-1 - Hydrodynamic and Water Quality Modelling Requirements
Appendix E - Requirements for Assessment of Waste Management Implications
Appendix F - Requirements for Land Contamination Assessment
Appendix G - Requirements for Ecological Impact Assessment
Appendix H - Requirements for Fisheries Impact Assessment
Appendix I - Requirements for Cultural Heritage Impact Assessment
Appendix J - Requirements for Hazard to Life Assessment
Appendix K - Requirements for Landscape and Visual Impact Assessment
Appendix L - Implementation Schedule of Recommended Mitigation Measures
Appendix M - Requirements for EIA Report Documents

--- END OF EIA STUDY BRIEF ---

January 2021
Environmental Assessment Division,
Environmental Protection Department

Appendix A



Project Title: Road P1 (Tai Ho – Sunny Bay Section), Lantau
工程項目名稱：大嶼山P1公路(大蠔至欣澳段)

(This figure is prepared based on Figure 1 of Project Profile No.: PP-615/2020)
(本圖是根據工程項目簡介 PP-615/2020 圖則編號 1 編製)

EIA Study Brief No. :
環評研究概要編號 :
ESB-337/2020

Appendix A: Project Location Plan
附錄A: 工程項目位置圖

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 operational stages of the Project.

(ii) Provision of an account, where appropriate, of the consideration/measures that have been taken into consideration in the planning of the project to avoid and minimise the air pollution impact. The Applicant shall consider alternative construction methods, phasing programmes and alternative modes of operation to minimise the air quality impact during construction and operational stages of the Project.

(iii) Presentation of background air quality levels in the assessment area for the purpose of evaluating cumulative air quality impacts during construction and operational stages of the Project. Projection of future year background air quality can be extracted from the "Pollutants in the Atmosphere and their Transport over Hong Kong" (PATH) model released by the Director. If a modification to the emission sources is to be adopted in the PATH model to update the projection of future year background air quality, details of the emission sources adopted in the modification 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.

(ii) Provision of a list of air pollutant 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. Confirmation regarding the validity of assumptions and the magnitude of activities (e.g. volume of construction material to be handled, traffic forecast data etc.) shall be obtained from the relevant government departments/authorities, where applicable, and documented in the EIA Report.

(iii) Identification of 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 impact 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 shall be assessed, based on the best information available at the time of assessment.

3. Construction Phase Air Quality Impact

(i) The Applicant shall follow the requirements stipulated under the Air Pollution Control (Construction Dust) Regulation to ensure that construction dust impacts are controlled within the relevant standards as stipulated in section 1 of Annex 4 of the TM.

(ii) If the Applicant anticipates that the Project will give rise to significant construction dust impacts likely to exceed recommended limits in the TM at the ASRs despite the incorporation of the dust control measures proposed, a quantitative assessment shall be carried out to evaluate the construction dust impact at the identified ASRs. The Applicant shall follow the methodology set out in section 5 below when carrying out the quantitative assessment.

(iii) Where necessary, the Applicant shall consider and evaluate direct mitigation measures, including but not limited to water-spraying, re-scheduling construction programme to minimise concurrent dust impact arising from different construction sites, for fugitive dust control. The Applicant shall also consider connecting construction plant and equipment to mains electricity supply and avoid use of diesel generators and diesel-powered equipment as far as practicable to minimize air quality impact arising from these equipment. 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 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 quality impact at the identified ASRs based on an assumed reasonably worst-case scenario under normal operating conditions of the Project. If the assessment indicates likely exceedances of the recommended limits in the TM at the identified ASRs, a quantitative assessment should be carried out to evaluate the operational phase air quality impacts at the identified ASRs. The Applicant shall follow the methodology set out in section 5 below when carrying out the quantitative assessment.

(ii) 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 the 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 associated 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 the 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 impact 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.

(iv) For operational phase assessment, the air pollution impacts of future road traffic shall be calculated based on the highest emission strength from the road vehicles in the assessment area within the next 15 years upon commencement of operation of the proposed road. 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. For construction phase assessment, the Applicant shall demonstrate the use of the emission data of the future road traffic represents the highest emission scenario within the construction phase concerned. The Applicant may use EMFAC-HK model released by the Director to determine the Fleet Average Emission Factors, taking into account vehicle fleet mix and other necessary data on each road section. 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. Vehicle emissions, including running, start/idling emission, at parking sites that would contribute significantly to the overall cumulative air quality impact at nearby ASRs shall be taken into account in the assessment. The traffic forecast data and assumptions, such as the hourly traffic volume, average speed, vehicle composition and number of trips data and the exhaust technology fractions, vehicle age/population distribution, etc. that are used in the assessment shall be presented.

(v) Emissions from road traffic, marine traffic, airport, other industrial sources and nearby concurrent projects within the assessment area, which contribute to the cumulative air quality impact of the identified ASRs, should be taken into

account and be included in the appropriate air quality models accepted by the Director.

(vi) For projection of future background air quality, the Applicant may use the PATH model released by the Director, 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. If any modification is made to the emission sources in PATH model or an alternative model is used, details of the emission sources adopted should be clearly presented. In general, major point sources located within 4 km from the identified ASRs shall be reviewed if they have direct contributions of air quality impacts to the ASRs on the concerned pollutants of the assessment. In such case, these point sources shall be simulated by dispersion model to account for their induced sub-grid scale spatial variations in background air quality. The exact approach shall be determined according to the case specific situation and subject to the agreement by the Director.

(vii) The Applicant shall calculate the cumulative air quality impact 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 impact at the identified ASRs arising from the Project. The predicted air quality impacts (both unmitigated and mitigated) shall be presented in the form of summary table(s) and pollution contours, to be evaluated against the relevant air quality standards and on any effect they may have on the land use implications. Plans of a suitable scale 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 impact due to emissions from tunnels/full enclosures, the Applicant shall ensure prior agreement with the relevant ventilation design engineer over the amount and the types/kinds of pollutants emitted from these full enclosures; and such assumptions shall be clearly and properly documented in the EIA Report.

(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 scenario, due to these technical remedies shall be assessed. For instance, if barriers that may affect dispersion of air pollutants are proposed, then the implications of such remedies on air quality impact shall be assessed. If noise enclosure is proposed, then portal emissions of the enclosed road section shall be assessed. 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 impact 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

(i) 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 impact in accordance with Section 4.4.3 and section 4.5.1(d) of 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.

Appendix B-1

Air Quality Modelling Guidelines

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

Air quality modelling guidelines refer to the guidelines published on the website of the Environmental Protection Department:

http://www.epd.gov.hk/epd/english/environmentinhk/air/guide_ref/guide_aqa_model.html

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 source. 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 paragraphs 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 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 impact resulting from the construction works of the Project and other concurrent projects identified during the course of the EIA study on existing NSRs within the assessment area.

(c) The potential construction noise impact 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 impact 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, 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 maximise 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 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.

2.6 Construction Noise Impact Monitoring and Audit

The Applicant shall, with reference to Section 8 and Annex 21 of the TM, propose a construction noise management plan so that both the verification of the inventory of noise sources, and the assessment of the effectiveness and practicality of all identified measures for mitigating the construction noise impact of the Project, would be performed during the design, tendering and implementation stage of the construction works.

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 paragraphs 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 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 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 landuse and planning parameters and conditions to work out representative site layouts for road traffic noise impact assessment purpose. However, such parameters and conditions 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 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.

(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 impact of the Project, with respect to the criteria set in Annex 5, 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 provide the input data sets of traffic noise model prediction model adopted in the EIA study as requested by the Director for the following scenarios:

(c) unmitigated scenario at assessment year;

(d) mitigated scenario at assessment year; and

(e) 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 impact 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 impact 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 impact exceeding the criteria set in Annex 5 in the TM.

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, 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 maximise 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 planned noise sensitive uses which will still be affected even with practicable direct mitigation measures 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 of relevant parties.

(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, 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 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 recognised national/international organisation 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 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 paragraph 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 landuse and planning parameters and conditions to work out representative site layouts for fixed noise sources assessment purpose. However, such parameters and conditions 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 ventilation system(s) of building(s) and/or tunnel(s), ventilation shafts of railway, sewage pumping station(s), sewage treatment works, district cooling water system and electricity substation(s), etc.

(b) The Applicant shall provide document or certificate, accepted by recognised national/international organisation, 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 Sources Impact

4.3.1 Scenarios

(a) The Applicant shall quantitatively assess the fixed noise sources 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 sources impact associated with the operation of the proposed project on existing, committed and planned NSRs within the assessment area.

(c) The potential fixed noise sources impact 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 impact exceeding the criteria set in Annex 5 in the TM.

4.4 Mitigation of Fixed Noise Sources Impact

4.4.1 Direct Mitigation Measures

Where the predicted fixed noise sources impact exceeds the criteria set in Table 1A of Annex 5, 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 maximise 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 Sources Impact

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

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 by appropriate mathematical modelling and/or other techniques proposed by the Applicant and approved by the Director. The mathematical modelling requirements are set out in **Appendix D-1**. Possible impacts due to the dredging, filling, transportation and disposal of dredged materials, other marine works activities, effluent discharge and site runoff shall include changes in hydrology, flow regime, sediment erosion and deposition patterns, morphological change of seabed profile, water and sediment quality. The prediction shall include possible different construction stages or sequences of the Project. Affected sensitive receivers shall be identified by the assessment tool with indications of degree of severity.

3. The assessment shall include, but not limited to the following:

   (i) the water quality impacts of marine works, the site run-off such as the effluents generated from dewatering associated with tunneling and piling activities and those specified in the ProPECC Practice Note 1/94 during the construction phase;

   (ii) the water quality impacts of the road runoff containing oil/grease and suspended solids, wastewater generated from facilities and sewage generated from the workforce during the operational stage;

   (iii) the water quality impacts on The Brothers Marine Park, beaches, seawater intake points, water courses, drainages and other water sensitive receivers around the work sites.

4. The Applicant shall address water quality impacts due to the construction phase and operational phases 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) characterise water quality of the water systems and sensitive receivers, which might be affected by the Project based on existing best available information or through appropriate site survey and tests;

   (iii) identify and analyse relevant existing and planned future activities, beneficial uses and water sensitive receivers related to the affected water system(s). The Applicant should refer to, inter alia, those developments and uses earmarked on the relevant Outline Zoning Plans, Development Permission Area Plans, Outline Development Plans and Layout Plans, and any other relevant published landuse plans;

   (iv) identify pertinent water quality objectives and establish other appropriate water quality criteria or standards for the water system(s) and the sensitive receivers identified in (i), (ii) & (iii) above;

(v) review the specific construction methods and configurations, and operation of the Project to identify and predict the likely water quality impacts arising from the Project;

(vi) identify any alteration of any drainage systems, outfalls, water courses, natural streams, ponds, change of water holding/flow regimes of water bodies, change of catchment types or areas; erosion or sedimentation due to the Project and any other hydrological changes in the Study Area;

(vii) identify and quantify existing and likely future water pollution sources, including point discharges and non-point sources discharges to the water systems, sewage and wastewater generated from the construction and operation of the Project, contaminant release from works on marine sediment and sediment release or re-suspension from works into water bodies;

(viii) provide an emission inventory on the quantities and characteristics of those existing and future pollution sources in the Study Area. Field investigation and laboratory test, shall be conducted as appropriate to fill relevant information gaps;

(ix) predict and quantify the impacts on the water system(s) and their sensitive receivers due to the alterations, changes and the pollution sources identified above. Possible impacts include change in hydrology, flow regime, water quality and release of contaminants during marine works, etc. The prediction shall take into account and include possible different construction and operation stages of the Project;

(x) 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;

(xi) analyze the provision and adequacy of existing and planned future facilities to handle or reduce pollution arising from the point and non-point sources identified in (vii) above;

(xii) develop effective infrastructure upgrading or provision, contingency plan, water pollution prevention and mitigation measures to be implemented during construction and operation stages, so as to reduce the water quality impacts to within standards. Requirements to be incorporated in the project contract document shall also be proposed;

(xiii) investigate and develop best management practices to reduce storm water and non-point source pollution as appropriate; and

(xiv) 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. If the mitigated water quality impact still exceeds the relevant criteria in Annex 6 of TM, the Applicant shall identify, predict and evaluate the residual water quality impact in accordance with Section 4.4.3 of the TM and estimate the significance of the residual impact to the water system(s) and the water sensitive receivers.

Appendix D-1

Hydrodynamic and Water Quality Modelling Requirements

Modelling Software General

1. The modelling software shall be fully 3-dimensional capable of accurately simulating the stratified condition, salinity transport, and effects of wind and tide on the water body within the model area.

2. The modelling software shall consist of hydrodynamic, water quality, sediment transport, thermal and particle dispersion modules. All modules shall have been proven with successful applications locally and overseas.

3. The hydrodynamic, water quality, sediment transport and thermal modules shall be strictly mass conserved at all levels.

4. An initial dilution model shall be used to characterise the initial mixing of the effluent discharge, and to feed the terminal level and size of the plume into the far field water quality modules where necessary. The initial dilution model shall have been proven with successful applications locally and overseas.

Model Details – Calibration and Validation

1. The models shall be properly calibrated and validated against applicable existing and/or newly collected field data before their use in this study in the Hong Kong waters, the Pearl Estuary and the Dangan (Lema) Channel. The field data set for calibration and validation shall be agreed with EPD.

2. Tidal data shall be calibrated and validated in both frequency and time domain manner.

3. For the purpose of calibration and validation, the model shall run for not less than 15 days of real sequence of tide (excluding model spin up) in both dry and wet seasons with due consideration of the time required to establish initial conditions.

4. In general the hydrodynamic models shall be calibrated to the following criteria:

Criteria	Level of fitness with field data
• tidal elevation (rms*)	< 8 %
• maximum phase error at high water and low water	< 20 minutes
• maximum current speed deviation	< 30 %
• maximum phase error at peak speed	< 20 minutes
• maximum direction error at peak speed	< 15 degrees
• maximum salinity deviation	< 2.5 ppt

* Root mean square of the error including the mean and fluctuating components shall meet the criteria at no less than 80% of the monitoring stations in the model domain

5. The *Consultant* is responsible for acquiring/developing and calibration of the models for use in this study themselves. They may make reference to the models developed under the Update on Cumulative Water Quality and Hydrological Effect of Coastal Developments and Upgrading of Assessment Tool (Agreement No. CE 42/97). They may also propose to use other models subject to agreement with EPD.

Model Details – Simulation

1. The water quality modelling results shall be qualitatively explainable, and any identifiable trend and variations in water quality shall be reproduced by the model. The water quality model shall be able to simulate and take account of the interaction of dissolved oxygen, phytoplankton, organic and inorganic nitrogen, phosphorus, silicate, BOD, temperature, suspended solids, contaminants release of dredged and disposed material, air-water exchange, *E. coli* and benthic processes. It shall also simulate salinity. Salinity results simulated by hydrodynamic models and water quality models shall be demonstrated to be consistent.

2. The sediment transport module for assessing impacts of sediment loss due to marine works shall include the processes of settling, deposition and re-erosion. The values of the modelling parameters shall be agreed with EPD. Contaminants release and DO depletion during dredging and dumping shall be simulated by the model.

3. The thermal model shall be based on the flow field produced by the hydrodynamic model. It shall incorporate the physical processes of thermal/cooled water discharge and abstraction flow, buoyancy effect of the thermal plume, and surface heat exchange. Dispersion of biocides in the discharge shall also be simulated with appropriate decay rates.

4. The models shall at least cover the Hong Kong waters, the Pearl Estuary and the Dangan Channel to incorporate all major influences on hydrodynamic and water quality. A fine grid model may be used for detailed assessment of this study. It shall either be linked to a far field model or form part of a larger model by gradual grid refinement. The coverage of the fine grid model shall be properly designed such that it is remote enough so that the boundary conditions would not be affected by the project. The model coverage area shall be agreed with EPD.

5. In general, grid size at the area affected by the project shall be less than 400 m in open waters and less than 75 m around sensitive receivers. The grid shall also be able to reasonably represent coastal features existing and proposed in the project. The grid schematization shall be agreed with EPD.

6. The Applicant shall submit a Water Quality Modelling Plan for agreement with EPD before proceeding to modelling assessment. The Plan shall demonstrate that the models meet the requirements under the sections of Modelling software general, Model details – Calibration & Validation and Model details – Simulation in this Appendix. The Plan shall also set out the methodology for the modelling assessment under the section of Modelling Assessment in this Appendix.

Modelling Assessment

1. The assessment shall include the construction and operation phases of the project. Where appropriate, the assessment shall also include maintenance dredging. Scenarios to be assessed shall cover the baseline condition and scenarios with various different options proposed by the Applicant in order to quantify the environmental impacts and improvements that will be brought about by these options. Corresponding pollution load, bathymetry and coastline shall be adopted in the model set up.

2. Hydrodynamic, sediment transport and thermal modules, where appropriate, shall be run for at least a real sequence of 15 days spring-neap tidal cycle in both the dry season and the wet season. Water quality module shall be run for at least a complete year incorporating monthly variations in Pearl River discharges, solar radiation, water temperature and wind velocity in the operational stage. If necessary, construction stage impacts may be assessed by simulating typical spring-neap cycles in the dry and wet seasons. All model simulations should be initialised with proper model spin up.

3. The results shall be assessed for compliance of Water Quality Objectives. Any changes in hydrodynamic regime shall be assessed. Daily erosion/sedimentation rate shall be computed and its ecological impact shall be assessed.

4. The impact on all sensitive receivers shall be assessed.

5. Cumulative impacts due to other projects, activities or pollution sources within a boundary to the agreement of EPD shall also be predicted and quantified.

6. All modelling input data and results shall be submitted in digital media to EPD upon request.

Appendix E

Requirements for Assessment of Waste Management Implications

The assessment of waste management implications shall cover the followings:

1. Analysis of Activities and Waste Generation

   (i) The Applicant shall identify the quantity, quality and timing of the waste arising as a result of the construction and operation activities of the Project, based on the sequence and duration of these activities, e.g. any dredged/excavated sediment/mud, construction and demolition (C&D) materials, floating refuse and other wastes which would be generated during construction and operation stages.

   (ii) The Applicant shall adopt appropriate design, general layout, construction methods and programme to minimize the generation of public fill/inert C&D materials and maximize the use of public fill/inert C&D materials for other construction works.

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 planning and design stages e.g. by modifying the design approach and in the construction stage for maximizing waste reduction shall be separately considered.

   (ii) The Applicant shall consider alternative project designs/measures to avoid/minimize floating refuse accumulation/entrapment and measures/proposals for the potential floating refuse problem, e.g. streamlining the shoreline design; measures to improve the tidal flushing capacity; alternative seawall design to facilitate floating refuse collection; and regular collection of the floating refuse along the shoreline. Regarding the potential trapping of floating refuse along the shoreline of the Project, the Applicant shall estimate as far as practicable the amount of floating refuse to be found/trapped along the shoreline of the Project in construction and operation stages of the Project. The Applicant shall develop an effective plan/design to avoid/minimize the trapping of floating refuse. If floating refuse is identified and needs to be dealt with, the Applicant shall propose appropriate measures to deal with this floating refuse in a proper and acceptable manner e.g. to collect, recycle, reuse, store, transport and dispose of.

   (iii) 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 sub-section (v) below.

   (iv) The EIA report shall also state clearly the transportation routings and the frequency of the trucks/vessels involved, any barging point or conveyor system to be used, the stockpiling areas and the disposal outlets for the waste identified.

(v) The impact caused by handling (including stockpiling, labelling, packaging and storage), collection, transportation and re-use/disposal of wastes shall be addressed in detail and appropriate mitigation measures shall be proposed. This assessment shall cover the following areas:
- potential hazard;
- air and odour emissions;
- noise;
- wastewater discharge; and
- public transport.

(vi) In addition to the above, the EIA report shall also identify practicable means of avoiding illegal dumping and landfilling, particularly on ecological sensitive areas in Lantau.

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 dredging/excavation methods to minimise dredging/excavation and dumping requirements based on the criterion that existing sediment/mud shall be left in place and not to be disturbed as far as possible

Appendix F

Requirements for Land Contamination Assessment

1. The Applicant shall identify the potential land contamination site(s) within the Study Area 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-section (i) to (iii) below and propose measure 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 Study 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.

Appendix G

Requirements for Ecological Impact Assessment

The ecological impact assessment shall cover both terrestrial and marine ecology and 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 minimise impacts on recognised sites of conservation importance (e.g. Sites of Special Scientific Interest (SSSI) and other ecologically sensitive areas (e.g. mangrove stand at Tai Ho and Yan O Wan and The Brothers Marine Park). The assessment shall identify and quantify as far as possible the potential ecological impacts associated with the Project, both directly by physical disturbance and indirectly by change of water quality to important habitats and the associated wildlife groups/species.

2. The assessment shall include the following major tasks:

   (i) review the findings of relevant studies/surveys and collate the available information regarding the ecological characters of the assessment area, in particular the terrestrial and coastal habitats at Yan O Wan, Luk Keng headland, Tai Ho Stream SSSI, corals along the coastline in the vicinity of the Project and information on Chinese White Dolphins;

   (ii) evaluate the information collected, identify any information gap relating to the assessment of potential ecological impact, 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 six months covering the wet season, and investigation to verify the information collected, fill the information gaps as identified in (ii) above, and to fulfill 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, and shall include subtidal and intertidal survey, benthic community survey, and underwater dive survey for coral communities, and Passive Acoustic Monitoring survey for marine mammals;

   (iv) establish the ecological profile of the assessment area based on information collected in the tasks mentioned in sub-section (i) to (iii) above, and describe the characteristics of each habitat found, the data set should be comprehensive and representative, and is up to date and valid for the purpose of this assessment. Major information to be provided shall include:

      (a) description of the physical environment, including all recognised sites of conservation importance and ecologically sensitive areas and assessment of whether these sites will be affected by the Project or not;

      (b) habitats maps of suitable scale (1:1000 to 1:5000) showing the types and locations of habitats and species of conservation interest 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 richness 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 interest, including but not limited to the following:

(a) Chinese White Dolphins;

(b) coral communities;

(c) pipefish, horseshoe crabs;

(d) mangrove and seagrass bed; and

(e) any other habitats/species identified as having special conservation interest by this EIA study.

(vi) describe recognized sites of conservation importance within and in the vicinity of the assessment area, including but not limited to

(a) Tai Ho Stream SSSI;

(b) The Brothers Marine Park; 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 due to various elements such as possible dredging and other associated works of the Project), indirect (e.g. changes in water qualities, 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 feeding and breeding grounds, reduction of ecological carrying capacity and habitat fragmentation, in particular the following:

(a) habitat loss and disturbance to the benthic communities, subtidal and intertidal habitats especially corals (including all hard corals, black corals, soft corals, gorgonians and sea pens), mudflats, seagrass beds and

horseshoe crab breeding and nursery grounds due to reclamation, possible dredging operation, and construction of seawall, etc., or due to potential changes in water quality;

(b) impacts to Chinese White Dolphins due to direct habitat loss or indirectly through loss of prey resources during construction and operation phases;;

(c) possible changes in marine traffic volume which may result in an increased risk of vessel collision to Chinese White Dolphins, disturbance to dolphins associated with underwater noise, including pilling, noise generated from additional work barges and vessels during the construction phase;

(d) impacts to The Brothers Marine Park, especially impacts of changes in water quality/hydrodynamics properties, changes in marine traffic volume and increase in underwater noise disturbance during construction and operation phases; and

(e) cumulative impacts due to other planned and committed concurrent developments projects.

(viii) evaluate ecological impact based on the best and latest information available during the course of the EIA study, using quantitative approach as far as practicable and covering construction and operational phases of the Project;

(ix) recommend possible and practicable mitigation measures such as alternative design and configuration of the Project, such as options involving avoid/minimise reclamation, and modification/change of construction methods to avoid, minimise and/or compensate for the adverse ecological impacts identified during construction 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 H

Requirements for Fisheries Impact Assessment

1. Existing information regarding the assessment area shall be reviewed. Based on the review results, the assessment shall identify data gap and determine if there is any need for field surveys to collect adequate baseline information. If field surveys are considered necessary, the assessment shall recommend appropriate methodology, duration and timing for such surveys.

2. The fisheries impact assessment shall cover any potential short-term and long-term impacts on capture and culture fisheries during the construction phase of the Project.

3. The fisheries impact assessment shall provide the following information:-

   (i) description of the physical environmental background;

   (ii) description and quantification of the existing fisheries activities;

   (iii) description and quantification of the existing fisheries resources;

   (iv) identification of parameters (e.g. water quality parameters) and areas of fisheries importance;

   (v) prediction and evaluation of any direct/indirect, onsite/offsite impacts on fisheries (such as potential loss or disturbance of fishing grounds, fisheries habitats, spawning or nursery grounds, aquaculture sites and artificial reefs and hydrological disruptions) caused by the project;

   (vi) evaluation of cumulative impacts on fisheries;

   (vii) proposals of mitigation measures with details on justification, description of 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 the construction phase of the Project and, if necessary, proposal for a monitoring and audit programme.

Appendix I

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 impact, 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 impact 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 impact imposed by the Project and its associated works. The scope of the AIA shall be submitted to the Antiquities and Monuments Office and 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 field investigations to assemble data. If necessary, the archaeologist shall obtain a licence from the Antiquities Authority under the Antiquities and Monuments Ordinance (Cap.53) prior to the commencement of any archaeological fieldwork. 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 impact on archaeological heritage cannot be avoided, appropriate mitigation measures should be designed and recommended in the EIA Report.

3. Marine Archaeological Investigation (MAI)

The Applicant shall conduct a marine archaeological investigation (MAI) following the Guidelines for MAI.

Guidelines for MAI

The standard practice for MAI should consist of four separate tasks, i.e. (1) Baseline Review, (2) Geophysical Survey, (3) Establishing Archaeological Potential and (4) Remote Operated Vehicle (ROV)/Visual Diver Survey/Watching Brief. Marine archaeologists should make reference to the standard and guidance of Chartered Institute for Archaeologists and Historic England to carry out MAI.

(1) Baseline Review

1.1 A baseline review should be conducted to collate the existing information in order to identify the potential for archaeological resources and, if identified, their likely character, extent, quality and value.

1.2 The baseline review will focus on known sources of archive data. It will include:

a. Geotechnical Engineering Office (GEO) - the office holds extensive seabed survey data collected from previous geological research.

b. Marine Department, Hydrographic Office - the office holds a substantial archive of hydrographic data and charts.

c. UK Hydrographic Department - the Department maintains an archive of all survey data collected by naval hydrographers.

d. Relevant government departments should be consulted in order to obtain the information of dredging history (if any) on the proposed project area. Area for sand dredging, mud disposal and allocated marine borrow area within Hong Kong should also be considered during the review.

1.3 The above data sources will provide historical records and more detailed geological analysis of submarine features which may have been subsequently masked by more recent sediment deposits and accumulated debris.

(2) Geophysical Survey

2.1 Extensive geophysical survey of the study area should deploy high resolution boomer, side scan sonar, an echo sounder and high resolution multi beam sonar. The multi beam data must be presented as processed digital terrain models to facilitate the archaeological analysis. The data received from the survey would be analysed in detail to provide:

a. Exact definition of the areas of greatest archaeological potential.

b. Assessment of the depth and nature of the seabed sediments to define which areas consist of suitable material to bury and preserve archaeological material.

c. Detailed examination of the boomer and side scan sonar records to map anomalies in and on the seabed which may be archaeological material.

d. Detailed examination of the multi beam sonar data to assess the archaeological potential of the sonar contacts.

(3) Establishing Archaeological Potential

3.1 The data examined during Task 1 and 2 will be analysed to provide an indication of the likely character and extent of archaeological resources within the study area. This would facilitate formulation of a strategy for investigation.

3.2 The results should be presented as a written report and charts. If there is no indication of archaeological material there would be no need for further work.

3.3 Charts should be presented at the most appropriate scale and show each survey contact.

Its dimensions and exact location should also be shown.

(4) Remote Operated Vehicle (ROV)/Visual Diver Survey/Watching Brief

4.1 Subject to the outcome of Task 1, 2 and 3, accepted marine archaeological practice would be to plan a field evaluation programme to acquire more detailed data on areas identified as having archaeological potential. The areas of archaeological interest can be inspected by ROV or divers. ROV or a team of divers with both still and video cameras would be used to record all seabed features of archaeological interest.

4.2 Owing to the heavy marine traffic in Hong Kong, the ROV/visual diver survey may not be feasible to achieve the target. If that is the case, an archaeological watching brief is the most appropriate way to monitor the dredging operations in areas of identified high potential to obtain physical archaeological information.

4.3 A sampling strategy for an archaeological watching brief would be prepared based on the results of Task 1, 2 and 3 to focus work on the areas of greatest archaeological potential. Careful monitoring of the dredging operations would enable immediate identification and salvage of archaeological material. If archaeological material is found, the AMO should be contacted immediately to seek guidance on its significance and appropriate mitigation measures would be prepared.

4.4 If Task 4 is undertaken, the results would be presented in a written report with charts.

Report

Five copies of the final report should be submitted to the AMO. The copyright of the report should be clearly identified. To facilitate future research, please specify that the report can be made available to the public in the Reference Library of the Heritage Discovery Centre.

Appendix J

Requirements for Hazard to Life Assessment

1. Explosives

1.1 The Applicant shall investigate alternative method to avoid the use of explosives. If there is use of explosives for the construction activities of the Project, the Applicant shall carry out hazard assessment as follows:

(i) Identify hazardous scenarios associated with the storage, transport and use of the explosives during construction of the Project with a view to determining a set of relevant scenarios to be included in a Quantitative Risk Assessment (QRA);
(ii) Execute a QRA of the set of hazardous scenarios determined in 1.1(i), expressing population risks in both individual and societal terms;
(iii) Compare individual and societal risks with the criteria for evaluating hazard to life stipulated in Annex 4 of the TM; and
(iv) Identify and assess practicable and cost-effective risk mitigation measures.

2. Siu Ho Wan Water Treatment Works (SHWWTW)

2.1 The Applicant shall investigate methods to avoid and/or minimize chlorine risk to the Project's workforce and future users of the proposed road, cycle tracks and walkways. The Applicant shall carry out hazard assessment to evaluate potential hazard to life during construction and operation stages due to SHWWTW. The hazard assessment shall include the following:

(i) Identify hazardous scenarios associated with the on-site transport, generation, storage and use of chlorine at SHWWTW with a view to determining a set of relevant scenarios to be included in a QRA;
(ii) Execute a QRA of the set of hazardous scenarios determined in 2.1(i), expressing population risks in both individual and societal terms;
(iii) Compare individual and societal risks with the criteria for evaluating hazard to life stipulated in Annex 4 of the TM; and
(iv) Identify and assess practicable and cost-effective risk mitigation measures.

3. Organic Resource Recovery Centre Phase I (ORRC1)

3.1 The Applicant shall investigate methods to avoid and/or minimize biogas risk to the Project's workforce and future users of the proposed road, cycle tracks and walkways. The Applicant shall carry out hazard assessment to evaluate potential hazard to life during construction and operation stages due to ORRC1. The hazard assessment shall include the following:

(i) Identify hazardous scenarios associated with the on-site transport, generation, storage and use of biogas at ORRC1 with a view to determining a set of relevant scenarios to be included in a QRA;
(ii) Execute a QRA of the set of hazardous scenarios determined in 3.1(i), expressing population risks in both individual and societal terms;
(iii) Compare individual and societal risks with the criteria for evaluating hazard

to life stipulated in Annex 4 of the TM; and

(iv) Identify and assess practicable and cost-effective risk mitigation measures.

4. Sham Shui Kok Transshipment Dock (SSK Dock)

4.1 The Applicant shall investigate methods to avoid and/or minimize risk from SSK Dock to the Project's workforce and future users of the proposed road, cycle tracks and walkways. The Applicant shall carry out hazard assessment to evaluate potential hazard to life during construction and operation stages due to SSK Dock. The hazard assessment shall include the following:

(i) Identify hazardous scenarios associated with the transshipment of dangerous goods at SSK Dock with a view to determining a set of relevant scenarios to be included in a QRA;

(ii) Execute a QRA of the set of hazardous scenarios determined in 4.1(i), expressing population risks in both individual and societal terms;

(iii) Compare individual and societal risks with the criteria for evaluating hazard to life stipulated in Annex 4 of the TM; and

(iv) Identify and assess practicable and cost-effective risk mitigation measures.

5. The hazard assessment shall also include a cumulative risk assessment of the Project, through interaction or in combination with other existing, committed and planned developments involving dangerous goods in the vicinity of the Project.

6. The hazard assessment shall cover both the current use by WSD as Chlorine Transshipment Dock and the potential future use by CEDD as Cat.1 dangerous goods pier.

7. The methodology to be used in the hazard assessment shall be consistent with previous studies having similar issues (e.g. Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot).

Appendix K

Requirements for Landscape and Visual Impact Assessment

1. The Applicant shall review relevant outline development plan(s), outline zoning plan(s), layout plan(s) and/or studies which may identify areas of high landscape value, open space, amenity area, conservation area and green belt designations. 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) 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 EIAO-TM and the EIAO Guidance Note No. 8/2010 "Preparation of Landscape and Visual Impact Assessment under the EIAO". 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 assess the landscape impact of the Project. The Applicant shall describe, appraise, analyse and evaluate the existing and planned landscape resources and characters of the assessment area. Annotated oblique aerial photographs and plans of suitable scale showing the baseline landscape resources and landscape character areas and mapping of impact assessment shall be extensively used to present the findings of impact assessment. Descriptive text shall provide a concise and reasoned judgment from a landscape point of view. The assessment shall be particularly focused on the sensitivity of the landscape framework and its ability to accommodate change. The Applicant shall identify the degree of compatibility of the Project with the existing and planned landscape setting and scenic spot. The landscape impact assessment shall quantify potential landscape impact as far as possible, so as to illustrate the significance of such impact arising from the Project. Clear mapping of the landscape impact is required. Where applicable, tree survey shall be carried out and the impacts on existing trees shall be addressed.

3. The Applicant shall assess the visual impact of the Project. Clear illustrations including mapping of visual impact is required. Descriptive text shall provide a concise and reasoned judgment from a visual point of view. Cumulative visual impact of the Project with other existing, committed and planned developments in the assessment area shall be assessed. The assessment shall include the following:

   (i) identification and plotting of visual envelope of the Project;

   (ii) appraisal of existing visual resources and characters as well as 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 and their views at sea level, ground 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 existing and planned setting, and its obstruction and interference with the key views within the visual envelope;

(v) description of the severity of visual impact in terms of nature, distance and number of sensitive receivers. The visual impact of the Project with and without mitigation measures shall be included and illustrated so as to demonstrate the effectiveness of the proposed mitigation measures across time; and

(vi) evaluation and explanation with supportive arguments of factors considered in arriving the significance thresholds of visual impact. The visual impacts should include presentation of an evaluation matrix derived for judging impact significance.

4. 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, site layout, development options, design and construction methods that would 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 minimise adverse effects identified above, including provision of a landscape design.

5. The mitigation measures shall include preservation of vegetation, and natural landscape resources, transplanting of mature trees, provision of screen planting, re-vegetation of disturbed land, woodland restoration, compensatory planting using native trees, provisioning/reprovisioning of amenity areas and open spaces, design of structures, provision of finishes to structures, colour scheme and texture of material used and any measures to mitigate the impact on existing and planned land uses and sensitive receivers. Parties shall be identified for the ongoing management and maintenance of the proposed mitigation works to ensure their effectiveness throughout the construction and operation phases of the Project. A practical programme for the implementation of the recommended measures shall be provided.

6. Annotated illustration such as coloured perspective drawings, plans and section/elevation diagrams, oblique aerial photographs, photographs taken at vantage points, and computer-generated photomontage shall be adopted to illustrate the landscape and visual impacts of the Project. 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.

Appendix L

Implementation Schedule of Recommended Mitigation Measures

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