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28 October 2019

By Registered Post & Fax 2638 5800

Drainage Services Department

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

Project Title: Drainage Improvement Works in Ta Kwu Ling
(Application No. ESB-322/2019)

I refer to your above application received on 16 September 2019 for an EIA Study Brief under Section 5(1)(a) of the EIA Ordinance.

In accordance with Section 5(7)(a) of the EIA Ordinance and after public inspection of the project profile, I issue the attached EIA Study Brief (No. ESB-322/2019) for your preparation of an EIA report.

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

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

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

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

Should you have any queries on the above application, please contact my colleague Mr. Lawrence LIU at 2835 1142.

Yours sincerely,

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

(K H T O)

Principal Environmental Protection Officer
for Director of Environmental Protection

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

ENVIRONMENTAL IMPACT ASSESSMENT STUDY BRIEF NO. ESB- 322/2019

**PROJECT TITLE: DRAINAGE IMPROVEMENT WORKS IN TA KWU LING
(hereinafter known as the “Project”)**

**NAME OF APPLICANT: DRAINAGE SERVICES DEPARTMENT
(hereinafter known as the “Applicant”)**

1. BACKGROUND

- 1.1 An application (No. ESB-322/2019) for an Environmental Impact Assessment (EIA) Study Brief under Section 5(1)(a) of the Environmental Impact Assessment Ordinance (EIAO) was submitted by the Applicant on 16 September 2019 with a project profile (No. PP-588/2019) (hereafter referred as the “Project Profile”).
- 1.2 The Project under the current application (hereinafter referred to as the “Project”) is to alleviate flooding problems in Ping Che / Ta Kwu Ling area by carrying out drainage improvement works on part of the Ping Yuen River (River Ganges) in Ta Kwu Ling, in accordance with the recommendation of “Drainage Master Plan (DMP) Study in the Northern New Territories”, which was completed in October 1999. The location of the Project is shown in Appendix A and the scope of works comprises:-
- (i) Improvement works to tributary sections of Ping Yuen River (River Ganges) - TKL04 (about 1.3km long) and TKL05 (about 2km long); and
 - (ii) Associated drainage facilities, including:-
 - (a) Drainage improvement works at Ping Yeung Village (about 750m long);
 - (b) Construction of road drainage system at Ping Che Road (about 700m long); and
 - (c) Re-provision of vehicular crossing and footbridges, if found necessary.
- 1.3 The Project is a designated project under Item I.1(b), Part 1, Schedule 2 of the EIAO : *A drainage channel or river training and diversion works which discharges or discharge into an area which is less than 300m from the nearest boundary of existing Sites of Special Scientific Interest, wild animal protection area and conservation areas.*
- 1.4 Pursuant to Section 5(7)(a) of the EIAO, the Director of Environmental Protection (the Director) issues this EIA Study Brief to the Applicant to carry out an EIA study.
- 1.5 The purpose of this EIA study is to provide information on the nature and extent of environmental impacts arising from construction and operation of the Project and the associated activities that will take place concurrently. This information will contribute to decisions by the Director on :
- (i) the acceptability of adverse environmental consequences that are likely to arise as a result of the Project and its staged implementation, as well as other interfacing projects at the vicinity 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 elements of the community and environment likely to be affected by the Project and associated works and/or likely to cause adverse impacts to the Project and associated works, including both the natural and man-made environment and the associated environmental constraints;
- (iii) to identify and quantify emission sources and determine the significance of impacts on sensitive receivers and potentially affected uses, and to propose measures to mitigate these impacts;
- (iv) to identify and quantify/ evaluate any potential loss or damage and other potential impacts to fisheries, flora, fauna and natural habitats and to propose measures to mitigate these impacts;
- (v) to identify and quantify waste management requirements and to propose measures to mitigate these impacts;
- (vi) to identify and quantify contaminated land within any Project area for development works, and to propose measures to avoid disposal of contaminated materials in the first instance;
- (vii) to identify and evaluate any potential landscape and visual impacts and to propose measures to mitigate these impacts;
- (viii) to identify and evaluate any negative impacts on sites of cultural heritage and/ or built heritage and to propose measures to mitigate these impacts;
- (ix) to propose measures/actions to avoid or minimise potential archaeological impacts if any archaeological remains are identified during the construction of the Project;
- (x) to propose the provision of infrastructure or mitigation measures to minimise pollution, environmental disturbance and nuisance during construction and operation of the Project and associated works;
- (xi) to investigate the feasibility, effectiveness and implications of the proposed mitigation measures;

- (xii) to identify, predict and evaluate the residual (i.e. after practicable mitigation) environmental impacts and the cumulative effects expected to arise during the construction and operation of the Project in relation to the sensitive receivers and potentially affected uses;
- (xiii) to identify, assess and specify methods, measures and standards to be included in the detailed design, construction and operation of the Project which are necessary to mitigate these residual environmental impacts and cumulative effects and reduce them to acceptable levels;
- (xiv) to 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;
- (xv) to identify, assess and evaluate the cumulative impacts arising from all the elements and works of the Project;
- (xvi) to design and specify environmental monitoring and audit requirements to ensure the implementation and the effectiveness of the environmental protection and pollution control measures adopted; and
- (xvii) to identify any additional studies necessary to implement the mitigation measures or monitoring and proposals recommended in the EIA report.

3. DETAILED REQUIREMENTS OF THE EIA STUDY

3.1 The Purpose

- 3.1.1 The purpose of this Study Brief is to set out the purposes and objectives of the EIA study, the scope of environmental issues which shall be addressed, the requirements that the EIA study shall need to fulfil, and the necessary procedural and reporting requirements. The Applicant shall demonstrate in the EIA report whether the criteria in the relevant sections of the Technical Memorandum on the Environmental Impact Assessment Process of the Environmental Impact Assessment Ordinance (hereinafter referred to as the "TM") are fully complied with.

3.2 The Scope

- 3.2.1 The scope of this EIA study shall cover the Project and associated works mentioned in Sections 1.2 of this EIA Study Brief. For the purpose of assessing whether the environmental impacts shall comply with the criteria of the TM, the EIA study shall address the key issues described below, together with any other key issues identified during the course of the EIA study:
 - (i) environmental benefits and dis-benefits of different development options and scenarios, design, and construction and desilting/ dredging (if any) methods of the Project with a view to deriving the preferred development option(s) that will avoid or minimise adverse environmental impact;

- (ii) potential water quality impacts during construction and operation of the Project on water system(s) including the Deep Bay Water Control Zone and relevant water sensitive receivers (WSRs), including but not limited to semi-natural/ natural watercourses/ streams/ channels within and near the Project area (e.g. Ping Yuen River (River Ganges) and Shenzhen River); and areas of ecological or conservation values, and capture and culture fisheries if found being impacted by the construction and/ or operation of the Project during the course of the EIA study;
- (iii) potential terrestrial and aquatic ecological impacts during construction and operation of the Project, in particular impacts on habitats including but not limited to semi-natural/ natural streams and watercourses; mangroves/ mudflats; ponds; fishponds; secondary woodlands; grasslands and plantation; Ping Che Egretty, Conservation Areas, SSSIs, recognised sites of conservation importance and other ecologically sensitive areas including those identified in Section 3.2.1 (ii) above, as well as species of conservation importance, including but not limited to *Mucuna championii*;
- (iv) potential fisheries impacts arising from the construction and operation of the project, including that on fish ponds, fishing ground and oyster culture area if found being impacted by the construction and/ or operation of the Project during the course of the EIA study;
- (v) to investigate the need for maintenance works during the operation stage. If affirmative, the frequency, the likely extent of maintenance works required and associated potential environmental impacts shall be assessed and quantified;
- (vi) potential waste management implications arising from the construction and operation of the Project, including handling and disposal of construction & demolition materials, spoil arising from the proposed river training works during construction and from maintenance works during operation; chemical waste, general refuse, and domestic and any other waste generated;
- (vii) potential extent of land contamination within any Project area for development works and relevant mitigation measures;
- (viii) potential landscape and visual impacts during the construction and operation of the Project, in particular the potential landscape impacts from the Project on the nearby sensitive receivers;
- (ix) potential air quality impacts on air sensitive receivers (ASRs) during construction and operation of the Project, in particular construction dust and odour impacts;
- (x) potential noise impacts on noise sensitive receivers (NSRs) during construction and operation of the Project, in particular construction noise generated by the Project;
- (xi) potential cultural heritage impacts due to the Project, in particular impacts on Built Heritage, including but not limited to Nos. 138-139 Ping Yeung, Sit Kin Ancestral Hall, Chan Ancestral Hall (Sit Wan Tso), Tin Hau Temple (Ping Che), Wing Kit Study Hall, Nos. 35-37 Fung Wong Wu village houses, Ng Ancestral

Hall (Fung Wong Wu), and Yeung Ancestral Hall (Fung Wong Wu); and sites of archaeological interest, including Ping Che Site of Archaeological Interest; and

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

3.3 Description of the Project

3.3.1 Purpose(s) and Objectives of the Project

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

3.3.2 Details of the Project

The Applicant shall indicate the nature and status of Project decision(s) for which the EIA study is undertaken. The Applicant shall describe Project details that may affect the potential environmental impacts, including but not limited to the siting, layout, scope, extent, shape and design, alignment, configuration, scale and size of the Project, facilities to be provided, construction and desilting/ dredging and disposal/ treatment methods, sequence and programme of construction works and other major activities involved in the construction and operation of the Project, and use diagrams, plans and/or maps as necessary. The estimated duration of the construction phase and operational phase, including any necessary maintenance works, of the Project together with the programme within these phases, where appropriate, shall be given. The land taken by the Project site, construction sites and any associated access arrangements, auxiliary facilities and landscaping areas shall be shown on a scaled map. The uses of the Project shall be described and the different land use areas shall be demarcated as appropriate.

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 to the maximum practicable extent. The options might include consideration of alternative siting, layout, scope, extent, shape, design, alignment, configuration, scale and size of the Project, facilities and supporting infrastructures at available locations, construction and desilting/ dredging and disposal/ treatment methods, sequence and programme of construction works and other major activities involved in the Project, any lessons learned from other similar projects, and its compatibility with the surrounding. Exploration of alternative drainage system designs should also include but not limited to different solutions to alleviate the flooding problem in the area and to avoid serious environmental and ecological impacts; other environmentally friendly design; and take into account established and new environmental friendly design concept to minimise potential environmental impacts. The key reasons for selecting the proposed 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 proposed option of the Project and with the likely future environmental conditions in the absence of the Project.

3.4 Technical Requirements

3.4.1 The Applicant shall conduct the EIA study to address all environmental aspects of the activities as described in the scope as set out above. The assessment shall be based on the best and latest information available during the course of the EIA study.

3.4.2 The Applicant shall include in the EIA report details of the construction programme and methodologies. The Applicant shall clearly state in the EIA report the time frame and works programmes of the Project and associated works and other concurrent projects, and assess the cumulative environmental impacts from the Project and associated works with all interacting projects, including staged implementation of the Project and associated works.

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

3.4.4 Water Quality Impacts

3.4.4.1 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.

3.4.4.2 The assessment area for the water quality impact assessment shall include areas within 500 metres from the boundary of the Project area. It shall cover the Deep Bay Water Control Zone and other affected Water Control Zones as designated under the Water Pollution Control Ordinance (Cap. 358), and water sensitive receivers in the vicinity of the Project, including but not limited to watercourses near the Project, such as Ping Yuen River (River Ganges) and Shenzhen River. The assessment area could be extended to include other areas found being impacted by the construction and/ or operation of the Project during the course of the EIA study, such as further downstream of Shenzhen River, other stream courses and Deep Bay, Sites of Special Scientific Interest (SSSI) (e.g. the Mai Po Marshes SSSI and Inner Deep Bay SSSI), Conservation Areas and ponds near the Project site and along Shenzhen River (including those at Yuen Leng Chai, Hoo Hok Wai, Ha Wan Tsuen, Sam Po Shue and Mai Po), the Mai Po Marshes Restricted Area, fishing ground and oyster culture area, wetland areas and the associated water systems in the vicinity of the Project.

3.4.4.3 The water quality impact assessment for the construction and operation, including any necessary maintenance works (e.g. desilting/ dredging), of the Project shall follow the detailed technical requirements given in Appendix B of this EIA Study Brief.

3.4.5 Ecological Impacts (Terrestrial and Aquatic)

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

3.4.5.2 The assessment area for the purpose of the terrestrial and aquatic ecological impact assessment shall include areas within 500 metres distance from the boundary of the Project and any other areas likely to be impacted by the Project. For aquatic ecology, the assessment area shall be the same as the water quality impact assessment described in Section 3.4.4.

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

3.4.6 **Fisheries Impacts**

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

3.4.6.2 The assessment area for the purpose of fisheries impact assessment shall include areas within 500 metres distance from the boundary of the Project area, which is the same as aquatic ecological impact assessment. This assessment area shall be extended to include other areas (e.g. active or abandoned fish ponds and/or associated water systems, fishing ground and oyster culture ground) if they are also found being impacted by the construction and/ or operation of the Project during the course of the EIA study. Special attention should be given to fish pond culture resources and activities, as well as any watercourses which serve as water sources for fish pond areas.

3.4.6.3 The fisheries 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 criteria and guidelines for evaluating and assessing potential land contamination issue(s) as stated in Sections 3.1 and 3.2 of Annex 19 of the TM.

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

3.4.9 **Landscape and Visual Impacts**

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

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

3.4.9.3 The landscape and visual 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 Air Quality Impacts

3.4.10.1 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.

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

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

3.4.11 Noise Impacts

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

3.4.11.2 The assessment area for the noise impact assessment shall be defined by a distance of 300 metres from the boundary of the Project and works of the Project as defined in the EIA. Assessment shall include construction noise impacts and confirm whether there are any adverse noise impacts during the operational phase on the existing, committed and planned Noise Sensitive Receivers (NSRs) earmarked on the relevant Outline Zoning Plans, Development Permission Area Plans, Outline Development Plans, Layout Plans and other relevant published land use plans, including plans and drawings published by the Lands Department and any land use and development applications approved by the Town Planning Board, in the vicinity of the Project.

3.4.11.3 The noise impact assessment for the construction and operation (if affirmative) of the Project shall follow the detailed technical requirements given in Appendix I of this EIA Study Brief.

3.4.12 Impacts on Cultural Heritage

3.4.12.1 The Applicant shall follow the criteria and guideline(s) for evaluating and assessing the cultural heritage impacts as stated in Annexes 10 and 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 a Built Heritage Impact Assessment (BHIA) and an Archaeological Impact Assessment (AIA) for the construction and operation of the Project. It shall also follow the detailed technical requirements given in Appendix J 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 operational phases of the Project and, if affirmative, to define the scope of the EM&A requirements for the Project in the EIA study.
- 3.5.2 Subject to the confirmation of the EIA study findings, the Applicant shall comply with the requirements as stipulated in Annex 21 of the TM.
- 3.5.3 The Applicant shall prepare a Project Implementation Schedule (in the form of a checklist as shown in Appendix K) containing all the EIA study recommendations and mitigation measures with reference to the implementation programme.

3.6 Presentation of Summary Information

3.6.1 Summary of Environmental Outcomes

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

3.6.2 Summary of Environmental Impacts

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

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

The EIA report shall contain a summary including the assessment methodologies and key assessment assumptions adopted in the EIA study, the limitations of these assessment 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 Options and Mitigation Measures

The EIA report shall contain a summary of alternative development options and measures considered during the course of the EIA study, including siting, layout, scope, extent, shape, design, alignment, configuration, scale and size of the Project, facilities and supporting infrastructures at available locations, construction and desilting/ dredging and disposal/ treatment methods, sequence and programme of construction works and other major

activities involved in the Project, with a view to avoiding, minimising and mitigating adverse environmental impacts. A comparison of the environmental benefits and dis-benefits of applying different development options and mitigation options shall be made. This summary shall cover the key impacts and shall also form an essential part of the executive summary of the EIA report.

3.6.5 Documentation of Public Concerns

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

4. DURATION OF VALIDITY

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

5. REPORTING REQUIREMENTS

- 5.1 In preparing the EIA report, the Applicant shall refer to Annex 11 of the TM for the contents of an EIA report. The Applicant shall also refer to Annex 20 of the TM, which stipulates the guidelines for the review of an EIA report. When submitting the EIA report to the Director, the Applicant shall provide a summary, pointing out where in the EIA report the respective requirements of this EIA Study Brief and the TM (in particular Annexes 11 and 20) have been addressed and fulfilled.
- 5.2 The Applicant shall supply the Director with hard and electronic copies of the EIA report and the executive summary in accordance with the requirements given in Appendix L of this EIA Study Brief. The Applicant shall, upon request, make additional copies of the above documents available to the public, subject to payment by the interested parties of full costs of printing.

6. OTHER PROCEDURAL REQUIREMENTS

- 6.1 If there is any change in the name of Applicant for this EIA Study Brief during the course of the EIA study, the Applicant must notify the Director immediately.
- 6.2 If there is any key change in the scope of the Project mentioned in Sections 1.2 and 1.3 of this EIA Study Brief and in Project Profile (No. PP-588/2019), the Applicant must seek confirmation from the Director in writing on whether or not the scope of issues covered by this EIA Study Brief can still cover the key changes, and the additional issues, if any, that the EIA study must also address. If the changes to the Project fundamentally alter the key scope of this EIA Study Brief, the Applicant shall apply to the Director for a fresh EIA Study Brief.

7. LIST OF APPENDICES

7.1 This EIA Study Brief includes the following appendices:

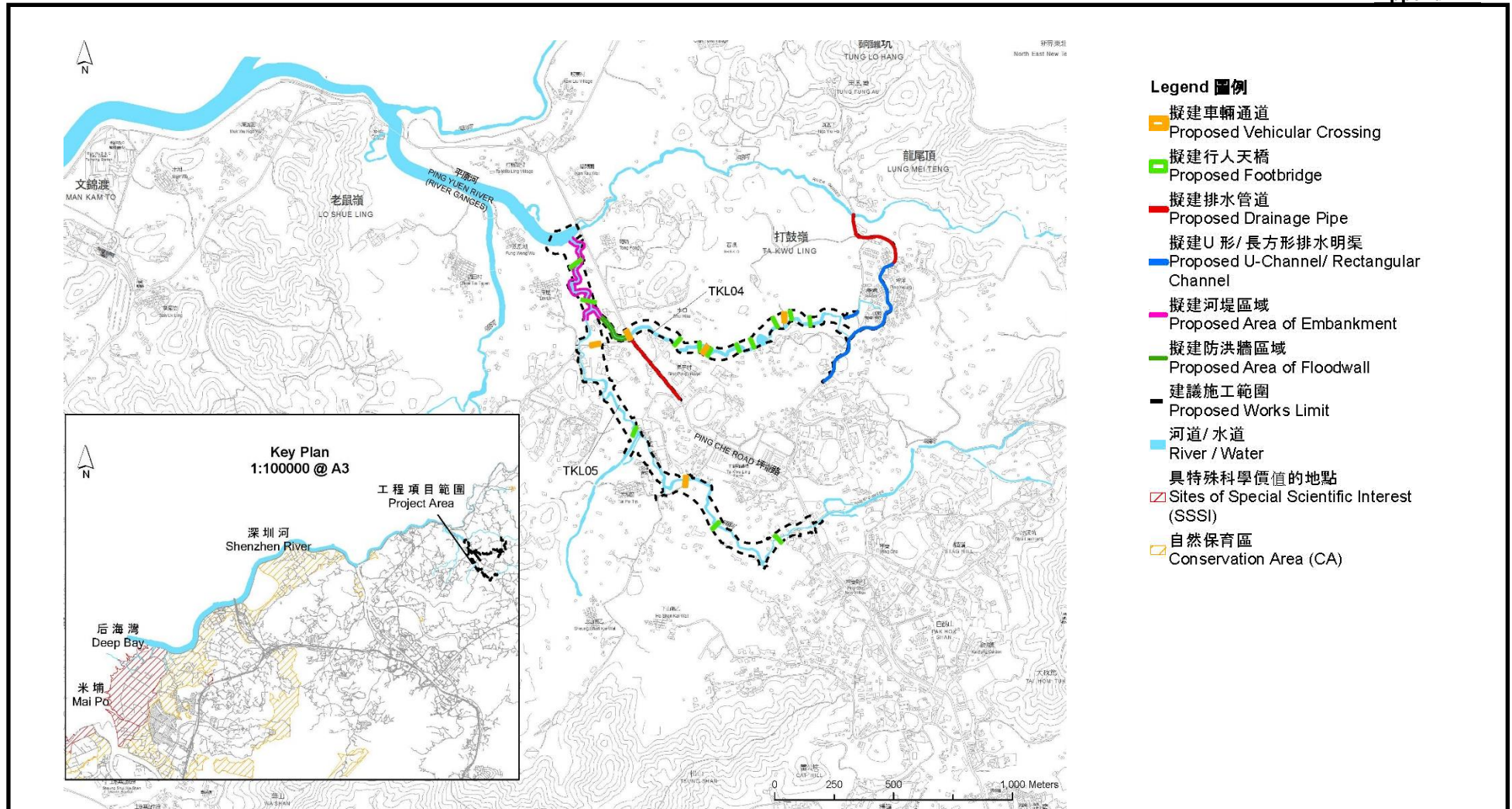
- Appendix A - Project Location Plan
- Appendix B - Requirements for Water Quality Impact Assessment
- Appendix C - Requirements for Ecological Impact Assessment
- Appendix D - Requirements for Fisheries Impact Assessment
- Appendix E - Requirements for Assessment of Waste Management Implications
- Appendix F - Requirements for Land Contamination Assessment
- Appendix G - Requirements for Landscape and Visual Impact Assessment
- Appendix H - Requirements for Air Quality Impact Assessment
- Appendix I - Requirements for Noise Impact Assessment
- Appendix J - Requirements for Cultural Heritage Impact Assessment
- Appendix K - Implementation Schedule
- Appendix L - Requirements for EIA Report Documents

- END of EIA STUDY BRIEF -

October 2019

Environmental Assessment Division
Environmental Protection Department

Appendix A



Project Title : Drainage Improvement Works in Ta Kwu Ling

(This figure is prepared based on Figure 1 of Project Profile No.: PP-588/2019)

工程項目名稱：打鼓嶺雨水排放系統改善工程

(本圖是根據工程項目簡介 PP-588/2019 圖則編號 1 編製)

EIA Study Brief No. :

環評研究概要編號： ESB-322/2019

Appendix A: Project Location Plan

附錄A: 工程項目位置圖



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

1. The Applicant shall identify and analyse physical, chemical and biological disruptions of the water 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.
3. The Applicant shall take into account different construction stages or sequences on water quality, including that due to discharge of storm water and surface runoff, and operational stages of the Project due to the natural process of siltation, flows and water velocity, and maintenance works in the assessment. 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) & (iii) above;
 - (v) review the specific construction methods and configurations, and operation of the Project to identify and predict the likely water quality impacts arising from the Project;
 - (vi) identify any alteration of any water courses, natural streams, meanders, ponds, wetlands; change in flow regimes of water bodies, catchment types or areas; erosion or sedimentation due to the Project and any other hydrological changes in the study area;

- (vii) identify and quantify all existing and future water pollution sources, including point discharges and non-point sources to the water systems, sewage and wastewater from the construction and operation stages and any other polluted discharge generated from the Project;
- (viii) provide an emission inventory on the quantities and characteristics of those existing and future pollution sources in the study area. Field investigation and laboratory test, shall be conducted as appropriate to fill relevant information gaps;
- (ix) predict and quantify the water quality impacts arising from those alterations and changes and pollution sources identified in (vi) to (viii) above. The prediction shall take into account and include possible different construction and operation stages of the Project;
- (x) assess the cumulative impacts due to other related concurrent and planned projects, activities or pollution sources within the study area that may have a bearing on the environmental acceptability of the Project;
- (xi) analyse the provision and adequacy of existing and planned future facilities to reduce pollution arising from the point and non-point sources identified in (vii) above;
- (xii) assess and evaluate the potential storm water and construction runoff impacts on the water system(s), respective catchments and sensitive receivers during construction stages and operational maintenance works (e.g. desilting and dredging) so as to reduce the water quality impacts to within standards, objectives and criteria established in (iv) above.
- (xiii) assess the pattern of the sediment deposition and the potential increase in turbidity and suspended solids levels in the water column due to the disturbance of sediments during dredging. The potential for release of contaminants during dredging shall be addressed using the chemical testing results derived from sediment samples collected on site and relevant historic data;
- (xiv) if major dredging work (both in the construction and operational phase) is to be carried out in the Shenzhen River, the water quality impact shall be assessed using a water quality model. In general, the impact shall be simulated over a minimal period of a spring-neap cycle in both the dry season and the wet season; the model grid size shall not be more than 50m around sensitive receivers and tributaries of the Shenzhen River. Appropriate laboratory testing such as elutriate test shall be performed. The Applicant shall propose detailed methodology for water quality impact assessment for the agreement of the Director;

- (xv) identify whether the discharge of runoff into the Shenzhen River and Inner Deep Bay during the operational phase will give rise to adverse impacts on water quality in accordance with the TM. The Applicant shall evaluate any water quality impacts, including changes in sediment erosion or deposition pattern, downstream salinity profile and effect on aquatic organisms. This assessment shall have regard for the frequency, duration, volume and flow rate of the discharge and its pollutant and sediment load;
 - (xvi) assess the effect of the brackish tidal influence from Lower Ping Yuen River, propose mitigation measures such as tidal barriers/flow management devices and evaluate the environmental benefits/dis-benefits of mitigation measures;
 - (xvii) develop effective and practicable 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. Effluent generated from the Project shall require appropriate collection, treatment and disposal in considering the stressed condition within Deep Bay catchment. Requirements to be incorporated in the Project contract document shall also be proposed;
 - (xviii) investigate and develop best management practices and mitigation measures to reduce any potential impacts arising from site, including storm water, non-point source pollution, first flush pollution and silty runoff during construction and operation as appropriate;
 - (xix) 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; and
 - (xx) derive emergency contingency plan for the construction and operational phases of the Project to contain and remove accidental spillage in short notice and to prevent or to minimise the quantities of contaminants from reaching the environmental sensitive receivers in a shortest practical time.
4. The Applicant shall evaluate the need of maintenance works (e.g. desilting/ dredging) at different operation stages of the Project. The cumulative water quality impacts arising from the maintenance works and other interfacing projects within the study area shall be assessed with reference to the frequency and rate of maintenance works required.

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

1. In the ecological impact assessment, the Applicant shall examine the flora, fauna and other components of the ecological habitats within the assessment area. The aim shall be to protect, maintain or rehabilitate the natural environment. In particular, the Project shall avoid or minimise impacts on recognised sites of conservation importance and other ecologically sensitive areas and species of conservation importance in the vicinity. The assessment shall identify and quantify as far as possible the potential ecological impacts to the natural environment and the associated wildlife groups and habitats/species arising from the Project 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, during its construction and operational phases as well as the subsequent management and maintenance of the proposals.
2. The assessment shall include the followings:
 - (i) Review the findings of relevant studies/surveys and collate all available information on the ecological characters of the assessment area;
 - (ii) Evaluate the information collected and identify any information gap relating to the assessment of potential ecological impact, and determine the ecological field surveys and investigations that are needed for an impact assessment as required in the following sections;
 - (iii) Carry out necessary field surveys of at least 6 months covering both the wet and dry seasons, and investigations to verify the information collected in (ii) above, and fill the information gaps identified and to fulfil the objectives of the EIA study. The field surveys shall cover flora, fauna and any other habitats/ species of conservation importance;
 - (iv) Establish the general ecological profile of the assessment area based on data of relevant previous studies/surveys and results of the ecological field surveys, if any, and description of the characteristics of each habitat found. The data set should be comprehensive and representative covering the variations of the wet and dry seasons, and is up to date and valid for the purpose of this assessment. Major information to be provided shall include:
 - (a) description of the physical environment, including all recognised sites of conservation importance and other ecologically sensitive areas, and assessment of whether these sites/areas will be affected by the Project or not;
 - (b) habitat maps of suitable scale (1:1000 to 1:5000) showing the types and locations of habitats and species of conservation importance in the assessment area;

- (c) ecological characteristics of each habitat type such as size, vegetation, type, species present, dominant species found, species diversity and abundance, community structure, seasonal pattern, ecological value and inter-dependence of the habitats and species, and presence of any features of ecological importance;
 - (d) representative colour photos of each habitat type and any important ecological features identified; and
 - (e) species found that are rare, endangered and/or listed under local legislation, international conventions for conservation of wildlife/habitats or red data books.
- (v) Investigate and describe the existing wildlife uses of the various habitats with special attention to those wildlife groups and habitats with conservation importance, including but not limited to:
- (a) woodland and grassland;
 - (b) natural and man-made wetland habitats including natural/ semi-natural streams, watercourses (both seasonal and non-seasonal), intertidal mudflat, mangroves, marshes, fishponds, freshwater ponds and others, and associated riparian habitats;
 - (c) Flora (e.g. *Mucuna championii*);
 - (d) Vertebrates (e.g. avifauna, mammals, herpetofauna, etc.);
 - (e) Stream fauna (including fish and arthropods);
 - (f) Macroinvertebrates (including butterflies and odonates);
 - (g) Egrettry (e.g. Ping Che Egrettry); and
 - (h) Any other habitats or species identified as having conservation importance by this study.
- (vi) Describe all recognised site of conservation importance and other ecological sensitive areas within and in the vicinity of the assessment area and assess whether these sites will be affected by the Project;
- (vii) Use suitable methodology and consider also other projects in the vicinity of the Project area reasonably likely to occur at the same time, identify and quantify as far as possible of any direct, indirect, on-site, off-site, primary, secondary and cumulative ecological impacts, such as destruction of habitats, reduction of species abundance/diversity, loss of roosting, breeding and/or feeding grounds, reduction of ecological carrying capacity, loss in ecological linkage and function, habitat fragmentation and any other possible disturbance caused by the Project, and in particular the following:
- (a) loss of habitats such as those mentioned in Section 2(v) above, and disturbance to wildlife;
 - (b) impacts arising from and/or associated with the proposed works;
 - (c) noise, glare, dust and other human disturbance to wildlife, and ecologically sensitive habitats in the vicinity such as fishponds / freshwater ponds and watercourses during construction and operational

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- phases;
 - (d) indirect ecological impacts due to changes in water quality, hydrodynamic properties, hydrology and alterations to riparian habitats, as a result of surface run-off in the watercourses, drainage channels, fishponds, freshwater ponds and other habitats mentioned in Section 2(v) above in the assessment area during construction and operational phases; and
 - (e) cumulative impacts due to other planned and committed concurrent development projects at or near the Project area.
- (viii) Evaluate the ecological impact based on the best and latest information available during the course of the EIA study, use quantitative approach as far as practicable and cover both the construction and operational phases of the Project as well as the subsequent management and maintenance requirement of the Project;
 - (ix) Recommend possible alternatives and practicable mitigation measures, such as restriction of works at specified season or time, adoption of appropriate construction methods and/or programme, reduce size of Project footprint, modification of layout and different alignment and reduced size, to avoid, minimise and/or compensate for the adverse ecological impacts identified during construction and operation of the Project,;
 - (x) Evaluate the feasibility and effectiveness of the recommended mitigation measures and define the scope, type, location, implementation arrangement, resource requirement, subsequent management and maintenance of such measures;
 - (xi) Determine and quantify as far as possible of the residual ecological impacts after implementation of the proposed mitigation measures;
 - (xii) Evaluate the significance and acceptability of the residual ecological impacts by making reference to the criteria in Annex 8 of the TM, and determine if off-site mitigation measures are necessary to mitigate the residual impacts and if affirmative, guidelines and requirements laid down in Annex 16 of the TM should be followed; and
 - (xiii) Review the need for and recommend any ecological monitoring programme required.

Appendix D**Requirements for Fisheries Impact Assessment**

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 under EIA Ordinance.
2. The assessment area shall include all areas within a distance of 500 metres from the site boundaries of the Project. This assessment area shall be extended to include other areas if they are found being impacted by the construction and/ or operation of the Project during the course of the EIA study. Special attention should be given to pond culture resources and activities as well as any water courses which serve as water sources for fish ponds.
3. Existing information regarding the assessment area shall be reviewed. Based on the review results, the assessment shall identify any data gap and determine if there is any need for field surveys to collect adequate baseline information. If field surveys are considered necessary, the assessment shall recommend appropriate methodology, duration and timing for such surveys.
4. The assessment shall cover any potential impact on capture and culture fisheries during construction and operation of the Project.
5. The fisheries impact assessment shall include the following major tasks:
 - (i) description of the physical environmental background;
 - (ii) description and quantification of the existing fisheries activities;
 - (iii) description and quantification of the existing fisheries resources;
 - (iv) identification of parameters (e.g. water quality parameters) and areas of fisheries importance;
 - (v) prediction and evaluation of any direct/indirect and on-site/off-site impacts on capture fisheries and culture fisheries. Special attention should be given to permanent loss or temporary occupation of fish ponds; deterioration of water quality in fish ponds and any surrounding water courses; hydrological disruptions and draw-down of water table; disruption or disturbance of pond culture related activities; potential impacts arising from the soil runoff into the stream courses located in the nearby areas where the dredged/excavated soils are to be stored, which may lead to fish kill and permanent damage to the aquatic ecosystem;
 - (vi) evaluation of cumulative impacts on fisheries particularly aquaculture sites and aquaculture production in the North West New Territories;
 - (vii) proposal of practicable alternatives or mitigation measures with details on justification, description of scope and programme feasibility as well as staff and financial implications including those related to subsequent management and maintenance requirements of the measures; and
 - (viii) review for the need of monitoring during construction and operational phases of the Project and, if necessary, proposal of a monitoring and audit programme.

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

The assessment of waste management implications shall cover the following:

(i) Analysis of Activities and Waste Generation

- (a) The Applicant shall identify the quantity, quality and timing of the waste arising as a result of the construction and operation activities, including any necessary maintenance works (e.g. desilting/ dredging), of the Project based on the sequence, duration, method and process of these activities, e.g. any dredged/ excavated sediment/mud, construction and demolition (C&D) materials and other wastes which would be generated during construction and operation stages.
- (b) 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.

(ii) Proposal for Waste Management

- (a) 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 maximizing waste reduction shall be separately considered;
- (b) After considering the opportunities for reducing waste generation and maximizing re-use, the types and quantities of the wastes required to be disposed of as a consequence shall be estimated and the disposal methods/options for each type of wastes shall be described in detail. The disposal methods/options recommended for each type of wastes shall take into account the result of the assessment in Section (d) below;
- (c) The EIA report shall state the transportation routings and the frequency of the trucks/vessels involved, any barging point or conveyor system to be used, the stockpiling areas and the disposal outlets for the wastes identified; and
- (d) The impact caused by handling (including stockpiling, labelling, packaging & storage), collection, transportation and re-use/disposal of wastes shall be addressed in detail and appropriate mitigation measures shall be proposed. This assessment shall cover the following areas:
 - potential hazard;
 - air and odour emission;
 - noise;
 - wastewater discharge;

- ecology; and
- public transport.

(iii) Excavation/Dredging and Dumping

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

Appendix F**Requirements for Land Contamination Assessment**

1. The Applicant shall identify the potential land contamination site(s) within the Project Area (Appendix A refers) and, if any, within the boundaries of associated areas (e.g. works areas) of the Project.
2. The Applicant shall provide a clear and detailed account of the present land use (including description of the activities, chemicals and hazardous substances handled, with clear indication of their storage and location, by reference to a site layout plan) and a complete past land uses history, in chronological order, in relation to possible land contamination (including accident records and change of land use(s) and the like).
3. If any contaminated land uses as stated in Sections 3.1 and 3.2 of Annex 19 in the TM is identified, the Applicant shall carry out the land contamination assessment as detailed from sub-section (i) to (iii) below and propose measure to avoid disposal -:
 - (i) During the course of the EIA study, the Applicant shall submit a Contamination Assessment Plan (CAP) to the Director for endorsement prior to conducting an actual contamination impact assessment of the land or site(s). The CAP shall include proposal with details on representative sampling and analysis required to determine the nature and the extent of the contamination of the land or site(s). Alternatively, the Applicant may refer to other previously agreed and still relevant and valid CAP(s) for the concerned site(s).
 - (ii) Based on the endorsed CAP, the Applicant shall conduct a land contamination impact assessment and submit a Contamination Assessment Report (CAR) to the Director for endorsement. If land contamination is confirmed, a Remediation Action Plan (RAP) to formulate viable remedial measures with supporting documents, such as agreement by the relevant facilities management authorities, shall be submitted to the Director for approval. The Applicant shall then clean up the contaminated land or site(s) according to the approved RAP, and a Remediation Report (RR) to demonstrate adequate clean-up should be prepared and submitted to the Director for endorsement prior to the commencement of any development or redevelopment works within the Project Area. The CAP, CAR and RAP shall be documented in the EIA report.
 - (iii) If there are potential contaminated sites which are inaccessible for

conducting sampling and analysis during the course of the EIA study, e.g. due to site access problem, the Applicant's CAP shall include:

- (a) a review of the available and relevant information;
- (b) an initial contamination evaluation of these sites and possible remediation methods;
- (c) a confirmation of whether the contamination problem at these sites would be surmountable;
- (d) a sampling and analysis proposal which shall aim at determining the nature and the extent of the contamination of these sites ; and
- (e) where appropriate, a schedule of submission of revised or supplementary CAP, CAR, RAP and RR as soon as these sites become accessible.

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

1. The Applicant shall review relevant plan(s) and/or studies which may identify areas of high landscape value and recommend country park, coastal protection area, green belt, conservation area designations, watercourses and woodland areas. Any guidelines on landscape and urban design strategies and frameworks that may affect the appreciation of the Project shall also be reviewed. The aim is to gain an insight to the future outlook of the area affected so as to assess whether the Project can fit into the surrounding setting. Any conflict with the statutory town plan(s) and any published land use plans shall be highlighted and appropriate follow-up action shall be recommended. A system shall be derived for judging the landscape and visual impact significance as required under the Annexes 10 and 18 of the TM. Cumulative landscape and visual impacts of the Project with other existing, committed and planned developments in the assessment area shall be assessed.
2. The Applicant shall describe, appraise, analyse and evaluate the existing and planned landscape resources and character of the assessment area. A system shall be derived for judging landscape and visual impact significance. Annotated oblique aerial photographs and plans of suitable scale showing the baseline landscape character areas and landscape resources and mapping of impact assessment shall be extensively used to present the findings of impact assessment. Descriptive text shall provide a concise and reasoned judgment from a landscape and visual point of view. The sensitivity of the landscape framework and its ability to accommodate change shall be particularly focused on. The Applicant shall identify the degree of compatibility of the Project with the existing and planned landscape setting, recreation and tourism related uses, and scenic spot. The landscape impact assessment shall quantify the potential landscape impact as far as possible so as to illustrate the significance of such impacts arising from the proposed development. Clear mapping of the landscape impact is required. Broad brush tree and vegetation survey shall be carried out and the impacts on existing trees and vegetation shall be addressed. Cumulative landscape and visual impacts of the Project with other committed and planned developments shall be assessed.
3. The Applicant shall assess the visual impacts of the Project. Clear illustration including mapping of visual impact is required. The assessment shall include the following:
 - (i) identification and plotting of visual envelope of the Project;
 - (ii) appraisal of existing visual resources and character as well as the future outlook of the visual system of the assessment area;

- (iii) identification and justification of the key groups of existing and planned sensitive receivers within the visual envelope with regard to views from ground level, sea level and elevated vantage points, and clearly indicate the sensitive receivers on a plan of appropriate scale;
 - (iv) description of the visual compatibility of the Project with the surrounding and the planned setting, its obstruction and interference with the key views of the study areas, and changes in visual amenity;
 - (v) identification and description of the severity of visual impacts in terms of distance, nature and number of sensitive receivers. The glare impact of the Project shall be considered in the assessment. Assessment on effectiveness of the proposed mitigation measures of visual impacts during construction and operation stages shall be carried out by comparing the impacts with and without mitigation measures; and
 - (vi) evaluation and explanation with supportive arguments of factors considered in arriving the significance thresholds of visual impact. The visual impacts should include presentation of an evaluation matrix derived for judging impact significance.
4. In evaluation of the potential glare impact due to man-made light sources generated from the Project and associated works and recommending practicable mitigation measures, reference could be made to “Charter on External Lighting” and “Guidelines on Industry Best Practices for External Lighting Installations” promulgated by the Environment Bureau.
5. The Applicant shall evaluate the merits of preservation in totality, in parts or total destruction of existing landscape and the establishment of a new landscape character area. In addition, alternative location, layout, design, built-form and construction method that will avoid or reduce the identified landscape and visual impacts shall be evaluated for comparison before adopting other mitigation or compensatory measures to alleviate the impacts. The mitigation measures proposed shall not only be concerned with damage reduction but shall also include consideration of potential enhancement of existing landscape and visual quality. The Applicant shall recommend mitigation measures to minimise adverse effects identified above, including provision of a master landscape plan illustrating the landscape design and mitigation measures.
6. The mitigation measures shall also include the preservation of vegetation and natural landscape resources, e.g. transplanting trees in good condition and value, provision of screen planting, re-vegetation of disturbed lands, compensatory planting, woodland

restoration, peripheral landscape treatment to blend in with the surrounding environment, design of structures, provision of finishes to structure, colour scheme and texture of material used and any measures to mitigate the impact on the existing and planned land use and visually sensitive receivers. Parties shall be identified for the ongoing management and maintenance of the proposed mitigation works to ensure their effectiveness throughout the construction phase and operational phase of the Project, associated works, supporting facilities and essential infrastructures. A practical programme and funding proposal for the implementation, management and maintenance of the recommendation measures shall be provided.

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

Appendix H

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 study area for the purpose of evaluating cumulative air quality impacts during construction and operation stages of the Project. If the PATH model is used to estimate the future background air quality, details for the estimation of all emission sources to be adopted in the model runs should be clearly presented.

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

- (i) Identification and description of existing, committed and planned ASRs that would likely be affected by the Project, including those earmarked on the relevant Outline Zoning Plans, Development Permission Area Plans, Outline Development Plans and Layout Plans and other relevant published land use plans, including plans and drawings published by Lands Department and any land use and development applications approved by the Town Planning Board. The Applicant shall select the assessment points of the identified ASRs that represent the worst impact point of these ASRs. A map clearly showing the location and description such as name of buildings, their uses and height of the selected assessment points shall be given. The separation distances of these ASRs from the nearest emission sources shall also be given.
- (ii) Provision of a list of air pollution emission sources, including any nearby emission sources which are likely to have impact related to the Project based on the analysis of the construction and operation activities in Section 1 above. Confirmation regarding the validity of the assumptions adopted and the magnitude of the activities (e.g. volume of construction materials to be handled and volume of dredging materials handled etc.) shall be obtained from the relevant government departments/authorities, where applicable, and documented in the EIA report.
- (iii) Identification of existing and potential chimneys and obtainment of relevant chimney emission data in the assessment area, where appropriate, by carrying out a survey for assessing the cumulative air quality impact of air pollutants through chimneys. The Applicant shall ensure and confirm the validity of the emission data

used in their assessment. Any errors found in their emission data used may render the submission invalid.

- (iv) The emissions from any concurrent projects identified as relevant during the course of the EIA study shall be taken into account as contributing towards the overall cumulative air quality impact. The impact as affecting the existing, committed and planned ASRs within the study area shall be assessed, based on the best information available at the time of assessment.

3. Construction Phase Air Quality Impact

- (i) The Applicant shall follow the requirements stipulated under the Air Pollution Control (Construction Dust) Regulation to ensure that construction dust impacts are controlled within the relevant standards as stipulated in Section 1 of Annex 4 of the TM.
- (ii) If the Applicant anticipates that the Project will give rise to significant construction dust impacts likely to exceed recommended limits in the TM at the ASRs despite the incorporation of the dust control measures proposed, a quantitative assessment shall be carried out to evaluate the construction dust impact at the identified ASRs. The Applicant shall follow the methodology set out in Section 5 below when carrying out the quantitative assessment.
- (iii) Where necessary, the Applicant shall consider and evaluate direct mitigation measures, including 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 describe the means of transportation and their routings involved, with a view to addressing potential dust nuisance caused by transportation activities. Any mitigation measures recommended for fugitive dust control should be well documented in the EIA report.
- (iv) The Applicant shall consider the odour impact that may arise from the construction and associated activities of the Project and propose suitable measures to control/minimise the odour problem, if any, arising from dredging/ removal of sediments and associated works.
- (v) 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 and odour emission.

4. Operational Phase Air Quality Impact

- (i) The Applicant shall assess the expected air quality impact at the identified ASRs based on an assumed reasonably worst case scenario under normal operating condition. If the assessment indicates likely exceedances of the recommended limits in the TM at the ASRs, a quantitative assessment should be carried out to evaluate the operational phase air quality impacts at the identified ASRs. The Applicant shall follow the methodology set out in Section 5 below when carrying out the quantitative assessment;
- (ii) A monitoring and audit programme for the operational stage shall be devised to

verify the effectiveness of the control measures proposed so as to ensure proper operational odour control.

5. Quantitative Assessment Methodology

- (i) The Applicant shall conduct the quantitative assessment by applying the general principles enunciated in the modelling guidelines in Appendix H-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 the 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 averaging time concentrations) to be evaluated and provide explanation for selecting such parameters for assessing the impact from the Project.
- (iii) Detailed calculations of air pollutant emission rates for input to the model showing road links and emission sources shall be presented in the EIA report. A summary table of the emission rates shall be presented in the EIA report. The Applicant must ensure consistency between the text description and the model files at every stage of submissions for review.
- (iv) The air pollution impacts of future road traffic shall be calculated based on the highest emission strength from the road vehicles in the assessment area within the next 15 years upon commissioning of the Project. The Applicant shall demonstrate that the selected year of assessment represents the highest emission scenario given the combination of vehicular emission factors and traffic flow for the selected year. The Applicant may use EMFAC-HK model released by the Director to determine the Fleet Average Emission Factors, taking into account vehicle fleet mix and other necessary data. Unless otherwise agreed by the Director, the latest version of the EMFAC-HK model shall be used. Use of any alternatives to the EMFAC-HK model shall be agreed with the Director. The traffic flow data and assumptions, such as the exhaust technology fractions, vehicle age/population distribution, traffic forecast and speed fractions, that are used in the assessment shall be presented.
- (v) For estimating the future background air quality, the Applicant may use the PATH model released by the Director, taking into consideration the major air pollutant emission sources projected for Hong Kong and nearby regions. Unless otherwise agreed by the Director, the latest version of the PATH model shall be used. Use of any alternatives to the PATH model shall be agreed with the Director. Details of the adopted emission sources should be presented.
- (vi) Ozone Limiting Method (OLM) or Discrete Parcel Method (DPM) or other appropriate method shall be used to estimate the conversion ratio of NO_x to NO₂ if NO₂ has been identified as a key/representative air pollutant.
- (vii) The Applicant shall calculate the overall cumulative air quality impact at the ASRs identified under Section 2 above and compare these results against the criteria set

out in Section 1 of Annex 4 in the TM. The predicted air quality impacts (both unmitigated and mitigated) shall be presented in the form of summary table(s) and pollution contours, to be evaluated against the relevant air quality standards and on any effect they may have on the land use implications. Plans of a suitable scale should be used to present pollution contours to allow buffer distance requirements to be determined properly.

6. Mitigation Measures for Air Quality Impact

Consideration for Mitigation Measures

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

Evaluation of Residual Air Quality Impact

- (ii) Upon consideration of mitigation measures, if the mitigated air quality impact still exceeds the relevant criteria in Annex 4 of the TM, the Applicant shall identify, predict, and evaluate the residual air quality impact in accordance with Section 4.4.3 and Section 4.5.1(d) of the TM.

7. Submission of Emission Calculation Details and Model Files

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

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

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

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

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

- i) Guidelines on Choice of Models and Model Parameters (Revised);
- ii) Guidelines on Assessing the "Total" Air Quality Impacts (Revised);
- iii) Guidelines on the Use of Alternative Computer Models in Air Quality Assessment;
- iv) Guidelines on the Estimation of PM_{2.5} for Air Quality Assessment in Hong Kong; and
- v) Guidelines on the Estimation of 10-minute Average SO₂ Concentration for Air Quality Assessment in Hong Kong.

Appendix I

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 Should quantitative noise impact assessment be required to evaluate the noise impact during operation of the Project, the Applicant shall conduct prevailing background noise surveys to determine the standards for evaluating noise impact from fixed noise source. The respective noise environment should be documented in the EIA report.
- 1.3 The Applicant shall consider and compare the noise environment with respect to the benefits and dis-benefits of various scenarios with or without the Project.

2. Construction Noise Impact Assessment

2.1 Construction Noise Impact Assessment Methodology

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

2.2 Identification of Construction Noise Impact

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

- (a) 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 refer to Annex 13 of the TM when identifying the NSRs. The NSRs shall include existing NSRs and planned/committed noise sensitive developments and uses earmarked on the relevant Outline Zoning Plans, Development Permission Area Plans, Outline Development Plans, Layout Plans and other relevant published land use plans, including plans and drawings published by the Lands Department and any land use and development applications approved by the Town Planning Board. Photographs of existing NSRs shall be appended to the EIA report.
- (c) The Applicant shall identify all NSRs in the assessment area and select assessment points to represent identified NSRs for carrying out quantitative construction noise impact assessment as described below.
- (d) 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.
- (e) A map showing the location and description such as name of building, use, and height of each and every selected assessment point shall be given. For planned noise sensitive land uses without committed site layouts, the Applicant should use the relevant planning parameters to work out representative site layouts for noise

assessment purpose. However, such assumptions together with any constraints identified, such as setback of building, building orientation, extended podium, shall be agreed by the relevant responsible parties including the Planning Department and the Lands Department in accordance with Section 6.3 of Annex 13 of the TM.

2.2.2 *Inventory of Noise Sources*

The Applicant shall identify and quantify an inventory of noise sources for representative construction equipment for the purpose of construction noise impact assessment. Confirmation on the validity of the inventory shall be obtained from relevant authorities/qualified personnel and documented in the EIA report.

2.3 Prediction and Evaluation of Construction Noise Impact

2.3.1 *Phases of Construction*

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

2.3.2 *Scenarios*

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

2.3.3 *Prediction of Noise Impact*

- (a) The Applicant shall present the predicted noise levels in Leq (30 min) dB(A) at the selected assessment points on tables and plans of suitable scale.
- (b) The assessment shall cover the cumulative construction noise impact resulting from the construction works of the Project and other concurrent projects identified during the course of the EIA study on identified NSRs within the assessment area.
- (c) The potential construction noise impact under different phases of construction shall be quantified by estimating the total number of dwellings and other noise sensitive receivers that will be exposed to noise impact exceeding the criteria set in Annex 5 in the TM.
- (d) The Applicant shall, as far as practicable, formulate a reasonable construction programme so that no work will be required in restricted hours as defined under the Noise Control Ordinance (NCO). In case the Applicant needs to evaluate whether construction works in restricted hours as defined under the NCO are feasible or not in the context of programming construction works, reference should be made to relevant technical memoranda issued under the NCO. Regardless of the results of construction noise impact assessment for restricted hours, the Noise Control Authority will process Construction Noise Permit (CNP) application, if necessary, based on the NCO, the relevant technical memoranda issued under the NCO, and the contemporary conditions/situations. This aspect should be explicitly stated in the noise chapter and the conclusions and recommendations chapter in EIA report.

2.4 Mitigation of Construction Noise Impact

2.4.1 *Direct Mitigation Measures*

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

2.5 Evaluation of Residual Construction Noise Impact

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

3. Fixed Noise Source Impact Assessment

3.1 Fixed Noise Source Impact Assessment Methodology

If maintenance works are required during the operational phase, the Applicant shall carry out fixed noise sources impact assessment from the Project in accordance with the methodology in paragraph 5.2 of Annex 13 of the TM.

3.2 Identification of Fixed Noise Source Impact

3.2.1 *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 impact shall generally include areas within 300 metres from the boundary of the Project and the works of the Project.
- (b) The Applicant shall identify all existing, committed and planned NSRs in the assessment area and select assessment points to represent identified NSRs for carrying out fixed noise source impact assessment described below.
- (c) The assessment points shall be confirmed with the Director prior to the commencement of the quantitative fixed noise source impact assessment and may be varied subject to the best and latest information available during the course of the EIA study.
- (d) A map showing the location and description such as name of building, use, and floor of each and every selected assessment point shall be given. Photographs of existing NSRs shall be appended to the EIA report.
- (e) For planned noise sensitive land uses without committed site layouts, the Applicant should use the relevant land use and planning parameters and conditions to work out representative site layouts for fixed noise source impact assessment purpose. However, such parameters and conditions together with the representative site

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 identify and quantify an inventory of noise sources for fixed noise source impact assessment. The inventory of noise sources shall include, but not limited to noise associated with any permanent and temporary industrial noise sources.
- (b) The Applicant shall provide document or certificate, 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 and documented in the EIA report.

3.3 Prediction and Evaluation of Fixed Noise Source Impact

3.3.1 *Scenarios*

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

3.3.2 *Prediction of Noise Impact*

- (a) The Applicant shall present the predicted noise levels in Leq (30 min) dB(A) at the selected assessment points at various representative floor levels (in m P.D.) on tables and plans of suitable scale.
- (b) The assessment shall cover the cumulative fixed noise source impact associated with the operation of the Project on existing, committed and planned NSRs within the assessment area.
- (c) The potential fixed noise source impact under different scenarios shall be quantified by estimating the total number of dwellings 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 Fixed Noise Source Impact

3.4.1 *Direct Mitigation Measures*

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

be well documented in the report. Specific reasons for not adopting certain direct mitigation measures to reduce the noise to a level meeting the criteria in the TM or to maximise the protection for the NSRs as far as possible should be clearly substantiated and documented in the EIA report.

3.5 Evaluation of Residual Fixed Noise Source Impact

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

Appendix J

Requirements for Cultural Heritage Impact Assessment

1. The Applicant shall conduct a built heritage impact assessment (BHIA), taking the results of the previous studies and other background of the site into account, to identify known and unknown built heritage items within the assessment area that may be affected by the Project and its associated works and to assess the direct and indirect impacts on built heritage items. The impacts include visual impact, impacts on the fung shui/visual corridor of the historic buildings and structures through change of water-table, vibration caused by the Project. Assessment of impacts on cultural heritage shall also take full account of, and allow where appropriate, the Guidelines for Landscape and Visual Impact Assessment of Annex 18 of the TM. The Applicant shall demonstrate that all reasonable efforts have been made to avoid or keep the adverse impacts of built heritage items to the minimum through modification of design of the Project, or use of latest construction / engineering techniques. For those built heritage items that might still be directly and indirectly affected by the Project, the Applicant shall recommend practicable mitigation measures and monitoring to avoid or keep the adverse impact to the minimum. A checklist including all the affected sites of cultural heritage, impacts identified, recommended mitigation measures as well as the implementation agent and period shall also be included in the EIA report.
2. 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 baseline study consisting of desk-top research and field evaluation (if found necessary), shall be submitted to the Director prior to the commencement of the assessment for consideration. In case the existing information is inadequate or where the assessment area has not been adequately studied before, the archaeologists shall conduct archaeological field investigations to assemble data. The archaeologists shall obtain licences from the Antiquities Authority prior to the commencement of archaeological field investigations. 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 field investigation is required, it shall follow detailed technical requirements to be given by the Director on archaeological survey, archaeological report and handling of archaeological finds and archives.
3. The Applicant shall draw necessary reference to relevant sections of the “Guidelines for Cultural Heritage Impact Assessment” issued by the Antiquities and Monuments Office for detailed requirement.

Appendix L

Requirements for EIA Report Documents

1. The Applicant shall supply the Director with the following number of copies of the EIA report and the executive summary:
 - (i) 30 copies of the EIA report and 30 copies of the bilingual (in both English and Chinese) executive summary as required under Section 6(2) of the EIAO to be supplied at the time of application for approval of the EIA report.
 - (ii) When necessary, addendum to the EIA report and the executive summary submitted in item (i) above as required under Section 7(1) of the EIAO, to be supplied upon advice by the Director for public inspection.
 - (iii) 20 copies of the EIA report and 50 copies of the bilingual (in both English and Chinese) executive summary with or without Addendum as required under Section 7(5) of the EIAO, to be supplied upon advice by the Director for consultation with the Advisory Council on the Environment.
2. To facilitate public inspection of EIA report via EIAO Internet Website, the Applicant shall provide electronic copies of both the EIA report and the executive summary prepared in HyperText Markup Language (HTML) and in Portable Document Format (PDF), unless otherwise agreed by the Director. For both of the HTML and PDF versions, a content page capable of providing hyperlink to each section and sub-section of the EIA report and the executive summary shall be included in the beginning of the document. Hyperlinks to figures, drawings and tables in the EIA report and the executive summary shall be provided in the main text from where respective references are made. The EIA report, including drawings, tables, figures and appendices shall be viewable by common web-browsers including Internet Explorer 8, Firefox 23, Chrome and Safari 8 or later versions as agreed by the Director, and support languages including Traditional Chinese, Simplified Chinese and English.
3. The electronic copies of the EIA report and the executive summary shall be submitted to the Director at the time of application for approval of the EIA report.
4. When the EIA report and the executive summary are made available for public inspection under Section 7(1) of the EIAO, the content of the electronic copies of the EIA report and the executive summary must be the same as the hard copies and the Director shall be provided with the most updated electronic copies.
5. To promote environmentally friendly and efficient dissemination of information, both hardcopies and electronic copies of future EM&A reports recommended by the EIA study shall be required and their format shall be agreed by the Director.