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21 June 2023

By Registered Post & Fax

Highways Department

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

Project Title: Tsing Yi – Lantau Link
(Application No. ESB-359/2023)

I refer to your above application received on 10 May 2023 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-359/2023) 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. Sally SHEK (Tel: 2594 6324) regarding the details in due course.

If the EIA report is selected by ACE for submission and presentation, you are expected

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

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

Should you have any queries on the above application, please contact my colleague Mr. Simon HO at 2835 1153.

Yours sincerely,

(Miss Queenie Y.C. NG)
Acting Principal Environmental Protection Officer
for Director of Environmental Protection

Encl.

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

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

Environmental Impact Assessment Study Brief No. ESB-359/2023

Project Title: Tsing Yi – Lantau Link
(hereinafter known as the "Project")

Name of Applicant: Highways Department
(hereinafter known as the "Applicant")

1. BACKGROUND

1.1 An application (No. ESB-359/2023) 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 10 May 2023 with a project profile (No. PP-653/ 2023) (the Project Profile).

1.2 The Project is to enhance the connectivity between Tsing Yi and North Lantau to meet the future traffic demands generated by the future developments in North Lantau and the Northwest New Territories. The Project will provide additional traffic capacity between Lantau and urban for the long-term planning horizon. The location of the Project is shown in Appendix A and the scope of works is described as follows:

(i) a dual three-lane long-span suspension bridge with a main span of about 1 400 m long crossing the Ma Wan Fairway between Ma Wan and Tsing Yi;

(ii) a dual three-lane long-span cable-supported bridge with a main span of about 500 m long crossing the Kap Shui Mun Fairway between North Lantau and Ma Wan;

(iii) Tsing Yi Connection, consisting of extension of the Tsing Yi – Lantau Link mainline from the proposed suspension bridge crossing the Ma Wan Fairway to the Tsing Sha Highway at the west of Nam Wan Tunnel, and provision of slip roads and viaducts connecting with local roads at Tsing Yi including Tsing Yi North Coastal Road and Tsing Yi Road West, together with realignment of Tsing Sha Highway and Cheung Tsing Highway northbound and modification of Tsing Sha Highway and Cheung Tsing Highway southbound;

(iv) North Lantau Interchange, consisting of slip roads, viaducts and a tunnel at North Lantau connecting the proposed long-span bridge crossing the Kap Shui Mun Fairway to North Lantau Highway, the proposed Tsing Lung Bridge under Route 11, and the proposed Hong Kong Island West-Northeast Lantau Link; and

(v) associated administration and ancillary buildings, as well as associated civil, marine, geotechnical, landscape, road and drainage works, toll collection facilities, bridge facilities, traffic control and surveillance system, electrical and mechanical installations, ventilation facilities, reprovisioning of facilities affected by the proposed road works and environmental mitigation measures.

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

(vi) Item A.1 – 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 roads;

(vii) Item A.8 – A road or railway bridge more than 100 m in length between abutments;

(viii) Item C.1 – Reclamation works (including associated dredging works) more than 5 ha in size;

(ix) Item C.2 –Reclamation works (including associated dredging works) more than 1 ha in size and a boundary of which (a) is less than 500 m from the nearest boundary of an existing or planned (ii) site of cultural heritage, (iii) bathing beach; or (v) fish cultural zone.

(x) Item C.12 – A dredging operation which (a) is less than 500 m from the nearest boundary of an existing or planned (ii) site of cultural heritage, (iii) bathing beach; or (v) fish culture zone.

1.4 Pursuant to Section 5(7)(a) of the EIAO, the Director of Environmental Protection (the Director) issues this Environmental Impact Assessment (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 stages of the Project and associated activities that will take place concurrently. This information will contribute to decisions by the Director on:

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

(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 potential affected uses, and to propose measures to mitigate these impacts;

(iv) to identify and quantify any potential impacts from point and non-point pollution sources on the identified water systems and sensitive receivers and to propose measures to mitigate these impacts;

(v) to identify and quantify potential waste management requirements and to propose measures to mitigate these impacts;

(vi) to identify and quantify contaminated land within the Project area, and to propose measures to avoid disposal in the first instance;

(vii) to identify, evaluate and address any potential ecological impacts arising from the Project and to propose measures to mitigate these impacts;

(viii) to identify and quantify the fisheries impacts and to propose measures to mitigate these impacts;

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

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

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

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

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

(xiv) 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;

(xv) 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;

(xvi) to investigate the extent of the secondary environmental impacts that may arise from the proposed mitigation measures and to identify constraints associated with the mitigation measures recommended in the EIA study, as well as the provision of any necessary modification;

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

(xviii) to identify any additional studies necessary to implement the mitigation measures 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 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) potential air quality impacts on existing and planned air sensitive receivers (ASRs)) due to the construction and operation of the Project;

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

(iii) potential hydrodynamic and water quality impacts on water sensitive receivers (WSRs) and relevant water system(s) in the vicinity due to the construction and operation of the Project;

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

(v) potential extent of land contamination within Project Area for development works and relevant mitigation measures;

(vi) potential ecological impacts (terrestrial and marine) due to the construction and operation of the Project;

(vii) potential fisheries impact due to the construction and operation of the Project;

(viii) potential landscape impact due to the construction and operation of the Project;

(ix) potential visual impact due to the operation of the Project;

(x) potential cultural heritage impacts due to the construction and operation of the Project;

(xi) potential hazard to life impact during the construction and operation of the Project;

(xii) potential cumulative environmental impacts of the Project through interaction or in combination with other existing, committed and planned projects that may have a bearing on the environmental acceptability of the Project.

3.3 Description of the Project

3.3.1 Purpose(s) and Objectives of the Project

The Applicant shall provide information on the Project, including the purpose(s), 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 the proposed alignment, design, scale/size, construction methods, sequence of construction works and other major activities involved in the Project, using diagrams, plans and/or maps as necessary. The estimated duration of the construction phase and operational phase of the Project together with the programme within these phases shall be given. The water and/or land to be taken by the Project, construction sites, and any associated access arrangements, auxiliary facilities and landscaping areas shall be shown on a scaled map. The land uses of the Project shall be described and the different land use areas shall be demarcated as appropriate.

3.3.3 Background and History of the Project

The Applicant shall provide information on the site location and site history of the Project, interactions with other projects, and the consideration of different development options, taking into account the principles of avoidance, minimising and control of adverse environmental impacts. The options might include alignment, design, scale/size, construction methods and sequence of construction works for the Project. 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 shall be compared with those of the Project and with the likely future environmental conditions in the absence of the Project.

3.4 Technical Requirements

3.4.1 The Applicant shall conduct the EIA study to address the environmental aspects of the activities as described in 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 with 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 air quality impact as stated in Section 1 of Annex 4 and Annex 12 of the TM respectively.

3.4.4.2 The assessment area for the air quality impact assessment shall be defined by a distance of 500 metres from the boundary of the Project Area and the works of the Project as identified in the EIA 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 air 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 assessment of the air quality impact arising from the construction and operation of the Project shall follow the detailed technical requirements given in **Appendix B** of this EIA study brief.

3.4.5 Noise Impact

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

3.4.5.2 The assessment shall cover the potential noise impacts due to the construction and operation of the Project, including construction noise, road traffic noise, and fixed noise sources impacts on the existing, committed and planned NSRs reflected 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 the construction and operation stages of the Project shall follow the detailed technical requirements given in **Appendix C** of this EIA study brief.

3.4.6 Water Quality Impact

3.4.6.1 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.

3.4.6.2 The assessment area for the water quality impact assessment shall include areas within 500 metres from the boundary of the Project; and shall cover the Western Buffer Water Control Zone and other affected Water Control Zones as designated under the Water Pollution Control Ordinance (Cap. 358) and the Water Sensitive Receivers (WSRs) in the vicinity of the Project. The assessment area shall be extended to include other areas such as stream courses, existing and new drainage systems and other water system(s) in the vicinity, 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.

3.4.6.3 The water quality impact assessment for the construction and operation of the Project shall follow the detailed technical requirements given in **Appendix D** of this EIA study brief.

3.4.7 Waste Management Implications

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

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

3.4.8 Land Contamination

3.4.8.1 The Applicant shall follow the guidelines for evaluating and assessing potential land contamination 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 issues shall follow the detailed technical requirements given in **Appendix F** of this EIA study brief.

3.4.9 Ecological Implication (Terrestrial and Marine)

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

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

3.4.9.3 For marine ecological impact assessment, 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 and any other areas likely to be impacted by the Project.

3.4.9.4 The ecological impact assessment for the construction and operation of the Project shall follow the detailed technical requirements given in **Appendix G** of this EIA study brief.

3.4.10 Fisheries Impact

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

3.4.10.2 The assessment area for fisheries impact assessment 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 found also being impacted by the construction or operation of the Project during the course of the EIA study. Special attention should be given to potential loss or disturbance of fishing ground, fisheries habitat, important spawning grounds of commercial fisheries resources in northern Lantau waters, as well as water quality deterioration at sensitive receivers such as fish culture zone.

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** of this EIA study brief.

3.4.11 Landscape and Visual Impact

3.4.11.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing landscape and visual impacts as stated in Section 1 of Annex 10 and Annex 18 of the TM respectively, and the latest version of the EIAO Guidance Note "Preparation of Landscape and Visual Impact Assessment under the EIAO" published on the website of the Environmental Protection Department, unless otherwise agreed by the Director.

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

3.4.11.3 The landscape impact assessment for the construction and operation stages of the Project and the visual impact assessment for the operation stage of the Project shall follow the detailed technical requirements given in **Appendix I** of this EIA study brief.

3.4.12 Impact of Cultural Heritage

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

3.4.12.2 The assessment area for the cultural heritage impact assessment (CHIA) shall be defined by a distance of 300 metres from the boundary of the Project area. The CHIA shall include and a Built Heritage Impact Assessment (BHIA), an Archaeological Impact Assessment (AIA) and a Marine Archaeological Investigation (MAI) for construction and operation of the Project.

3.4.12.3 The CHIA for the construction and operation of the Project shall follow the detailed technical requirements of the BHIA, AIA and MAI shown in **Appendix J** and **Appendix J-1**of this EIA study brief.

3.4.13 Hazard To Life

3.4.13.1 The Applicant shall follow the criteria for evaluating hazard to life as stated in Section 2 of Annex 4 of the TM.

3.4.13.2 The hazard to life assessment for construction and operation of the Project shall follow the detailed technical requirements given in **Appendix K** of this EIA study brief.

3.5 Environmental Monitoring and Audit (EM&A) Requirements

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

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

3.5.3 The Applicant shall prepare a project implementation schedule (in the form of a checklist as shown in **Appendix L**) containing 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, such as alignment, design, scale, extent, land use and layout options as well as construction methods, disposal/treatment methods and sequences of works for the Project, with a view to avoiding, minimizing and mitigating adverse environmental impacts. A comparison of the environmental benefits and dis-benefits of applying different 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 findings of the EIA report, including baseline environmental information, the environmental situations with or without the Project, associated works, supporting facilities and essential infrastructures, key mitigated and unmitigated environmental impacts, and key recommended environmental mitigation measures so that the public can better understand the Project and the associated environmental issues. The 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 and the corresponding raw data with necessary setting(s) that enable full migration into EPD's platform 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 the Applicant for this EIA study brief during the course of 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-653/2023), 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

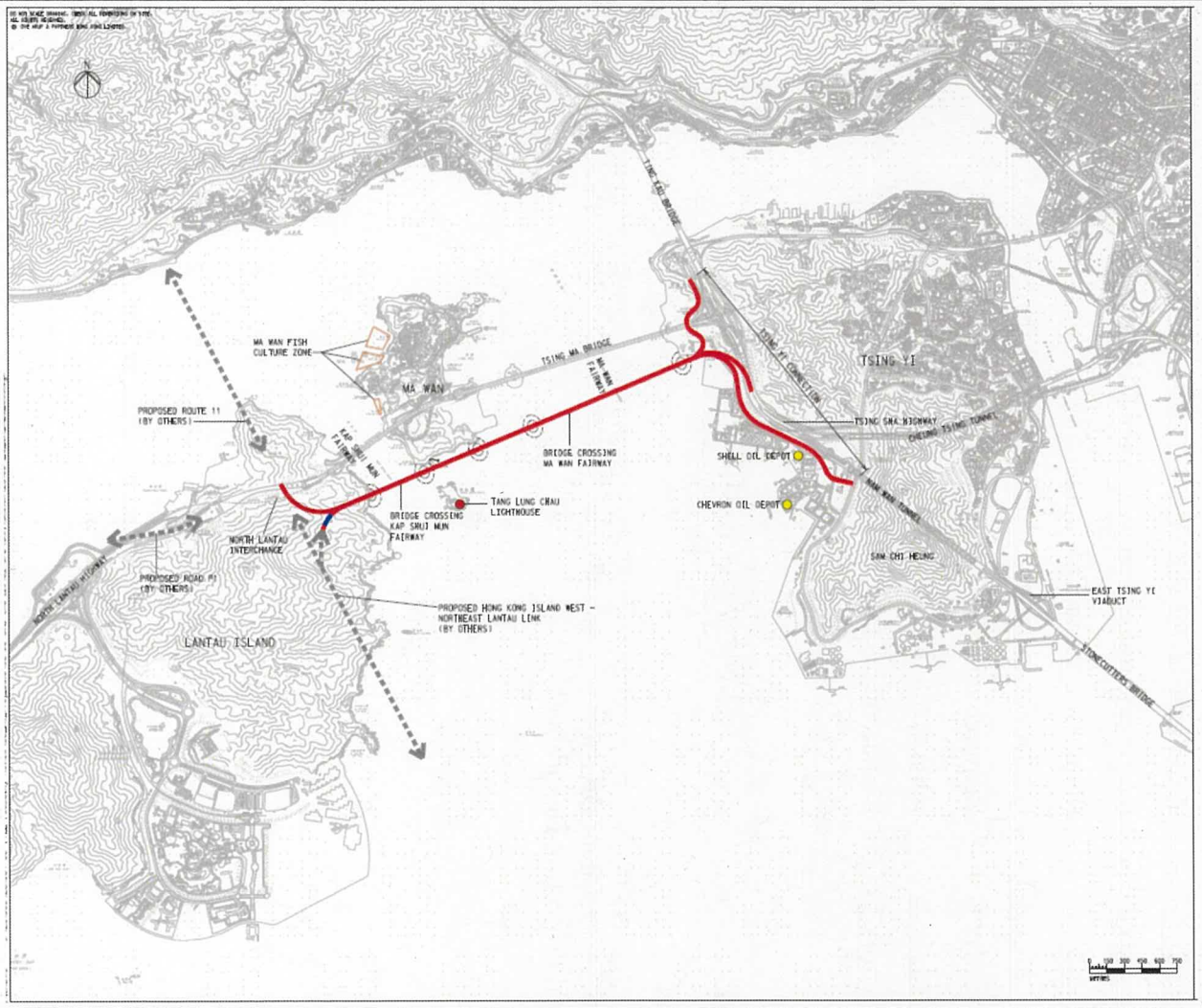
7.1 This EIA study brief includes the following appendices:

Appendix A – Project Location Plan
Appendix B – Requirements for 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 (Terrestrial and Marine)
Appendix H – Requirements for Fisheries Impact Assessment
Appendix I – Requirements for Landscape and Visual Impact Assessment
Appendix J – Requirements for Cultural Heritage Impact Assessment
Appendix J-1 – Guidelines for Marine Archaeological Investigation
Appendix K – Requirements for Hazard to Life Assessment
Appendix L – Implementation Schedule of Recommended Mitigation Measures
Appendix M – Requirements for EIA Report Documents

– END of EIA STUDY BRIEF –

June 2023
Environmental Assessment Division
Environmental Protection Department

Appendix A



LEGEND

- PROPOSED ELEVATED/ AT-GRADE ROAD (TENTATIVE ALIGNMENT)
- PROPOSED TUNNEL (TENTATIVE ALIGNMENT)
- MA WAN FISH CULTURE ZONE
- BUILT HERITAGE RESOURCES
- POTENTIALLY HAZARDOUS INSTALLATION
- POSSIBLE RECLAMATION AREA
- BRIDGE STRUCTURE

NOTE

RECLAMATION EXTENT WILL BE FURTHER REVIEWED AT THE INVESTIGATION AND DESIGN STAGE OF THE PROJECT.

Project Title: Tsing Yi – Lantau Link
工程項目名稱:青衣至大嶼山連接路

(This figure is prepared based on Plan 1 of Project Profile No.: PP-653/2023)
(本圖是根據工程項目簡介編號 PP-653/2023 圖則 1 編製)

EIA Study Brief No.: **ESB-359/2023**
環評研究概要編號 :

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 construction and operation stages 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, phasing programmes and alternative modes of operation to minimise the air quality impact during construction and operation stages of the Project.

   (iii) Presentation of background air quality levels in the assessment area for the purpose of evaluating the cumulative air quality impacts during construction and operation stages of the Project. Projection of future year background air quality can be extracted from "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 reflected 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 and 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. Examples of construction stage emission sources include reclamation, slope work, tunnel construction, and excavation, etc. Examples of operational stage emission sources include vehicles emissions from the roads and the road network within the assessment area, tunnel portals and ventilation buildings of the project, marine vessels, industrial emissions, etc. Confirmation regarding the validity of assumptions and the magnitude of activities (e.g. volume of construction material to be handled, marine traffic flow, etc.) shall be obtained from the relevant government departments/authorities, where applicable, and documented in the EIA report. Validity of the traffic flow and traffic speed prediction shall be confirmed with Transport Department.

(iii) Identification of existing and potential chimneys and obtainment of relevant chimney emission data in the assessment area, where appropriate, by carrying out a survey for assessing the cumulative air quality 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 effectively controlled. Construction dust assessment should be conducted qualitatively to ensure that the Air Pollution Control (Construction Dust) Regulation is complied with.

(ii) 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 minimise air quality impact arising from the construction machinery. 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.

(iii) 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 within the assessment area as defined in Section 3.4.4.2 of this study brief based on an assumed reasonably worst-case scenario under normal operating conditions of the Project.

(ii) If the assessment indicates likely exceedances of the recommended limits in the TM at the development and the identified ASRs, a quantitative assessment should be carried out to evaluate the operational phase air quality at the development and the identified ASRs. The Applicant shall follow the methodology set out in Section 5 below when carrying out the quantitative assessment.

(iii) If necessary, 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 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) Calculation of the relevant pollutant emission rates for input to the model and map(s) showing road links, marine transport route and emission sources shall be presented in the EIA report. A summary table of the emission rates with detailed calculations 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 air quality impact assessment, the air pollution impacts of future road and marine traffic shall be calculated based on the highest emission strength from the road vehicles and marine vessels in the assessment area within the next 15 years upon commissioning of the project. The Applicant shall demonstrate that the selected year of assessment represents the highest emission scenario given the combination of vehicular/marine emission factors and traffic flow for the selected year. 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. Vehicle emissions, including running, start/idling emission, at existing and future PTIs, depots and parking sites, if any, that would contribute significantly to the overall cumulative air quality impact at the development and the nearby ASRs shall be taken into account in the assessment. Unless otherwise agreed by the Director, the latest version of the EMFAC-HK model shall be used. Use of any alternatives to the EMFAC-HK model shall be agreed with the Director. The traffic forecast data and assumptions, such as the hourly traffic volume, average speed, vehicle composition, number of trips and soaking time data, 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, 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 dispersion 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 (referred in Section 2.3 of EPD's "Guidelines on Assessing the 'TOTAL' Air Quality Impacts")

located within 4 kilometres 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 development and the identified ASRs and compare these results against the criteria set out in Section 1 of Annex 4 in the TM. The predicted air quality impacts shall be presented in the form of summary table(s) and pollution contours to cover the whole assessment area, 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 over the whole assessment area 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 tunnels/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 due to these technical remedies 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 ASRs, on contour maps for reference.

6. Mitigation Measures for Air Quality Impact

6.1 Consideration for Mitigation Measures

6.1.1 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 including but not limited to road design measures (e.g. alternative road alignment to maximise separation distance from ASRs, roadside barrier/enclosure, etc.), pollution control technology measures (e.g. installation of air purification system at tunnel ventilation shaft, etc.), and traffic management measures (e.g. setting up restriction zone for heavy duty vehicles, low/zero emission zone for existing trunk roads and roads of the project, etc.) 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.

6.2 Evaluation of Residual Air Quality Impact

6.2.1 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

7.1 All input and output file(s) of model run(s) including those files for the generation of the pollution contours and emission calculations worksheets 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 shall refer to the latest version of guidelines published on the website of the Environmental Protection Department:

https://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 sources. The respective noise environment shall be documented in the EIA report.

2 Construction Noise Impact Assessment

2.1 Construction Noise Impact Assessment Methodology

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

2.1.2 The Applicant shall conduct a qualitative assessment in the EIA to demonstrate no adverse construction noise impact would be associated with the project by adopting quieter construction method and equipment during the construction stages. The Applicant shall firstly identify the major noise sources/activities, then propose the corresponding quiet construction methods and noise mitigation measures, and commit to submitting a Construction Noise Management Plan (CNMP) to the Director.

2.2 Identification of Construction Noise Impact

2.2.1 *Identification of Assessment Area and Noise Sensitive Receivers (NSRs)*

(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 the existing, committed and planned NSRs in the assessment area and select assessment points to represent identified NSRs for carrying out construction noise impact assessment.

(c) The assessment points shall be confirmed with the Director before commencing the 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 an inventory of noise sources for representative construction equipment for the purpose of construction noise impact assessment. Validity of the inventory shall be confirmed with the relevant government departments, authorities or the Applicant's construction professionals and documented in the EIA report.

2.3 Mitigation of Construction Noise Impact

2.3.1 The Applicant shall consider and evaluate the application of direct mitigation measures including but not limited to, quieter construction method and equipment, barriers, enclosures, etc. The feasibility, practicability, programming and effectiveness of the recommended mitigation measures shall be qualitatively assessed. Any direct mitigation measures recommended shall be well documented in the report. Specific reasons for not adopting certain direct mitigation measures to maximise the protection for the NSRs as far as possible should be clearly substantiated and documented in the EIA report.

2.4 Construction Noise Management Plan (CNMP)

2.4.1 The Applicant shall propose to submit a CNMP to the Director. The CNMP shall contain the quantitative construction noise impact assessment, the adopted quieter construction method and equipment, noise mitigation measures and the construction noise impact monitoring and audit programme, with reference to the updated and identified noise mitigation measures once available and in any case before the tender invitation if there is any change to the construction noise mitigation measures recommended in the EIA report and before the commencement of construction of the project. Any technical constraint that would hinder the use of these quieter construction method and equipment shall be evaluated and clearly recorded in the assessment.

2.4.2 The CNMP shall include an implementation schedule clearly listing out the mitigation measures, the implementation party, location and timing of implementation. Mitigation measures recommended and requirements specified in the CNMP shall be fully implemented.

3 Road Traffic Noise Impact Assessment

3.1 Road Traffic Noise Impact Assessment Methodology

3.1.1 The Applicant shall calculate traffic noise levels in respect of each road section (within the meaning of Items A.1 and A.8 under Part I, Schedule 2 of the EIAO and other road sections) and the overall noise levels from combined road sections (including existing, new/altered road sections) at the NSRs. The Applicant shall propose the assessment methodology for agreement of the Director before commencing the assessment in accordance with Section 5.1 of Annex 13 of the TM.

3.1.2 *Input Data of Computational Model*

The Applicant shall provide the input data set of the road traffic noise computational model adopted in the assessment for various scenarios. The data shall be in electronic text file (ASCII format) containing road segments, barriers and NSRs 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 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.

(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 shall use the relevant land use and planning parameters and conditions to work out representative site layouts for road traffic noise impact assessment purpose. However, such parameters and conditions together with the representative layouts and any constraints identified shall be confirmed with the relevant responsible parties including Planning Department and Lands Department.

3.2.2 *Inventory of Noise Sources*

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

(b) Validity of the traffic flow prediction of road sections for the purpose of road traffic noise impact assessment shall be confirmed with Transport Department and documented in the EIA report.

3.3 Prediction and Evaluation of Road Traffic Noise Impact

3.3.1 *Scenarios*

3.3.1.1 The Applicant shall quantitatively assess the road traffic noise impact of the Project, with

respect to the criteria set in Annex 5 of the TM, of unmitigated scenario and mitigated scenario at assessment year(s). The assessment year(s) shall be made reference to Section 5.1 in Annex 13 of the TM.

3.3.1.2 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:

(i) unmitigated scenario at assessment year(s);
(ii) mitigated scenario at assessment year(s);
(iii) prevailing scenario for indirect mitigated measures eligibility assessment; and

3.3.2 *Prediction of Noise Impact*

(a) The Applicant shall present the predicted noise levels in L_{10} (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 the surrounding 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 of the TM, the Applicant shall consider and evaluate direct mitigation measures including but not limited to low noise road surface, noise barrier/enclosure, screening by noise tolerant building, 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 NSRs that will be benefited from and be protected by the provision of direct mitigation measures should be provided. The total number of other NSRs that will still be exposed to noise above the criteria with the implementation of the recommended direct mitigation measures shall be quantified.

(c) For planned noise sensitive uses which will still be affected even with practicable direct mitigation measures at source in place, the Applicant shall propose, evaluate and confirm the practicability of additional direct mitigation measures within the planned noise sensitive uses and shall make recommendations on how these noise sensitive uses will be designed for the information and agreement of relevant parties.

(d) The Applicant shall take into account agreed environmental requirements /constraints identified in the EIA study to assess the development potential of concerned sites which

shall be made known to the relevant parties.

3.4.2 *Indirect Mitigation Measures*

(a) Upon exhaust of direct mitigation measures, where the predicted road traffic noise impact still exceeds the criteria set in Table 1A of Annex 5 of the TM, the Applicant shall consider indirect mitigation measures in the form of window insulation and air-conditioning and evaluate in accordance with Section 6.2 in Annex 13 of the TM.

(b) The Applicant shall identify and estimate the total number of existing dwellings, classrooms and other noise sensitive elements which may qualify for indirect mitigation measures, the associated costs and any implications for such implementation.

(c) For the purpose of determining eligibility of the affected premises for indirect mitigation measures, reference shall be made to methodology accepted by the 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

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

4 Fixed Noise Sources Impact Assessment

4.1 Fixed Noise Sources Impact Assessment Methodology

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

4.1.2 The Applicant shall conduct a qualitative assessment to demonstrate no adverse fixed noise sources impact would be associated with the project by committing to adopt appropriate noise mitigation measures during the operation periods. The Applicant shall identify the major noise sources/activities, and commit to submitting a Fixed Noise Source Management Plan (FNMP) to the Director.

4.2 Identification of Fixed Noise Sources Impact

4.2.1 *Identification of Assessment Area and Noise Sensitive Receivers (NSRs)*

(a) The Applicant shall propose the assessment area for agreement of the Director before commencing the assessment. The assessment area for the fixed noise sources 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 the existing, committed and planned NSRs in the assessment area and select assessment points to represent identified NSRs for carrying out the fixed noise sources impact assessment described below.

(c) The assessment points shall be confirmed with the Director prior to the commencement of the 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 shall use the relevant land use and planning parameters and conditions to work out representative site layouts for fixed noise sources impact assessment purpose. However, such parameters and conditions together with representative site layouts and 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 an inventory of noise sources for fixed noise sources impact assessment. The inventory of noise sources shall include noise associated with any permanent or temporary industrial noise sources.

(b) The Applicant shall provide document or certificate, where applicable, with a methodology 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 where applicable and documented in the EIA report.

4.3 Mitigation of Fixed Noise Sources Impact

4.3.1 The Applicant shall consider and evaluate the application of direct mitigation measures including but not limited to quieter equipment, silencer, barrier, enclosures, screening by noise tolerant building, etc. The feasibility, practicability, programming and effectiveness of the recommended mitigation measures shall be qualitatively assessed. Any direct mitigation measures recommended should be well documented in the report. Specific reasons for not adopting certain direct mitigation measures to maximise the protection for the NSRs as far as possible should be clearly substantiated and documented in the EIA report.

4.4 Fixed Noise Source Management Plan (FNMP)

4.4.1 The Applicant shall propose to submit a FNMP to the Director. The FNMP will contain the quantitative fixed noise source impact assessment, noise mitigation measures and the fixed noise source impact monitoring and audit programme, with reference to the updated and identified inventories once available and in any case before commencement of construction of the Project.

4.4.2 The FNMP shall include an implementation schedule clearly listing out the mitigation measures, the implementation party, location and timing of implementation. Mitigation measures recommended and requirements specified in the FNMP shall be fully implemented.

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**.

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

   (i) the potential hydrodynamic impact and water quality impact due to any reclamation, breakwater and change in coastline;

   (ii) the water quality impacts arising from marine works including but not limited to impacts on suspended solid level, dissolved oxygen concentration, contaminant and nutrient release and those specified in the ProPECC Practice Note 1/94 on "Construction Site Drainage", during construction;

   (iii) the water quality impacts of surface runoff containing oil/grease and suspended solids during the operational stage;

   (iv) the water quality impacts on bathing beach, fish culture zone, intertidal habitat, and other water sensitive receivers which may be affected by the Project;

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

   (i) collect and review background information on affected existing and planned water systems, their respective catchments and sensitive receivers which might be affected by the Project;

   (ii) 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 system(s). The Applicant should refer to, *inter alia*, those developments and uses earmarked on the relevant Outline Zoning Plans, Development Permission Area Plans, Outline Development Plans and Layout Plans, and any other relevant published land use plans, including plans and drawings published by Lands Department and any land use and development applications approved by the Town Planning Board;

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

(v) review the specific construction methods and configurations, and operation of the Project to identify any change of shoreline or bathymetry and change of flow regimes; identify and predict the likely water quality impacts arising from the Project;

(vi) identify any alteration of any water courses, natural streams, ponds, wetlands, 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 assessment area;

(vii) identify and quantify existing and likely future water pollution sources, including point discharges and non-point sources discharges to the water system(s), dredging and filling for reclamation construction and marine works; sewage from workforce and future occupants/users, thermal/ cooling water discharge, discharge containing biocide (if any), dredging (including possible maintenance dredging), and other polluted discharge 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 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 system(s) and its/their sensitive receivers due to those alterations and changes identified in (vi) above, and the pollution sources identified in (vii) above. Possible impacts include change in hydrology, flow regime, water quality and release of contaminants during dredging, filling and other 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 that may have a bearing on the environmental acceptability of the Project. The Applicant shall propose the assessment boundary of cumulative impact for agreement of the Director;

(xi) analyse 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 during construction and operation of the Project as appropriate;

(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

1. Water Quality Modelling Plan

(i) The Applicant shall submit a Water Quality Modelling Plan for agreement with EPD before commencement of modelling assessment. The Plan shall demonstrate that the models meet the requirements as stipulated under the sections of Modelling Software, Model Details – Setup, Calibration and Validation, and Model Details – Simulation (Sections 2 to 4) in this Appendix. The Plan shall also set out the methodology for the modelling assessment in accordance with the requirements as stipulated under the Modelling Assessment section (Section 5) in this Appendix.

2. Modelling Software

(i) The modules, D-Flow Flexible Mesh and D-Water Quality, of the Delft3D Flexible Mesh (DFM) Suite modelling software shall be used to simulate the far field hydrodynamic and water quality conditions of the water bodies under different representative scenarios of this Study.

(ii) An initial dilution model shall be used to characterize the initial mixing of the effluent discharge, and to estimate the terminal level and size of the plume to be fed into the far field water quality model where necessary. The initial dilution model shall have been proven with successful applications locally and overseas (such as Cormix and VISJET).

3. Model Details – Setup, Calibration and Validation

(i) The Applicant shall locally refine the DFM model provided by EPD (HK-DFM Model, version 202210 or later, available in the Centralised Environmental Database of EPD), and update the model input such as pollution loading inventory, coastline, bathymetry, and other model configurations, where necessary, to suit the needs of this Study.

(ii) The HK-DFM Model refined by the Applicant shall be properly calibrated and validated against the latest available field data and checked against the original HK-DFM Model before use in this Study. The field data set for calibration and validation shall be agreed with EPD.

(iii) If nested modelling is considered to be absolutely necessary, the Applicant shall use the refined HK-DFM Model (refers to paragraphs (i) and (ii) of Section 3 of this Appendix) to generate the open boundary conditions for the nested / detailed local model as appropriate. The Applicant shall demonstrate that the use of the nested / detailed local model will not eliminate the essential features for hydrodynamic and water quality processes in the area of concern. In addition, the Applicant shall demonstrate to the satisfaction of EPD that the results of the nested / detailed local model at all key monitoring points are highly consistent with and closely resembling those of the refined HK-DFM Model in selected scenario(s) for the Study (e.g. the baseline scenario) as well as available field data.

(iv) In addition to the model simulation of selected study period including calibration and validation runs, proper model spin-up shall be carried out to ensure that the model results have largely stabilised. Spin-up test results shall be provided to demonstrate that the model is sufficiently spun up to minimize any numerical artifacts from initial conditions.

(v) For the purpose of calibration and validation, the model shall run for at least a real sequence of 15-day spring-neap tidal cycle (excluding model spin up) each for the dry and the wet seasons.

(vi) The hydrodynamic model shall satisfactorily reproduce the observed variations of tide level and tidal current (in terms of magnitude and direction), and the temporal variations of salinity along the water column. In general, model calibration and validation shall achieve the following level of fitness with field data as far as possible.

Parameters	Level of fitness with field data
(a) tidal elevation (@)	< 8 %
(b) maximum phase error at high water and low water	< 20 minutes
(c) maximum current speed deviation	< 30 %
(d) maximum phase error at peak speed	< 20 minutes
(e) maximum direction error at peak speed	< 15 degrees
(f) 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.

4. Model Details – Simulation

(i) 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, salinity, temperature, suspended solids, contaminants release of dredged and disposed material, air-water exchange, *E. coli* and benthic processes. Reference shall be made to Water Quality Objectives (WQOs) of the corresponding Water Control Zone (WCZ) as appropriate.

(ii) The model shall take into account the processes of settling, deposition, erosion and re-suspension when assessing impacts of sediment loss due to marine works. 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.

(iii) The model shall incorporate the physical processes of thermal discharge and flow abstraction, buoyancy effect of the thermal plume, and surface heat exchange when assessing impacts of thermal discharge. Dispersion of biocides in the discharge shall also be simulated with appropriate decay rates.

(iv) In general, grid size within and around the study area of the Project shall be less than 400 m in open waters and less than 75 m around discharge points or 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.

(v) The pollution load inventory for water quality modelling shall include both the background and project pollution loads. The Applicant may adopt the pollution load inventory provided by EPD as the background pollution loads. Any update or revision to the background pollution loads as well as the project pollution loads shall be justified and agreed with EPD.

5. Modelling Assessment

(i) The assessment shall include both the construction and operation stages of the Project. Potential impacts of the water quality due to the Project, and potential changes in hydrodynamic regime due to any breakwater construction, reclamation, other works involving coastline and bathymetry

changes, and/or major discharges (such as brine discharge from desalination plants) under the Project shall be assessed. 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 setup.

(ii) If applicable, the assessment shall cover accidental spillage associated with the Project. Potential locations, quantities and rates of spill shall be identified and quantified. The spill modelling shall cover combinations of different tides, wind and seasonal conditions. The methodology for modelling spill and scenarios to be covered should be agreed with EPD.

(iii) The water quality model shall run for a complete year to assess water quality impacts during operation stage of the Project. Construction stage impacts, thermal discharge, and floating refuse and debris entrapment, where appropriate, shall be assessed by simulating at least a 15-day spring-neap tidal cycle in both the dry and wet seasons.

(iv) For temporary discharges via the emergency outfall, the potential affected area and sensitive receivers, and the associated impacts shall be assessed using modelling. The Applicant shall estimate the temporary discharge loading, pattern and duration. The worst case scenario, such as discharge near slack water of neap tide, shall be simulated. The simulation period shall be at least a 15-day spring-neap tidal cycle in both the dry and wet seasons, and long enough for the recovery of the receiving water to the status before the discharge. Detailed methodology shall be agreed with EPD.

(v) Compliance of WQOs and other relevant criteria in the relevant WCZs during both the construction and operation stages of the Project shall be assessed.

(vi) Any changes in hydrodynamic regime shall be assessed with the model run for at least a 15-day spring-neap tidal cycle in both the dry and wet seasons. Daily erosion/sedimentation rate on identified sensitive receivers shall be computed and assessed with relevant criteria.

(vii) The impacts of water quality and/or hydrodynamic changes on identified sensitive receivers shall be assessed.

(viii) Cumulative impacts due to other projects, activities or pollution sources within a boundary to be agreed with the EPD shall also be predicted and quantified.

(ix) If nested modelling is adopted (paragraph (iii) of Section 3 of this Appendix) and the modelling results indicates that certain scenarios are sensitive/critical, e.g. where the predicted water quality only marginally meets the WQOs, the Applicant may be required to verify the findings from the nested model by re-running the identical scenarios using the refined HK-DFM Model (refers to paragraphs (i) and (ii) of Section 3 of this Appendix), if deemed necessary by EPD.

(x) 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 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 operational 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, sludge and screenings from sewage treatment works and other wastes which will be generated during construction and operational stages.

(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 fully evaluated. Measures that can be taken in the planning and design stages (e.g. by modifying the design approach) and in the construction stage for maximising 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 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 item (v) below.

(iv) The EIA report shall 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 wastes identified; and

(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.

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 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 Land Contamination Assessment

1. The Applicant shall identify the potential land contamination site(s) within the entire Project Area (Appendix A refers) and, if any, within the boundaries of associated areas (e.g. work areas) of the Project.

2. The Applicant shall provide a clear and detailed account of the present land uses (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 of the TM is identified, the Applicant shall carry out the land contamination assessment as detailed below and propose measures to avoid disposal:

   (i) The Applicant shall conduct a site appraisal to identify the potential contamination sources that may have impacted the Project site.

   (ii) If potential land contamination sources are identified in the Project Area, the Applicant shall conduct site investigation for contamination 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 endorsement. The Applicant shall remediate the contaminated land or site(s) according to the endorsed RAP, and a Remediation Report (RR) to demonstrate completion of remediation should be prepared and submitted to the Director for endorsement prior to the commencement of any development or redevelopment works within the DA. The CAR and RAP, if available, 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 site appraisal 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 site appraisal, CAR, RAP and RR as soon as these sites become accessible.

Appendix G

Requirements for Ecological Impact Assessment (Terrestrial and Marine)

The ecological impact assessment shall include the following:

1. The Applicant shall examine the flora, fauna and other components of the ecological habitats within the assessment area. The aim shall be to protect, maintain or rehabilitate the natural environment. In particular, the Project shall avoid or minimise impacts on recognised sites of conservation importance and other ecologically sensitive areas and species of conservation importance. The assessment shall identify and quantify as far as possible the potential ecological impacts associated with the Project, both directly by physical disturbance and indirectly by potential impacts such as change of water quality and hydrodynamic regime to the natural environment and the associated wildlife groups and habitats/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.

   (ii) evaluate the information collected, identify any information gap relating to the assessment of potential ecological impacts to terrestrial and marine environment, and determine the ecological field surveys and investigations that are needed for a comprehensive impact assessment as required under the following Sections;

   (iii) carry out any necessary ecological field surveys with a duration of at least nine months covering both the wet and dry seasons, and investigation to verify the information collected, fill in the information gaps as identified under sub-section (ii) above, if any, and to fulfil the objectives of the EIA study. The field surveys shall cover flora, fauna and any other habitats/species of conservation importance, and shall include intertidal survey, benthic survey, and underwater dive survey for coral communities and associated species;

   (iv) establish the ecological profile of the assessment area based on information collected in the tasks mentioned in sub-sections (i) to (iii) above, and describe the characteristics of each habitat found, the data set should be comprehensive and representative, 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 recognised sites of conservation importance and other ecologically sensitive areas, and assessment of whether these sites/areas will be affected by the Project;

      (b) habitat maps of suitable scale (1:1000 to 1:5000) showing the types and locations of habitats and species of conservation interest in the 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 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 Lists;

(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) woodlands;

(b) natural streams and associated riparian habitats;

(c) vertebrates (e.g. avifauna, mammals, freshwater fish, herpetofauna);

(d) macroinvertebrates (e.g. butterflies, odonates, fireflies, freshwater invertebrates);

(e) the intertidal, subtidal soft-bottom and hard-bottom habitats (e.g. coral communities); and

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

(vi) using suitable methodologies (including but not limited to those adopted in other relevant EIA studies in Hong Kong), and considering any works activities from other projects reasonably likely to occur at the time, identify and quantify as far as possible any direct (e.g. loss of habitats), indirect (e.g. changes in water qualities, hydrodynamics properties, hydrology, noise and other disturbance generated by the construction and operational activities, etc.), on-site, off-site, primary, secondary and cumulative ecological impacts on the wildlife groups and habitats identified such as destruction of habitats, potential diversion or modification of stream courses, disturbance to wildlife, reduction of species abundance/diversity, loss of feeding and breeding grounds, reduction of ecological carrying capacity and habitat fragmentation and any other possible disturbance caused by the Project, in particular the following:

(a) loss of habitats as mentioned in Section (v) above;

(b) disturbance to animal and plants, especially those as mentioned in Section (v) above;

(c) indirect impacts due to potential changes in the water quality, hydrodynamics properties, sedimentation hydrology as a result of surface run-off and discharges on habitats as mentioned in Section (v) above during the construction and operation stages of the Project; and

(d) cumulative impacts due to other planned and committed concurrent development projects at or near the Project Area.

(vii) evaluate the 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;

(viii) recommend possible and practicable mitigation measures (such as alternative design and configuration of the Project and modification/change of construction methods, etc.) to avoid, minimise and/or compensate for the adverse ecological impacts identified during construction and operation of the Project;

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

(x) determine and quantify as far as possible the residual ecological impacts after implementation of the proposed mitigation measures;

(xi) 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

(xii) 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 information gap and conduct field surveys to collect adequate baseline information taking into account the relevant marine works. The surveys to be conducted for the study shall include fisheries resources surveys for at least 6 months covering both wet and dry seasons and fishing activity surveys for 12 months within the study area.

2. The fisheries impact assessment shall cover any potential direct/indirect, on-site/offsite, short-term/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/production;

   (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, onsite/offsite impacts on fisheries (e.g. loss or disturbance of fishing ground, fisheries production and operations, fisheries resources and habitats, important spawning grounds of commercial fisheries resources in northern Lantau waters, as well as impact on hydrodynamics and water quality deterioration at sensitive receivers such as Fish Culture Zones;

   (vi) evaluation of cumulative impacts on fisheries;

   (vii) where necessary, proposals of feasible, practicable and effective alternatives and/or mitigation measures; and

   (viii) review for the need of monitoring during the construction and operation phases of the Project and associated works and, if necessary, proposal for a monitoring and audit programme.

Appendix I

Requirements for Landscape and Visual Impact Assessment

1. A system shall be derived for judging the landscape and visual impact significance as required under the Annexes 10 and 18 of the TM and the latest version of the EIAO Guidance Note "Preparation of Landscape and Visual Impact Assessment under the EIAO" published on the website of the Environmental Protection Department, unless otherwise agreed by the Director. Landscape impact during both construction and operation phase and visual impact during operation phase within the assessment area shall be assessed. 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 including those landscape design proposed under the Project. 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 and qualify 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. Broad brush tree and vegetation survey and survey on Old and Valuable Trees and trees of particular interest within the assessment area shall be carried out and the impacts on them, in particular flora species of conservation importance regardless of size, shall also 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 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. Prior to the Landscape and Visual Impact Assessment (VIA), the selection of viewpoints/vantage points shall be agreed with Planning Department and the Director;

   (iv) evaluation of the magnitude of change in terms of visual composition, visual obstruction and visual change of the Project with the existing and planned visual context, and sensitivity of viewers in terms of types of viewers and value of existing views;

(v) the visual impact of the Project with and without mitigation measures during operation phase 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, layout, development options, alignment, design, built-form and construction methods that would avoid or reduce the identified landscape and visual impacts shall be considered and evaluated for comparison before adopting other mitigation or compensatory measures to alleviate the impacts. The applicant shall recommend mitigation measures which shall not only focus on damage reduction but also potential enhancement of existing landscape and visual quality of the area. The recommendations shall also be illustrated in landscape design and landscape/visual impact mitigation measure plan.

5. The mitigation measures shall include preservation of vegetation and natural landscape resources (e.g. transplanting of trees in good condition and value), provision of buffer planting, re-vegetation of disturbed area, woodland restoration, compensatory planting, erection of decorative screen hoarding compatible with surrounding setting, provisioning/reprovisioning of amenity areas and open spaces, design and layout of structures, façade treatment, creation of interesting landscape or visual features 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 implementation of the Project. Agreement from relevant authorities responsible for funding, implementation, management and maintenance of proposed mitigation measures have to be obtained before including into the LVIA. A practical programme for the implementation of the recommended measures shall be provided. If any noise barriers/enclosures are proposed, the choice of their colours, design and materials should be compatible with the surrounding buildings and development context and their aesthetic designs should be considered.

6. Annotated illustration materials 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 fully illustrate the landscape and visual impacts of the Project. The landscape and visual impacts of the Project with and without mitigation measures at operation stage 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), unless otherwise agreed by the Director, by computer-generated photomontage so as to demonstrate the comparison of scenarios with and without the Project and the effectiveness of the proposed mitigation measures across time. Computer graphics shall be compatible with Microstation DGN file format. The Applicant shall record the technical details in preparing the illustrations, which may need to be submitted for verification of the accuracy of the illustrations.

Appendix J

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 possible direct and indirect impacts on the identified built heritage items. The impacts include visual impacts, impacts on the fung shui/visual corridor of the historic buildings and structures through change of water-table, vibration caused by the Project. Assessment of impacts on cultural heritage shall also take full account of, and allow where appropriate, the Guidelines for Landscape and Visual Impact Assessment of Annex 18 of the TM. The Applicant shall demonstrate that 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 appropriate protective/monitoring/mitigation measures in accordance with the assessment results and agreed by the Antiquities and Monuments Office (AMO). A checklist including 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 AMO 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 archaeologist(s) shall conduct archaeological investigations to assemble data. The archaeologist(s) shall obtain licence(s) from the Antiquities Authority under the Antiquities and Monuments Ordinance (Cap. 53) prior to the commencement of archaeological investigation(s). 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.

If archaeological investigation is required, it shall follow detailed technical requirement to be given by AMO and the Director on archaeological survey, archaeological report and handling of archaeological finds and archives. The Applicant shall draw necessary reference to relevant sections of the "Guidelines for Cultural Heritage Impact Assessment" issued by the AMO for detailed requirement.

3. Marine Archaeological Investigation (MAI)

(a) The Applicant shall engage a qualified marine archaeologist to conduct a marine archaeological review based on the best available information to identify whether there

is any potential existence of sites or objects of cultural heritage within the seabed that will be affected by the marine works of the Project, whether the identified issues can be mitigated. The review can take into account the scope and nature of proposed marine works, the results of previous marine archaeological investigations, the dredging history and other diving records, etc. The assessment area shall include areas to be affected by the marine works of the Project.

(b) A MAI shall be carried out to ascertain the archaeological value of the affected seabed area. The Applicant shall propose a programme of investigation, including the scope of works, methodology and time schedule, etc. for agreement with the Director. The MAI shall be carried out by a qualified marine archaeologist who shall obtain a licence from the Antiquities Authority under the provision of the Antiquities and Monuments Ordinance (Cap. 53) for the marine archaeological work. If significant archaeological remains are identified, and if they would be affected, strong justifications should be provided, and mitigation measures shall be designed and agreed by the AMO before implementation and implemented to the satisfaction of AMO.

4. The Applicant shall draw necessary reference to relevant sections of the "Guidelines for Marine Archaeological Investigation (MAI) (as at 4 May 2020)" issued by AMO in **Appendix J-1,** including those on archaeological survey, archaeological report, and handling of archaeological finds and archives, if found necessary in desk-top research results.

Appendix J-1

Guidelines for Marine Archaeological Investigation (MAI)
(As at 4 May 2020)

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 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 the 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 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.

5 Report

5.1 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 K

Requirements for Hazard to Life Assessment

Potentially Hazardous Installations (PHIs)

1. The Applicant shall carry out hazard assessment to evaluate potential hazard to life during construction and operation stages of the Project due to the PHIs (including but not limited to Chevron Hong Kong Limited Tsing Yi Terminal and Shell Tsing Yi Installation). The hazard assessment shall include the following:

   (i) Identify hazardous scenarios associated with the on-site transport, storage and use of dangerous goods in the PHIs and then determine 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(i) above, 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 to demonstrate the compliance with the Risk Guidelines.

Explosives

2. The Applicant shall investigate alternative construction methods to avoid the use of explosives. The hazard assessment shall include the following:

   (i) Identify hazardous scenarios associated with the use, transport and overnight storage of the explosives and then determine a set of relevant scenarios to be included in a QRA;

   (ii) Execute a QRA of the set of hazardous scenarios determined in 2 (i) above, 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 to demonstrate the compliance with the Risk Guidelines.

3. The hazard assessment shall also include a cumulative risk assessment of the Project, through interaction and in combination of the existing, committed and planned developments involving hazardous facilities in the vicinity of the Project.

4. The methodology to be used in the hazard assessments shall be consistent with previous studies having similar issues. Besides, the parameters used in the QRA for PHIs, especially those related to the traffic flow, shall be consulted and agreed with the PHIs owners.

Appendix L

Implementation Schedule of Recommended Mitigation Measures

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Measures & Main Concerns to Address	Who to Implement the Measure?	Location of the Measure	When to Implement the Measure?	What Standards or Requirements for the Measure to Achieve?

Appendix M

Requirements for EIA Report Documents

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

   (i) 30 copies of the EIA report and 30 copies of the executive summary (each bilingual in both English and Chinese) as required under Section 6(2) of the EIAO to be supplied at the time of application for approval of the EIA report.

   (ii) When necessary, addendum to the EIA report and the executive summary submitted in item (i) above as required under Section 7(1) of the EIAO, to be supplied upon advice by the Director for public inspection.

   (iii) 20 copies of the EIA report and 20 copies of the executive summary (each bilingual in both English and Chinese) with or without Addendum as required under Section 7(5) of the EIAO, to be supplied upon advice by the Director for consultation with the Advisory Council on the Environment.

2. In addition, to facilitate public inspection of EIA report via EIAO Internet Website, the Applicant shall provide electronic copies of both the EIA report and executive summary prepared in Hyper Text Markup Language (HTML) and in Portable Document Formats (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 executive summary shall be included in the beginning of the document. Hyperlinks to figures, drawings and tables in the EIA report and executive summary shall be provided in the main text from where respective references are made. The EIA report, including drawings, tables, figures and appendices shall be viewable by common web-browsers including the latest version of Microsoft Edge, Mozilla Firefox, Safari, Google Chrome or any web browsers 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.