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27 November 2019

Agriculture, Fisheries and Conservation Department

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

Project Title: Establishment of Fish Culture Zone at Outer Tap Mun
(Application No. ESB-325/2019)

I refer to your above application received on 15 October 2019 for an EIA Study Brief under Section 5(1)(a) of the EIA Ordinance.

In accordance with Section 5(7)(a) of the EIA Ordinance and after public inspection of the project profile, I issue the attached EIA Study Brief (No. ESB-325/2019) for your preparation of an EIA report.

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

You may submit an application for approval of the EIA report in accordance with Section 6(2) of the EIA Ordinance after its completion. Upon receipt of your application, this department will decide under Section 6(3) of the EIA Ordinance whether the EIA report meets the requirements of the EIA Study Brief and Technical Memorandum on EIA Process, and accordingly advise you under Section 6(4) of the EIA Ordinance whether a submission to the Advisory Council on the Environment (ACE) or its subcommittee is required. In this connection, you are required to provide sufficient copies of the Executive Summary of the EIA report to the Secretariat of the EIA Subcommittee of the 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. Eva Lau at 2835 1843.

Yours sincerely,

(Dr. Sunny Cheung)
Principal Environmental Protection Officer
for Director of Environmental Protection

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

ENVIRONMENTAL IMPACT ASSESSMENT STUDY BRIEF NO. ESB-325/2019

PROJECT TITLE: **Establishment of Fish Culture Zone at Outer Tap Mun**
(hereinafter known as the "Project")

NAME OF APPLICANT: **Agriculture, Fisheries and Conservation Department**
(hereinafter known as the "Applicant")

1. BACKGROUND

1.1 An application (No. ESB-325/2019) for an Environmental Impact Assessment (EIA) study brief under section 5(1)(a) of the Environmental Impact Assessment Ordinance (EIAO) was submitted by the Applicant on 15 October 2019 with a project profile (No. PP-591/2019) (the Project Profile).

1.2 The Applicant proposes to establish a new fish culture zone (FCZ) at Outer Tap Mun to facilitate the sustainable development of the local mariculture sector. The new FCZ aims to create room for the mariculture sector in Hong Kong to grow further, including allowing capture fishermen to switch to more sustainable mode of operation, making it possible for the development of newer type of deep-water mariculture in the open sea, and attracting new entrants. The location of the Project is shown in Appendix A and the scope of works is described as follows:

(i) Construction and anchorage of fish rafts within the proposed FCZ; and

(ii) Marine fish culture activities within the proposed FCZ regulated under the Marine Fish Culture Ordinance (Cap. 353).

1.3 The Project is a designated project by virtue of Item M.1(a) of Schedule 2, Part I of the EIAO, which specifies "*A fish culture zone more than 5 ha in size*".

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 proposed 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 potential affected uses;

(iv) to identify and quantify any potential losses or damage to flora, fauna and natural habitats;

(v) to identify and quantify any potential water quality, marine ecological, and fisheries impacts arising from the construction and operation of the Project and to propose measures to mitigate these impacts;

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

(vii) to identify any negative impacts on sites of cultural heritage and to propose measures to mitigate these impacts;

(viii) 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;

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

(x) to identify, predict and evaluate the residual environmental impacts (i.e. after practicable mitigation) and the cumulative effects expected to arise during the construction, and operation phases of the Project in relation to the sensitive receivers and potential affected uses;

(xi) 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;

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

(xiii) to identify any additional studies necessary to implement the mitigation measures of 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 study brief is to set out the purposes and objectives of the EIA study, the scope of environmental issues which shall be addressed, the requirements that the EIA study shall need to fulfil, and the necessary procedural and reporting requirements. The Applicant shall demonstrate in the EIA report whether the criteria in the relevant sections of the Technical Memorandum on the Environmental Impact Assessment Process of the Environmental Impact Assessment Ordinance (hereinafter referred to as "the TM"), are fully complied with.

3.2 The Scope

3.2.1 The scope of this EIA study shall cover the Project and associated works mentioned in 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, design and construction methods of the Project with a view to deriving the preferred development option(s) that will avoid or minimise adverse environmental impact;

(ii) potential water quality impacts caused by the Project and associated works on water systems including the Mirs Bay Water Control Zone and the Tolo Harbour and Channel Water Control Zone and relevant water sensitive receivers (such as secondary contact recreation areas, Hoi Ha Wan Marine Park, existing and planned FCZs, etc.), during the construction and operation of the Project;

(iii) potential marine ecological impacts, in particular impacts on ecological sensitive receivers in the vicinity of the Project, including coral and benthic

communities and Finless Porpoise, arising from the construction and operation of the Project;

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

(v) potential waste management implications arising from the construction and operation of the Project, including handling and disposal of general refuse, domestic and any other waste generated during the operation of the Project;

(vi) potential landscape impacts arising from the Project if any land-based structures and activities, and potential visual impacts arising from the above-water structures of the Project on sensitive receivers within the visual envelope, including hikers and tourists visiting Sai Kung West Country Park, Sai Kung East Country Park, Tap Mun, and Ko Lau Wan;

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

(viii) potential cultural heritage impacts, including marine archaeological impacts due to the Project; and

(ix) potential cumulative impacts of the Project, through interaction or in combination with other existing, committed and planned projects in the vicinity of the Project, including the proposed FCZs at Wong Chuk Kok Hoi and Mirs Bay.

3.3 Description of the Project

3.3.1 Purpose(s) and Objectives of the Project

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

3.3.2 Details of the Project

3.3.2.1 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, 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 and operational phase of the Project together with the programme within these phases, where appropriate, shall be given. The waters and any land taken by the Project site(s),

construction sites, operation sites and any associated access arrangements, auxiliary facilities (including any additional structures to fish rafts (e.g. storage and shelters for fish farmers) and activities (e.g. cooking), and any associated land-based structures and activities), landscape areas (if any) shall be shown on a scaled map. The uses of the Project shall be described and the different sea and land use areas shall be demarcated as appropriate.

3.3.3 Background and History of the Project

3.3.3.1 The Applicant shall provide information on the site location and site history of the Project, interactions with other projects, and the consideration of the different development options, taking into account the principles of avoidance, minimising and control of adverse environmental impacts. The options might include siting, size, design, methods and sequence of construction works, and access arrangements for the Project. The key reasons for selecting the proposed development options and siting 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.

3.3.4 Need for Sediment Removal

3.3.4.1 The Applicant shall provide information on the need for sediment removal for maintaining normal operation of the Project. If such a need is identified, the Applicant shall assess and quantify the frequency as well as the likely extent of sediment removal required, the associated potential environmental impacts, and mitigation measures required.

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

3.4.3 Water Quality Impact

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

3.4.3.2 The assessment area for the water quality impact assessment shall cover the Mirs Bay Water Control Zone and the Tolo Harbour and Channel Water Control Zone as designated under the Water Pollution Control Ordinance (Cap. 358), and the water

sensitive receivers in the vicinity of the Project, including the following sensitive receivers:

(i) Hoi Ha Wan Site of Special Scientific Interest (SSSI);
(ii) Hoi Ha Wan Marine Park;
(iii) Recreation areas (such as secondary contact recreation subzones of Water Control Zones);
(iv) Existing FCZs at Tap Mun, Kau Lau Wan, Sham Wan and other nearby areas;
(v) Proposed FCZs at Wong Chuk Kok Hoi and Mirs Bay;
(vi) Ecological habitats for marine organism including coral and amphioxus habitat (if any) and benthic communities at/near the proposed FCZ (such as those coral communities at the coastal areas of Nam She Wan, Chek Chau, west of Tap Mun, and those amphioxus habitat to the east of Ko Lau Wan);
(vii) Spawning ground (if any) and nursery area of fisheries resources and other fisheries sensitive receivers (including artificial reefs such as those in Long Harbour and Hoi Ha Wan Marine Park);
(viii) Sai Kung West Country Park and Sai Kung East Country Park;
(ix) Beaches (both gazetted beaches and non-gazetted beaches); and
(x) Seawater intakes (if any).

3.4.3.3 The water quality impact assessment for the construction phase (including construction and anchorage of fish rafts and the use of tug boats to tow the fish rafts) and operation phase (including maintenance dredging or removal of sediments, subject to confirmation under section 3.3.4) of the Project shall follow the detailed technical requirements given in Appendix B.

3.4.4 Marine Ecological Impact

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

3.4.4.2 The assessment area for the purpose of the marine ecological impact assessment shall be the same as the assessment area for Water Quality Impact Assessment described in section 3.4.3.2. The assessment shall include potential impacts on ecological sensitive receivers in the vicinity of the Project, including existing, planned/potential Marine Parks and Sites of Special Scientific Interest, coral and benthic communities, Amphioxus, and Finless Porpoise.

3.4.4.3 The marine ecological impact assessment for the construction and operation of the Project shall follow the detailed technical requirements given in Appendix C.

3.4.5 Fisheries Impact

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

3.4.5.2 The assessment area shall be the same as the assessment area for Water Quality Impact Assessment described in section 3.4.3.2. 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 the existing FCZs at Kau Lau Wan and other nearby areas (e.g. Tap Mun, Sham Wan), spawning and nursery area of commercial fisheries resources, artificial reefs in Long Harbour and Hoi Ha Wan Marine Park, etc.

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

3.4.6 Waste Management Implication

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

3.4.6.2 The assessment of the waste management implications arising from the construction and operation of the Project shall follow the detailed technical requirements given in Appendix E of this EIA study brief.

3.4.7 Landscape and Visual Impact

3.4.7.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing visual impacts, including glare impact, as stated in Annexes 10 and 18 of the TM respectively, and the EIAO Guidance Note No. 8/2010 “Preparation of Landscape and Visual Impact Assessment under the EIAO”. The assessment area for the visual impact assessment shall be defined by the visual envelope of the Project. The extent of the defined visual envelope shall be shown on a plan and documented in the EIA report.

3.4.7.2 If any associated land-based structures and activities are identified, a landscape impact assessment shall be carried out in accordance with the Annexes 10 and 18 of the TM respectively, the EIAO Guidance Note No. 8/2010 “Preparation of Landscape and Visual Impact Assessment under the EIAO”, and the report of “Landscape Value Mapping in HK”. The assessment area for the landscape impact assessment shall include landscape character areas and landscape resources within 500 metres from the boundary of the Project and the works of the Project as identified in the EIA.

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

3.4.8 Air Quality Impact

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

3.4.8.2 The assessment area for air quality impact assessment shall be defined by a distance of 500 meters from the boundary of the Project site or other project locations as identified in the EIA, which shall be extended to include major existing, planned and committed air pollutant emission sources that may have a bearing on the environmental acceptability of the Project. The assessment shall include the existing, planned and committed sensitive receivers within the study area as well as areas where air quality may be potentially affected by the Project. The assessment shall be based on the best available information at the time of the assessment. The assessment shall also take into account the impacts of emission sources from nearby concurrent projects, if any.

3.4.8.3 The assessment of air quality impact arising from the construction and operation of the Project shall follow the detailed technical requirements given in Appendix G.

3.4.9 Impact on Cultural Heritage

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

3.4.9.2 A marine archaeological investigation (MAI) shall be conducted. It shall include area to be affected by the marine works associated with the anchoring system of fish rafts. The MAI shall follow the detailed technical requirements in Appendix H.

3.4.9.3 The MAI shall be carried out by a qualified marine archaeologist and if field investigation is required, he/she shall obtain a licence in accordance with the Antiquities and Monuments Ordinance (Cap.53).

3.5 Environmental Monitoring and Audit (EM&A) Requirements

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

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

3.5.3 The Applicant shall prepare a Project Implementation Schedule (in the form of a checklist as shown in Appendix I) 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 effective retrieval of pertinent key information, the EIA report shall contain a summary table of environmental impacts showing the assessment points, results of impact predictions, relevant standards or criteria, extents of exceedances predicted, impact avoidance measures considered, mitigation measures proposed and residual impacts (after mitigation). This summary shall cover each individual impact and shall also form an essential part of the executive summary of the EIA report.

3.6.3 Documentation of Key Assessment Assumptions, 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 mitigation measures considered during the course of EIA study, including siting, size/scale, design, construction methods and sequence of works for the Project, with a view to avoiding or minimising and mitigating adverse environmental impacts. A comparison of the environmental benefits and dis-benefits of applying different mitigation measures shall be made. This summary shall cover the key impacts and shall also form an essential part of the executive summary of the EIA report.

3.6.5 Documentation of Public Concerns

The EIA report shall contain a summary of the main concerns of the general public, special interest groups and the relevant statutory or advisory bodies received 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 J. The Applicant shall, upon request, make additional copies the above documents available to the public, subject to payment by the interested parties of full costs of printing.

6. OTHER PROCEDURAL REQUIREMENTS

6.1 If there is any change in the name of Applicant for this EIA study brief during the course of the EIA study, the Applicant must notify the Director immediately.

6.2 If there is any key change in the scope of the Project mentioned in section 1.2 of this EIA study brief and in the Project Profile (No. PP-591/2019), the Applicant must seek confirmation from the Director in writing on whether or not the scope of issues covered by this EIA study brief can still cover the key changes, and the additional issues, if any, that the EIA study must also address. If the changes to the Project fundamentally alter the key scope of the EIA study brief, the Applicant shall apply to the Director for a fresh EIA study brief.

7. LIST OF APPENDICES

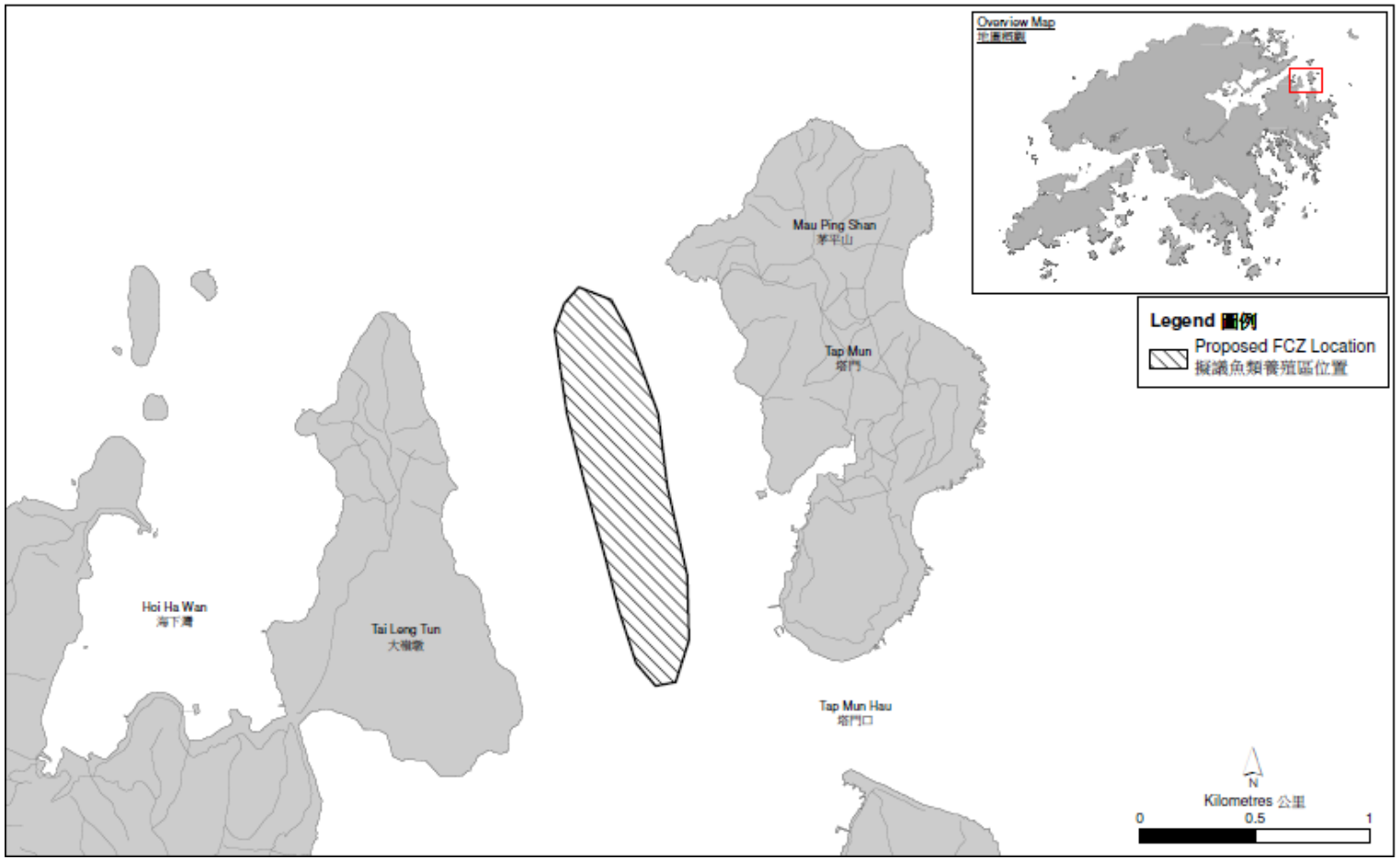
7.1 This EIA study brief includes the following appendices:

Appendix A – Project Location Plan
Appendix B – Requirements for Water Quality Impact Assessment
Appendix C – Requirements for Marine Ecological Impact Assessment
Appendix D – Requirements for Fisheries Impact Assessment
Appendix E – Requirements for Assessment of Waste Management Implications
Appendix F – Requirements for Landscape and Visual Impact Assessment
Appendix G – Requirements for Air Quality Impact Assessment
Appendix H – Requirements for Marine Archaeological Investigation
Appendix I – Implementation Schedule of Recommended Mitigation Measures
Appendix J – Requirements for EIA Report Documents

--- END OF EIA STUDY BRIEF ---

November 2019
Environmental Assessment Division
Environmental Protection Department

Appendix A



Project Title: Establishment of Fish Culture Zone (FCZ) at Outer Tap Mun
工程項目名稱:在外塔門設立魚類養殖區

(This figure is prepared based on Figure 2.1 of Project Profile No.: PP-591/2019)
(本圖是根據工程項目簡介 PP-591/2019 圖 2.1 編製)

EIA Study Brief No.: 環評研究概要編號:	**ESB-325/2019**
Appendix A: Project Location Plan 附錄 A: 工程項目位置圖	

Appendix B

Requirements for Water Quality Impact Assessment

1. The Applicant shall identify and analyse physical, chemical and biological disruptions of the water systems arising from the construction and operation of the Project.

2. The Applicant shall predict, quantify and assess any water quality impacts arising from the 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 B-1. Possible impacts due to, including floating of permeable cages, pollution loadings from fish feed, feed wastage, fish excretion, dead fish, waste from human activities and faecal pollution from dogs and cats living on fish rafts, fish drugs or other pharmaceutical chemicals, feed additives, disinfection of culture gears, and maintenance dredging or removal of sediments shall include changes in hydrology, flow regime, sediment erosion and deposition patterns, morphological change of seabed profile, water quality and sediment quality. Affected sensitive receivers including the proposed FCZ itself shall be identified by the assessment tool with indications of degree of severity.

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

   (i) The water quality impacts due to routine operation of the proposed FCZ in regard to the pollution loadings from fish feed, feed wastage, fish excretion, dead fish, faecal pollution from dogs and cats living on fish rafts, fish drugs or other pharmaceutical chemicals, feed additives, disinfection of culture gears, and human activities on fish rafts and associated land-based structures; and

   (ii) Other possible water quality impacts during the operation phase including the frequency, duration and rate of maintenance dredging or removal of sediments, temporary relocation of fish rafts, and accidental spillage associated with transfer and storage of fish feed, fish drugs and other pharmaceutical chemicals.

4. The Applicant shall address water quality impacts due to the construction phase and operation phase of the Project. Essentially, the assessment shall address the following:

   (i) Collect and review background information on the existing and planned water systems 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 and through appropriate site survey and tests when existing data are

insufficient;

(iii) Identify and analyse relevant existing and planned future activities, beneficial uses and water sensitive receivers related to the affected water systems. 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 other relevant published land use plans;

(iv) Identify pertinent water quality objectives and establish other appropriate water quality criteria or standards, including the requirements corresponding to total inorganic nitrogen loading, dissolved oxygen, likelihood of toxic algae blooms and introduction of pharmaceutical chemicals, for the water systems and the sensitive receivers identified in (i), (ii) & (iii) above;

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

(vi) Identify any alternation of any flow regimes of water bodies, erosion or sedimentation due to the Project and any other hydrological changes in the assessment area;

(vii) Identify and quantify existing and likely future water pollution sources, including pollution generated from the Project, sewage from workforce, contaminants 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 assessment 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 systems and water sensitive receivers due to those alternations and changes identified in (vi) above. Possible impacts include changes in hydrology, flow regime, water quality and release of sediments and other contaminants in the construction phase; as well as changes in water quality, marine traffic, boating and visitor activities and release of sediments in the operation phase of the Project, etc. The prediction shall take into account and include possible different construction and operation phases of the Project. The use of disinfection shall be carefully evaluated;

(x) Assess the cumulative impacts due to other related concurrent and planned projects, activities or pollution sources within the assessment area and upon the operation of the existing FCZs that may have a bearing on the environmental acceptability of the Project;

(xi) Analyse the provision and adequacy of existing and planned future facilities to reduce pollution 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 phases so as to reduce the water quality impacts to within standards. Effluent generated from the Project shall require appropriate collection, treatment and disposal;

(xiii) Investigate and develop best management practices to reduce pollution as appropriate; and

(xiv) Evaluate and quantify residual impacts on the water systems and the sensitive receivers with regard to the appropriate water quality objectives, criteria, standards or guidelines.

Appendix B-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. A carrying capacity model shall be used to determine the maximum fish stock level without causing unacceptable water quality deterioration in the FCZ. The carrying capacity model shall take into account factors of background water quality, pollution loading from mariculture, flushing rate, algal dynamics and sediment-water interactions. The carrying capacity model shall have been proven with successful applications locally or overseas.

Model details – Calibration & 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, including the Victoria Harbour, Western Buffer, Eastern Buffer, Southern, and Tolo Harbour and Channel Water Control Zones, defined under the Water Pollution Control Ordinance. The field data set for calibration and validation shall be agreed with Environmental Protection Department (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 (@)	< 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 Applicant shall be responsible for acquiring/developing and calibration of the models for use in this study themselves. They may make reference to the models developed under the Update on Cumulative Water Quality and Hydrological Effect of Coastal Developments and Upgrading of Assessment Tool (Agreement No. CE 42/97). They may also propose to use other models subject to agreement with EPD.

Model details – Simulation

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

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

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

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

5. The Applicant shall submit a Water Quality Modelling Plan for agreement with EPD before proceeding to modelling assessment. The Plan shall at least demonstrate that

the models meet the requirements as set out under the sections of Modelling software general, Model details – Calibration & Validation and Model details – Simulation 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 a complete year incorporating monthly variations in Pearl River discharges, solar radiation, water temperature and wind velocity in the operational phase. If necessary, construction phase 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. For assessing the carrying capacity of the FCZ, the Applicant shall carry out a sensitive analysis on the change in water quality against different fish stock levels. The Applicant shall also provide uncertainty estimates for the 90th percentile and 95th percentile safety margins. Detailed methodology shall be agreed with EPD.

4. The results shall be assessed for compliance of Water Quality Objectives.

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

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

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

Appendix C

Requirements for Marine Ecological Impact Assessment

1. In the marine ecological impact assessment, 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 and other ecologically sensitive areas. The assessment shall identify and quantify as far as possible the potential marine ecological impacts to the natural environment and the associated wildlife groups and habitats/species arising from the Project including its construction and operation phases as well as the subsequent management and maintenance of the proposals.

2. The assessment shall include the followings:

   (i) Review of the findings of relevant studies/surveys and collection of the available information regarding the ecological characters of the assessment area;

   (ii) Evaluation of information collected and identification of any information gap relating to the assessment of potential marine ecological impact, and determine the ecological field surveys and investigations that are needed for an impact assessment as required in the following sections;

   (iii) Carrying out necessary field surveys of at least 6 months covering both the wet and dry seasons, and investigations to verify the information collected in (ii) above, to fill the information gaps identified and to fulfil the objectives of the EIA study. The field surveys shall cover flora, fauna and any other habitats/ species of conservation importance (e.g. Amphioxus), and shall include surveys for coral and benthic communities;

   (iv) Establishment of the general ecological profile of the assessment area based on data of relevant previous studies/surveys and results of the ecological field surveys, if any, and description of the characteristics of each habitat found. Major information to be provided shall include:

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

      (b) habitat maps of suitable scale (1:1000 to 1:5000) showing the types and locations of habitats/species in the assessment area;

      (c) ecological characteristics of each habitat type such as size, type, species

present, dominant species found, species diversity and abundance, community structure, seasonal pattern, ecological value and inter-dependence of the habitats and species, and presence of any features of ecological importance;

(d) representative colour photos of each habitat type and any important ecological features identified; and

(e) species found that are rare, endangered and/or listed under local legislation, international conventions for conservation of wildlife/ habitats or Red Data Books.

(v) Investigation and description of the existing wildlife uses of the various habitats with special attention to those wildlife groups and habitats with conservation interests, including:

(a) ecological habitats for marine organism including Amphioxus, Finless Porpoise (*Neophocaena phocaenoides*), and coral and benthic communities; and

(b) any other habitats or species identified as having special conservation interests by this EIA study.

(vi) Using suitable methodology and considering also other projects in the vicinity of the Project area reasonably likely to occur at the same time, identification and quantification as far as possible of any direct, indirect, on-site, off-site, primary, secondary and cumulative marine ecological impacts, such as destruction of habitats, reduction of species abundance/diversity, loss of breeding and feeding grounds, reduction of ecological carrying capacity, loss in ecological linkage and function, habitat fragmentation and any other possible disturbance caused by the Project, and in particular the followings:

(a) noise, glare, dust and other human disturbance to wildlife during construction and operation phases of the Project;

(b) indirect marine ecological impacts due to changes in the water quality and hydrology in the assessment area including the Hoi Ha Wan Marine Park and SSSI, and increase of marine traffic or changes in its pattern potentially affecting the Finless Porpoise during construction and operation phases;

(c) impacts to local ecosystems, habitats and native species due to the possible introduction of non-native/invasive alien species during operation of the new FCZ; and

(d) cumulative impacts due to operation of the existing Kau Lau Wan, Tap Mun, and Sham Wan FCZs.

(vii) Evaluation of marine 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 operation phases of the Project as well as the subsequent management and maintenance requirement of the Project;

(viii) Recommendations for possible alternatives and practicable mitigation measures, such as restriction of works at specified season or time, adoption of appropriate construction methods and/or programme, to avoid, minimise and/or compensate for the adverse marine ecological impacts identified during construction and operation of the Project;

(ix) Evaluation of the feasibility and effectiveness of the recommended mitigation measures and definition of the scope, type, location, implementation arrangement, resources requirement, subsequent management and maintenance of such measures;

(x) Determination and quantification as far as possible of the residual marine ecological impacts after implementation of the proposed mitigation measures;

(xi) Evaluation of the significance and acceptability of the residual marine ecological impacts by making reference to the criteria in Annex 8 of the TM; and

(xii) Review of the need for and recommendation on any ecological monitoring programme required.

Appendix D

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 and updated 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 direct, indirect, short-term and long-term impacts on capture and culture fisheries during the construction and operation phases of the Project.

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

   (i) description of the physical environmental background;

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

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

   (iv) identification of parameters (e.g. water quality parameters) and areas that are important to fisheries and will be affected;

   (v) prediction and evaluation of any direct/indirect, on-site/off-site impacts on fisheries caused by the Project, including temporary relocation of rafts under unforeseeable circumstances, feed wastage, excretion from culture species, medication of drugs, other human activities on rafts, loss and disturbance of fishing ground, fisheries habitat, spawning and nursery area, aquaculture sites and artificial reefs;

   (vi) evaluation of cumulative impacts on fisheries due to other planned and committed concurrent development projects at or near the assessment area;

   (vii) proposals of practicable 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 and operation phases of the Project and, if necessary, proposal for a monitoring and audit programme.

Appendix E

Requirements for Assessment of Waste Management Implications

The assessment of waste management implications shall cover the following:

1. Analysis of Activities and Waste Generation

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

   (ii) The Applicant shall adopt appropriate design, general layout, construction methods and programme to minimise the generation of public fill/inert C&D materials and maximise 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 evaluated. Measures that can be taken in the planning and design phases e.g. by modifying the design approach and in the construction phase for maximising waste reduction shall be separately considered;

   (ii) The Applicant shall consider alternative project designs/measures to avoid/minimise floating refuse accumulation/entrapment and measures/proposals for the potential floating refuse problem. The Applicant shall develop an effective plan/design to avoid/minimise 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 maximising re-use, the types and quantities of the wastes required to be disposed of as a consequence shall be estimated and the disposal methods/options for each type of wastes shall be described in detail. The disposal methods/options recommended for each type of wastes shall take into account the result of the assessment in section (iv) below;

   (iv) The EIA report shall state the transportation routings and the frequency of the trucks/vessels involved, any barging point or conveyor system to be used, the

stockpiling areas and the disposal outlets for the wastes identified; and

(v) The impact caused by handling (including stockpiling, labelling, packaging & 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.

3. Dredging/Excavation and Dumping

(i) Subject to the confirmation on the need for sediment removal under section 3.3.4 of this EIA study brief, 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 practical 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 Landscape and Visual Impact Assessment

1. The Applicant shall review relevant plan(s) and/or studies which may identify areas of high landscape value and recommend country park, coastal protection area, green belt and conservation area 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) and any published land use plans shall be highlighted and appropriate follow-up action shall be recommended. A system shall be derived for judging the landscape and visual impact significance as required under the Annexes 10 and 18 of the TM. Cumulative landscape and visual impacts of the Project with other existing, committed and planned developments in the assessment area shall be assessed.

2. The Applicant shall describe, appraise, analyse and evaluate the existing and planned landscape resources and character of the assessment area. A system shall be derived for judging landscape and visual impact significance. Annotated oblique aerial photographs and plans of suitable scale showing the baseline landscape character areas and landscape resources and mapping of impact assessment shall be extensively used to present the findings of impact assessment. Descriptive text shall provide a concise and reasoned judgment from a landscape and visual point of view. The sensitivity of the landscape framework and its ability to accommodate change shall be particularly focused on. The Applicant shall identify the degree of compatibility of the Project with the existing and planned landscape setting, recreation and tourism related uses, and scenic spot. The landscape impact assessment shall quantify the potential landscape impact as far as possible so as to illustrate the significance of such impacts arising from the proposed development. Clear mapping of the landscape impact is required. Tree survey shall be carried out and the impacts on existing trees shall be addressed. Cumulative landscape and visual impacts of the Project with other committed and planned developments shall be assessed.

3. The Applicant shall assess the visual impacts of the Project. Clear illustration including mapping of visual impact is required. The assessment shall include the following:

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

   (ii) appraisal of existing visual resources and character as well as the future outlook of the visual system of the assessment area;

   (iii) identification of the key groups of existing and planned sensitive receivers within the visual envelope with regard to views from ground level, sea level and elevated vantage points;

(iv) description of the visual compatibility of the Project with the surrounding and the planned setting, and its obstruction and interference with the key views of the study areas;

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

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

4. The Applicant shall evaluate the merits of preservation in totality, in parts or total destruction of existing landscape and the establishment of a new landscape character area. In addition, alternative location, layout, design, built-form and construction method that will avoid or reduce the identified landscape and visual impacts shall be evaluated for comparison before adopting other mitigation or compensatory measures to alleviate the impacts. The mitigation measures proposed shall not only be concerned with damage reduction but shall also include consideration of potential enhancement of existing landscape and visual quality. The Applicant shall recommend mitigation measures to minimise adverse effects identified above, including provision of a master landscape plan.

5. The mitigation measures shall also include design of structure, provision of finishes to structure, colour scheme and texture of material used and any measures to mitigate the impact on the existing and planned land use and visually sensitive receivers. Parties shall be identified for the on-going management and maintenance of the proposed mitigation works to ensure their effectiveness throughout the construction phase and operation phase of the Project, associated works, supporting facilities and essential infrastructures. A practical programme and funding proposal for the implementation of the recommendation measures shall be provided.

6. Annotated illustration materials such as colour perspective drawings, plans and section/elevation diagrams, annotated oblique aerial photographs, photographs taken at vantage points, and computer-generated photomontage shall be adopted to fully illustrate the landscape and visual impacts of the Project. In particular, the landscape and visual impacts of the Project with and without mitigation measures from representative viewpoints, particularly from views of the most severely affected visually sensitive receivers (i.e. worst case scenario), shall be properly illustrated in existing and planned setting at four stages (existing condition, Day 1 with no mitigation measures, Day 1 with mitigation measures and Year 10 with mitigation measures) by computer-generated photomontage so as to demonstrate the effectiveness of the proposed mitigation measures. Computer graphics shall be

compatible with Microstation DGN file format. The Applicant shall record the technical details in preparing the illustration, which may need to be submitted for verification of the accuracy of the illustration.

Appendix G

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 construction and operation phases of the Project.

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

   (iii) Presentation of background air quality levels in the study area for the purpose of evaluating cumulative air quality impacts during construction and operation phases of the Project. If the PATH (Pollutants in the Atmosphere and their Transport over Hong Kong) model is used to estimate the future background air quality, details for the estimation of all emission sources to be adopted in the model runs should be clearly presented.

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

   (i) Identification and description of existing, committed and planned ASRs that would likely be affected by the Project, including those earmarked on the relevant Outline Zoning Plans, Development Permission Area Plans, Outline Development Plans and Layout Plans and other relevant published land use plans, including plans and drawings published by Lands Department and any land use and development applications approved by the Town Planning Board. The Applicant shall select the assessment points of the identified ASRs that represent the worst impact point of these ASRs. A map clearly showing the location and description such as name of buildings, their uses and height of the selected assessment points shall be given. The separation distances of these ASRs from the nearest emission sources shall also be given.

   (ii) Provision of a list of air pollution emission sources, including any nearby emission sources which are likely to have impact related to the Project based on the analysis of the construction and operation activities in section 1 above. Confirmation regarding the validity of the assumptions adopted and the magnitude of the 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 impact as affecting the existing, committed and planned ASRs within the study area shall be assessed, based on the best information available at the time of assessment.

3. Construction Phase Air Quality Impact

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

(ii) If the Applicant anticipates that the Project will give rise to significant construction dust impacts likely to exceed recommended limits in the TM at the ASRs despite the incorporation of the dust control measures proposed, a quantitative assessment 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 water-spraying, re-scheduling construction programme to minimise concurrent dust impact arising from different construction sites, for fugitive dust control. The Applicant shall describe the means of transportation and their routings involved, with a view to addressing potential dust nuisance caused by transportation activities. Any mitigation measures recommended for fugitive dust control should be well documented in the EIA report.

(iv) A monitoring and audit programme for the construction phase of the Project shall be devised to verify the effectiveness of the proposed control measures so as to ensure proper control of fugitive dust emission.

4. Operational Phase Air Quality Impact

(i) The Applicant shall assess the expected air quality impact arising from the activities in the proposed Project site, including odour and gaseous emissions during the operational phase based on assumed reasonably worst case scenario

under normal operating condition.

(ii) If the Applicant anticipates that the Project will give rise to significant operational phase air quality impacts likely to exceed the recommended limits in the TM at the 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.

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

5. Quantitative Assessment Methodology

(i) The Applicant shall conduct the quantitative assessment by applying the general principles enunciated in the modelling guidelines in Appendix G-1 while making allowance for the specific characteristic of the Project. This specific methodology must be documented in such level of details, preferably assisted with tables and diagrams, to allow the readers of the EIA report to grasp how the model has been set up to simulate the situation under study without referring to the model input files. In case of doubt, prior agreement between the Applicant and the Director on specific modelling details should be sought.

(ii) For the purpose of assessing the compliance with the criteria as stated in section 1 of 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) Detailed calculations of air pollutants emission rates for input to the model shall be presented in the EIA report. A summary table of the emission rates shall be presented in the EIA report. The Applicant must ensure consistency between the text description and the model files at every stage of submissions for review.

(iv) For estimating the 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. Use of any alternatives to the PATH model shall be agreed with the Director. Details of the adopted emission sources should be presented.

(v) Ozone Limiting Method (OLM) or Discrete Parcel Method (DPM) or other appropriate method shall be used to estimate the conversion ratio of NOx to

NO2 if NO2 has been identified as a key/representative air pollutant.

(vi) The Applicant shall calculate the overall cumulative air quality impact at the ASRs identified under section 2 above and compare these results against the criteria set out in section 1 of Annex 4 in the TM. The predicted air quality impacts (both unmitigated and mitigated) shall be presented in the form of summary table(s) and pollution contours, to be evaluated against the relevant air quality standards and on any effect they may have on the land use implications. Plans of a suitable scale should be used to present pollution contours to allow buffer distance requirements to be determined properly.

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

(ii) Upon consideration of mitigation measures, if the mitigated air quality impact still exceeds the relevant criteria in Annex 4 of the TM, the Applicant shall identify, predict, and evaluate the residual air quality 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

All input and output file(s) of the model run(s), including those files for the generation of pollution contours as well as the emissions calculation worksheets, shall be submitted to the Director in electronic format together with the submission of the EIA report.

Appendix G-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.]

The air quality modelling guidelines shall include the following guidelines as published on the website of the Environmental Protection Department

(https://www.epd.gov.hk/epd/english/environmentinhk/air/guide_ref/guide_aqa_model.html):

i) Guidelines on Choice of Models and Model Parameters (Revised);

ii) Guidelines on Assessing the 'Total' Air Quality Impacts (Revised);

iii) Guidelines on the Use of Alternative Computer Models in Air Quality Assessment;

iv) Guidelines on the Estimation of PM2.5 for Air Quality Assessment in Hong Kong; and

v) Guidelines on the Estimation of 10-minute Average SO2 Concentration for Air Quality Assessment in Hong Kong.

Appendix H

Requirements for Marine Archaeological Investigation (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 the Institute for Archaeologists and English Heritage 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) Civil Engineering and Development Department, Geotechnical Engineering Office – the Department holds extensive seabed survey data collected from previous geological research.

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

(c) The Royal Naval Hydrographic Department in the UK - 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 would 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 Antiquities and Monuments Office (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.

5. Report

5.1 Five copies of the final report should be submitted to the AMO for record.

Appendix I

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 J

Requirements for EIA Report Documents

1. The Applicant shall supply the Director with the following number of copies of the EIA report and the executive summary:

   (i) 30 copies of the EIA report and 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) 30 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.